RARAKAU RAINFOREST CARBON PROJECT

PROJECT DESCRIPTION: D3.P1.1 V2.0, 2018

An Improved Forest Management Carbon Project Undertaken on Pre-1990 Indigenous Forest Land at Rarakau, Southland, New Zealand

carbonpartnership

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INVESTING IN NATURE

October 2018

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Project Description: D3.P1.1 v2.0, 20181009

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October 2018

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ABOUT EKOS

A not-for-profit carbon management service provider, specialising indigenous forest carbon and zero carbon certification. We also work in environmental markets including indigenous forest carbon and sustainable land management (project development, policy and financing consulting.

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Executive Summary

This document contains the Project Description (PD) for the Rarakau Rainforest Carbon Project – the Inception Project (first project activity instance) of the Grouped Project called the 'Rarakau Programme,' validated to the Plan Vivo Standard.

The table below presents the Programme Idea Note for the Rarakau Rainforest Carbon Project.

Rarakau Rainforest Carbon Project PIN	
Grouped Project	Rarakau Programme
Methodology	Rarakau Programme Methodology D2.1 v2.0, 15 May 2018
Scope	Baseline and project activities encompass forest-remaining-as-forest activities. Accounting for LULUCF emissions and removals.
Standard	Plan Vivo
Registry	Markit Environmental Registry
Product	Ex post Plan Vivo Certificates issued as VERs. Issued by Markit Registry. Owned by Project Owner.
Benefits	Avoided LULUCF emissions from avoided timber harvesting; enhanced removals from forest protection.
Co-Benefits	• New Zealand indigenous biodiversity benefits arising from the protection of indigenous forests in the Project Activity (New Zealand is a biodiversity hot-spot particularly for forest birds) • Maori cultural benefits arising from the retention of indigenous forest cultural resources for Maori owners of the Project Area forests.
Validator/verifier	Misheck Kapambwe
Project Period	50 years from 1 January 2009 to 31 December 2058 but with an indefinite option to roll over for subsequent Project Periods.
Crediting Period/ Monitoring Period	5 yearly starting 1 January 2009
Activity Type	Improved Forest Management – Logged to Protected Forest (IFM-LtPF) in New Zealand indigenous forest.
Project Name	Rarakau Rainforest Carbon Project
Status in Grouped Project	Inception Project
Project Owner	Rowallan Alton Incorporation
Project Developer	Carbon Partnership Limited
Programme Operator	Ekos
Project Location	Te Waewae Bay, Western Southland, New Zealand.

Project Area	1,367 ha made up of 11 land parcels
Forest Area	738 ha made up of 11 land parcels
Eligible Forest Area	738 ha made up of 11 land parcels
Original condition	Logged forest
Baseline Activity	Legally sanctioned timber harvesting
Project Activity	Forest protection by means of a legal covenant for duration of Project Period.
Legal Protection	Memorandum of Encumbrance under the Property Law Act 2007. The legal protection applies for the duration of the Project Period.
Co-Benefits	• Community co-benefits derived from project consultation protocol. Not quality assured under a separate standard but with option to do so in future. • Biodiversity co-benefits derived from protecting indigenous forest ecosystems. Not quality assured under a separate standard but with option to do so in future.
Validation	• Plan Vivo Standard
Verification	• GHG assertion verified under the Plan Vivo Standard
Net Carbon Benefits	3,072 tCO2 per annum starting 1 January 2009
Buffer	20% of Net Carbon Benefits: 614 credits p.a. deposited into pooled buffer account starting 1 January 2009.
Owner/manager of pooled buffer account	Ekos
Net Carbon Credits	2,458 ex post VERs annually

Introduction

RARAKAU PROGRAMME

The Rarakau Programme is a Grouped Project (programme of activities) based on an 'Improved Forest Management – Logged to Protected Forest' (IFM-LtPF) methodology and applicable only to lands conforming to Article 3.4 of the Kyoto Protocol. New Zealand elected to not undertake Article 3.4 of the Kyoto Protocol and as such, the LULUCF baseline and project activities of the Rarakau Programme (forests-remaining-as-forest activity) are located outside the GHG accounting boundary of the Kyoto Protocol (non-Kyoto forest). Project activities in the Rarakau Programme therefore, are ineligible for carbon crediting under any international or domestic compliance carbon-financing instrument or GHG accounting regime.

The Rarakau Programme is validated to the Plan Vivo Standard. Grouped Projects are projects structured to allow the expansion of a project activity subsequent to project validation. Validation is based upon the initial project activity instances identified in the project description. The project description sets out the geographic areas within which new project activity instances may be developed and the eligibility criteria for their inclusion. New instances meeting these pre-established criteria may then be added to the project subsequent to project validation.

The title of the Rarakau Programme is taken from the title of the first activity instance (Inception Project) of this Grouped Project – the Rarakau Rainforest Carbon Project. 'Rarakau' is the customary name for the land contained in the Inception Project.

The purpose of the Rarakau Rainforest Carbon Project is to enable the Rowallan Alton Incorporation to benefit from carbon trading opportunities for forest protection through the international voluntary carbon market.

Rarakau Rainforest Carbon Project

Carbon Partnership Ltd is the Project Developer for the Rarakau Rainforest Carbon Project; the Rowallan Alton Incorporation is the Project Owner, and Ekos is the Programme Operator. The Rowallan Alton Incorporation a Maori incorporation comprising an aggregation of Maori land in Southland, New Zealand. The purpose of the Rarakau Rainforest Carbon Project is to enable the Rowallan Alton Incorporation to create and sell carbon credits instead of timber from indigenous forest resource. This enables the Rowallan Alton Incorporation to manage their indigenous forests for conservation and cultural purposes. The Rarakau Rainforest Carbon Project is co-managed by the Rowallan Alton Incorporation and Carbon Partnership Ltd. The intention of the Rowallan Alton Incorporation to undertake a carbon project to protect their forests was formalised in 2008, although at that time the carbon project had only been scoped at a broad level. The ensuing collaboration between the Rowallan Alton

Incorporation, Te Puni Kokiri, Carbon Partnership and Ekos led to the development of the Rarakau Programme and the Rarakau Rainforest Carbon Project.

The PD for the Rarakau Rainforest Carbon Project is contained in this document. Subsequent project activity instances within the Grouped Project (called 'Sub-Projects' in the Rarakau Programme) are projects that replicate the methodology and eligibility criteria of the Rarakau Rainforest Carbon Project but with different geographical location and associated project data (i.e. different projects on different lands with different Project Owners) and with different project titles. The geographical boundary of the Grouped Project initiated in this document is defined as 'New Zealand forest land that meets the eligibility criteria of the Rarakau Programme Methodology D2.v2.0, 15 May 2018.'

Methodology

The methodology used for this PD is the Rarakau Programme Methodology D2 v2.0, 15 May 2018. This is an Improved Forest Management – Logged to Protected Forest (IFM-LtPF) Grouped Project methodology.

DOCUMENT STRUCTURE

This document contains a Project Description (PD) for the Rarakau Rainforest Carbon Project – the initial project activity instance that launches this Grouped Project.

Evidence requirements are presented in tables with green headings:

Evidence Requirement		
#	Name/Description	Location

1. General Requirements

1.1 ELIGIBILITY

The forests in the Rarakau Rainforest Carbon Project comprise an aggregation of land parcels within which the eligible forest areas are composed of "pre-1990 forest", having been classified as 'forest land' as of and prior to 31 December 1989 and where the baseline and project activities are forest-remaining-as-forest activities.

Table 1.1 Evidence Requirement: Eligibility

#	Name/Description	Location
1.1a	Eligibility for voluntary carbon market	Evidence for the eligibility of this project to be undertaken as a forest carbon project under the Plan Vivo standard is provided in the form of aerial imagery and maps presented in Section 2.3.5 of this document. This evidence demonstrates that the Eligible Forest Area is comprised of 'pre-1990 indigenous forest' and therefore lies outside the carbon accounting boundary of the New Zealand Emissions Trading Scheme.
1.1b	Eligibility for Plan Vivo Standard	The eligibility for this project in terms of the Plan Vivo Standard is presented in Section 1.1 of this document.

1.1.1 Forest Land

The Rarakau Rainforest Carbon Project is undertaken on forest lands that meet the eligibility criteria of Section 1.1.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

Table 1.1.1 Evidence Requirement: Forest Land

#	Description	Location
1.1.1a	Aerial imagery demonstrating that the eligible forest area was established prior to 1990.	Section 2.3.5
1.1.1b	Aerial imagery and maps that differentiate between unlogged and logged forest strata.	Section 2.3.5
1.1.1c	Documentation demonstrating that any current commercial wood harvesting operation began prior to 31 December 2009.	n/a

1.1.2 Baseline Activity

The Baseline Activity for the Rarakau Rainforest Carbon Project is undertaken on forest land that meets the eligibility criteria of Section 1.1.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. Evidence to support this assertion of eligibility is described in Table 1.1.2 below.

Table 1.1.2. Evidence Requirement: Baseline Activity		
#	Description	Location
1.1.2a	Documentation demonstrating that the Eligible Forest Area for the carbon project is eligible for baseline activities of commercial wood harvesting according to national and local government law and regulation. This documentation will include evidence that the central government and local government regulations (in principle) allow for the baseline activity to occur.	Appendices 1 and 2.
1.1.2b	Documentation demonstrating that the Eligible Forest Area for the carbon project contains commercially viable wood volumes capable of supporting a commercial wood harvesting operation. This information is to be provided in a timber harvesting plan in the form of a Sustainable Forest Management Plan or Permit Application, in combination with a financial additionality test undertaken as part of this methodology.	Appendix 3

1.1.3 Project Activity

The Project Activity for the Rarakau Rainforest Carbon Project is undertaken on forest lands that meet the eligibility criteria of Section 1.1.3 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. Evidence to support this assertion of eligibility is described in Table 1.1.3 below.

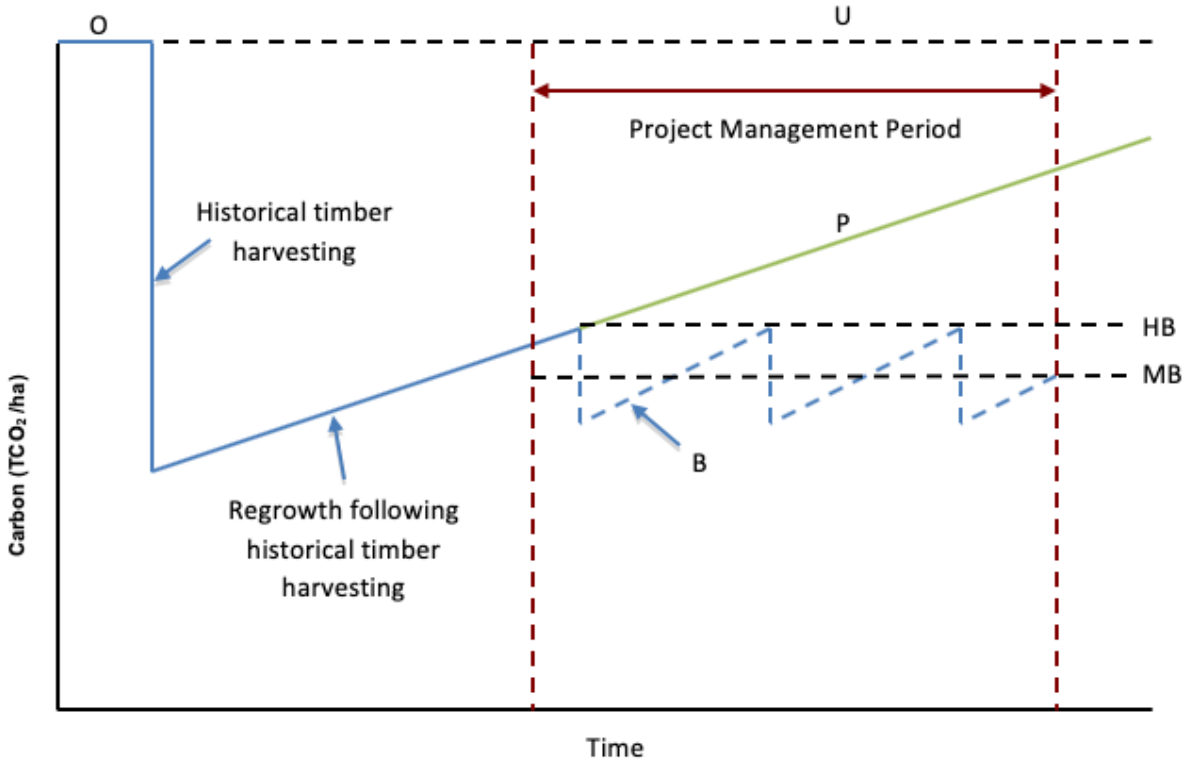
Table 1.1.3: Evidence Requirement: Project Activity		
#	Description	Location
1.1.3a	A legal covenant to be placed on the land title within 3 months of successful validation (Inception Project) / verification (Sub-Projects).	Appendix 16

A memorandum of Encumbrance was lodged against the land title at first verification.

1.1.4 Logged and Unlogged

The Rarakau Rainforest Carbon Project uses two strata as defined in Section 1.1.4 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018: Non-Forest, and Regenerating Forest. The concept diagram for the baseline and project activities in the Rarakau Forest Carbon is presented in Figure 1.1.4. Evidence to support this assertion of eligibility is described in Table 1.1.4 below.

Figure 1.1.4. Concept diagram of avoided timber harvesting project type starting with a regenerating forest.



Key:
- O = Original mean carbon stocks in old growth undisturbed forest
- B = Reference Scenario carbon stocks under timber harvesting regime (harvest/regrowth)
- P = Project Scenario carbon stocks under forest protection regime (approaches asymptote U)
- HB = Harvest Baseline carbon stocks at start of Reference Scenario
- MB = Mean Reference carbon stocks under harvest regime
- U = Upper limit of future mean carbon stocks

Table 1.1.4. Evidence Requirement: Logged and Unlogged Forest		
#	Name/Description	PD Location
1.1.4a	Aerial imagery delimiting three strata as follows: (a) Non-forest land; (b) Regenerating forest land, and (c) Old growth forest land (n/a for this project)	Section 2.3.5 Aerial imagery data available on request
1.1.4b	Aerial imagery-based area calculation for the three strata defined in 1.1.4a.	Section 2.3.5 Appendix 6

1.1.5 Specific Conditions

The Rarakau Rainforest Carbon Project meets all of the eligibility criteria described in Section 1.1.5 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018, with evidence provided in Table 1.1.5 below.

Table 1.1.5. Evidence Requirement: Specific Conditions		
#	Description	Location
1.1.5a	Project Owner exists as a legal entity capable of acting as a counter party to a sale and purchase agreement and capable of owning carbon credit assets.	Appendix 7 and 8
1.1.5b	Project Owner owns the carbon rights and management rights over the forest lands in the project area.	Appendix 7 and 8
1.1.5c	Current and planned land use: land must be legally eligible to be harvested for commercial timber or fuelwood production.	Appendix 1, 2, and 3
1.1.5d	Forest lands eligible for crediting under this programme will only include lands that have not received financing for the same project activities from another source.	Appendix 17
1.1.5e	The boundaries of the forest land must be clearly defined and documented.	Section 2.3.5
1.1.5f	Under the Project Scenario forest use is limited to activities that do not result in commercial timber harvest or forest degradation. To clarify, the Project Scenario can include traditional non-commercial use of forests and forest products that do not result in commercial timber harvest or forest degradation (within a 5% *de minimis* range).	Section 2.1.2 Project Monitoring Reports
1.1.5g	Planned timber harvest must be estimated using forest inventory methods that determine allowable annual timber harvest volumes (m^3 ha^{-1}).	Appendix 3,4, and 21; Section 7.1
1.1.5h	There may be no leakage through activity shifting to other lands owned or managed by project participants outside the bounds of the carbon project.	Section 7.3
1.1.5i	Baseline activities can include legally sanctioned timber harvesting that degrades forest carbon stocks. This applies to some local government jurisdictions where forest degradation is either permitted or where such activity is likely to get a resource consent and where there is precedent. This also potentially applies to lands covered by the South Island Landless Natives Act (1906).	n/a

1.2 GOOD PRACTICE GUIDANCE

The Rarakau Rainforest Carbon Project has been developed to the Plan Vivo Standard. The Rarakau Rainforest Carbon Project uses each of the good practice guidance elements specified in Section 1.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. A description of how this good practice guidance was used in the design of the Rarakau Rainforest Carbon Project is provided in Table 1.2.1 below.

Table 1.2.1. Evidence Requirement: Good Practice Guidance

#	Good Practice Guidance	How it was used in this project
1.2.1a	IPCC 2003 Guidance on LULUCF	Carbon accounting methods and principles were used in the development of this PD using IPCC 2003 Guidance on LULUCF carbon accounting, resulting in a IPCC Tier 2 forest carbon accounting outcome for this project.
1.2.1b	IPCC 2006 Guidelines on National GHG Inventories	Wood density and dry wood to carbon default values used in the design of the Rarakau Rainforest Carbon Project applied the default values from the IPCC 2006 Guidelines on National GHG Inventories.
1.2.1c	Plan Vivo Standard	This project follows the Plan Vivo standard in every respect.
1.2.1d	The Clean Development Mechanism (CDM)	• The CDM was used as the broad framework for the Programme of Activities that this project is part of. • Exclusion of emissions derived from the removal of herbaceous vegetation was based on CDM EB decision reflected in paragraph 11 of the report of the 23rd session of the board: cdm.unfccc.int/Panels/ar/023/ar_023 _rep.pdf • The Additionality test in this methodology is from the VCS, which in turn is derived from the CDM Tool for Demonstration of Additionality.
1.2.1e	The Verified Carbon Standard (VCS)	• This PD closely followed the methodological guidance of the VCS (particularly the 2008 version as the more recent 2011 version was not available during 2010 when much of this PD development took place. • There was a close alignment of this methodology with the Green Collar IFM methodology approved by the VCS in 2010. Variations from this methodology were developed for purposes of simplifying project carbon accounting requirements and aligning them with the New Zealand national compliance forest carbon accounting regime.

1.2.1f	The New Zealand (compliance) Carbon Monitoring System	• This PD uses default values for carbon sequestration rates for New Zealand indigenous woody vegetation derived from the New Zealand compliance (Kyoto) carbon accounting system. • This methodology uses the same default value for below ground live biomass as the national compliance (Kyoto) carbon monitoring system.
1.2.1g	Climate Community and Biodiversity Standard (CCB)	• This PD uses the CCB standard to inform the stakeholder communications component of project development and implementation. This is elaborated in Section 2.12 of this PD.
1.2.1g	ISEAL Code of Good Practice: Setting Social and Environmental Standards v5.0 2010	Project Consultation Protocol
1.2.1i	Developing Social and Environmental Safeguards for REDD+: A guide for bottom-up approach. Imaflora, 2010.	Project consultation protocol
1.2.1j	Free Prior and Informed Consent: Principles and approaches for policy and project development. RECOFTC – The Center for People and Forests, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Sector Network Natural Resources and Rural Development – Asia.	Project consultation protocol
1.2.1k	The REDD+ Social & Environmental Standards (REDD+ SES) initiative.	Project consultation protocol
1.2.1l	United Nations Declaration on the Rights of Indigenous Peoples.	Project consultation protocol; Project Period of 50 years providing indigenous communal land owners the opportunity to make informed decisions concerning the management of their forest lands every 50 years, rather be locked into an obligation in perpetuity.

2. Describing the Project

2.1 PROJECT TITLE, PURPOSE(S) AND OBJECTIVE(S)

2.1.1 Project Title

The title of this project is: 'Rarakau Rainforest Carbon Project: IFM-LtPF Inception Project for the Rarakau Programme.'

2.1.2 Project Purpose

The purpose of the Rarakau Rainforest Carbon Project is the same as that provided in the methodology element of section 2.1.2 of this document.

The Rarakau Rainforest Carbon Project lists the additional purposes of:

a. To enhance Maori cultural development as a result of the project.
b. To enhance biodiversity conservation as a result of the project.

The broader purpose of the Rarakau Rainforest Carbon Project has been expressed by one of the kau matua (elders) of the Project Owner community as follows:

"Descendants of 99 named members of the following families; BAIRD, FLUERTY, MANIHERE, PAHAU, PERE, ROPATA, SAUNDERS, TIKOU, and WELLS, who were granted land under "The South Island Landless Natives Act 1906" (SILNA) comprise the shareholders of the "Rowallan Alton Incorporation" established in accordance with the Maori Affairs Act with a total land resource of 1,212 hectares.

""The Land" as we descendants call it, is situated in Te Waewae Bay on the coast between the Wairarakau (Rowallan Burn) and the Waikouau Rivers. It is accessed by road from Tuatapere, it is the only SILNA estate actively occupied and managed by its owners.

E te Ao,	to the world,
E te maramatanga,	to the light,
Me te aroha,	and to love
Mo enei taonga,	for the blessings,
E mihi nei.	I thank you all

"These simple words of greeting and of Karakia were one of the word forms that my ancestors used to greet the day, the life forms, and the various resources that they went to harvest each

day for their survival. To understand the forest and its resources and the sustainable management of that resource our ancestors first developed and then recorded orally and taught an understanding of;

- The land, (clay, humus, rock, gravel, etc.,
- The watershed, (mountains, hills, valleys, ridges, slopes, etc.,
- The waterways, (springs, streams, swamps, rivers, lakes, etc.,
- The flora,
- The fauna,
- And importantly, the controlled impact of people on all of the above.

“This was the old way. This was before “First Contact.” This was before the arrival of the Sealers, the Whalers, the Missionaries, and the European settlers who brought with them their new ways of “dealing” with the land, the water, the forest, and its inhabitants who needed these resources for their survival. Our ancestors in the South, in Murihiku, adopted very quickly to the new ways. They actively sought by trade and exchange the clothes, the blankets, the metal tools, and the ways of the newcomers.

“The old ways were discarded, disrespected, and even legislated against as the new people sought to clear the land of its forest or unsuitable vegetation and its inhabitants.

“My own ancestors the Baird family along with many others agreed to contracts offered by the sawmillers and “The Land” was cleared of its high value forest trees. That was the way in those days.

“The millers came, they felled what they wanted and they left.

“Papatuanuku the Earth Mother was unclothed, but she demonstrated her remarkable healing powers and as time passed neglect allowed her to re-clothe herself again in what is now called regenerating bush. And, lo and behold this regenerating bush, growing, increasing in volume every day is no longer a nuisance, it is a treasure, a taonga for us the descendants and the nation. It is now making a growing contribution to the health and wellbeing of our world through the immeasurable ecosystem services it provides as it grows and develops.

“In the words of my ancestors: “Ka mate papa uma, nga horo ai ki te whenua, ko tona taikaka, taikaha, hei oranga ano, mo tona whanau, mo tona hapu. Ka ora Papatuanuku.” And the trunk crumbles its essence to the Earth, its bark and flesh, as sustenance for its family seeds, and its kind. And our earth mother lives on.

“I, with the help and commitment of Dr Sean Weaver and his team, have sought to find and wish to continue to find and assess yet more ways to fulfill in some small way the role of Kaitiakitanga (Guardianship) of “The Land.”

"As this process proceeds I am again reminded of one of my daily Karakia:

Kia hiwa ra, kia hiwa ra.	Arise, rejoice.
He Ao rere ke tena tera tenei.	This is a world of difference here and there.
Kia hiwa ra ki tena tuku,	Arise to that direction distant,
Kia hiwa ra ki tera tuku,	Arise to that direction closer,
Kia hiwa ra ki tenei tuku,	Arise to that direction immediate,
Kia kiki, kia kaka,	To fill to over flowing,
Kia u ai, kia o ai, kia i ai, kia a ai.	To be secure, to be plentiful, to replenish.
Kia ronga roa ai te nganga,	So that the long sounds of life,
Kia rongo roa ai te tangi,	So that the long sounds of music,
Kia rongo roa ai te koko,	So that the long sounds of the Tui,
Kia rongo roa ai te ketekete,	So that the long sounds of the parrot,
Hei whakaki ai, Hei whakaka ai.	Will fill, will consume
Te Wao, Te Ao, Te Atea.	The bush, The World, The Universe.
E mihi ana, E tangi ana,	I greet you, I cry with you.
Tena koutou, tena koutou, tena Tatou katoa.	Greetings, greetings, greetings to us all.

"A goal of the management and shareholders of the Rowallan-Alton Incorporation is to develop a sustainable revenue stream from our indigenous forest resource. We want to use these revenues to enhance the quality and diversity of the forest by ongoing pest management, so that we, and our as yet unborn mokopuna can forever enjoy the sounds of the Tui, the Kaka, the Kiwi and maybe even the Kakapo. A further goal is to demonstrate by example, responsible sustainable management of "The Land" passed down to us by our ancestors who, through the actions of the Crown, found themselves recorded forever as the Landless Natives of the South Island." Ken McAnergney, May 2008. (Weaver et al 2008:7).

2.1.3 Project Objectives

The objectives of the Rarakau Rainforest Carbon Project are the same as those provided in the methodology element in Section 2.1.3 of this document. The Rarakau Rainforest Carbon Project lists five specific objectives:

a. Avoid GHG emissions from timber harvesting in the Project Area.
b. Enhance GHG removals through management of the Project Area as protected forest.

c. Ensure and document that the project conforms to the requirements of the Plan Vivo Standard and has been validated and verified.
d. Manage the project forests for biodiversity conservation (non-GHG co-benefit).
e. Manage the project forests for Maori cultural enhancement (non-GHG co-benefit).

2.2 TYPE OF GHG PROJECT

The project type for the Rarakau Rainforest Carbon Project is Improved Forest Management – Logged to Protected Forest (IFM-LtPF). The Rarakau Rainforest Carbon Project is the Inception Project of the Grouped Project entitled the 'Rarakau Programme'.

2.3 PROJECT LOCATION

The project area is a subset of the Rowallan-Alton Maori lands (13,217 ha), which collectively lie directly east of the Hump Ridge and west of the Waiau River in western Southland, New Zealand (Burrows et al. 1992). The area is divided into approximately 150 sections, most of which remain in Maori ownership. Eleven of these sections (A7 11-13 & R8 8-15) totalling 1,367 ha, are managed by the Rowallan Alton Incorporation. The Rowallan Alton Incorporation is the Project Owner of the Rarakau Rainforest Carbon Project.

2.3.1 Topography

The southern coastal areas of the Rowallan Alton survey region consist of low-lying terraces. The western and northern areas consist of rolling-to-steep hill country. Altitudes range from sea level to 606m.

2.3.2 Geology and Soils

Soils in the areas are mapped as podzolised yellow-brown earths and podzols (Matauira soils), very strongly leached with low natural fertility and poor drainage (Bruce 1984). Podzolised yellow-brown earths and podzols also dominate on the rolling and steep hill country.

2.3.3 Climate

Climatically, it can be described as cool temperate without moisture constraints for forest growth (annual rainfall of 1300 mm spread over 200 days[1]).

[1] Figures from Burrows et al. (1992).

2.3.4 Forests

The original forested cover, much of which is now extensively modified, was predominantly beech (Nothofagus spp.) forest with scattered rimu (Dacrydium cupressinum) (inland blocks) to beech/rimu mixes, to predominantly rimu forest nearer the coast. All of the Rowallan Alton estate has been logged during the 20th century. Parts of the property have been intermittently farmed and there has been some exotic tree planting. The remainder of the land is gradually reverting to native forest after past farming or indigenous timber harvesting activities. Timber resources were assessed in 1991/92 (Burrows et al. 1992, Appendix 4).

Merchantable timber tree species in the Rowallan Alton survey region include rimu (*Dacrydium cupressinum*), miro, (*Primopitys ferruginea*), totara (*Podocarpus cunninghamii*) silver beech (*Nothofagus menziseii*), mountain beech (*Nothofagus solandri var. cliffortioides*), kamahi (*Weinmannia racemosa*) and southern rata (*Metrosideros umbellata*) (Burrowes et al 1992).

2.3.5 Geographical Boundaries

The Rarakau Rainforest Carbon Project has prepared a series of maps as summarised in Table 2.3.5 below. Corresponding geographic coordinates are provided in Appendix 18.

Table 2.3.5. Evidence Requirement: Project Maps

#	Name/Description	Location
2.3.5a	Project Location Map 1. This map depicts the approximate project location on a New Zealand map image.	Supplied below in Section 2.3.5
2.3.5b	Project Location Map 2. This map depicts the location of the project on a regional scale map image.	Supplied below in Section 2.3.5
2.3.5bi	Project Location Map 3. Maori Land Blocks in the Rowallan Alton Survey Region.	Supplied below in Section 2.3.5
2.3.5ci	Project Area Map 1. This depicts the boundary of the Project Area.	Supplied below in Section 2.3.5
2.3.5cii	Project Area Map 2. 2011 Forest Area.	Supplied below in Section 2.3.5
2.3.5ciii	Project Area Map 3. 2011 Eligible Forest Area.	Supplied below in Section 2.3.5
2.3.5civ	Project Area Map 4. Project Area and Reference Areas	Supplied below in Section 2.3.5
2.3.5d	Logged and Unlogged Forest. This map depicts the Eligible Forest Area differentiated into two strata: Logged Forest and Unlogged Forest.	Supplied below in Section 2.3.5
2.3.5e	1990 Eligibility Map. This map depicts the Project Area and Eligible Forest Area using a remote image from 31 December 1989 to show that the Eligible Forest Area is located on land that was classed as 'forest land' as of that date.	Supplied below in Section 2.3.5
2.3.5f	Project Area Vegetation Map.	Supplied below in Section 2.3.5

Project Maps for the Rarakau Rainforest Carbon Project are provided below.

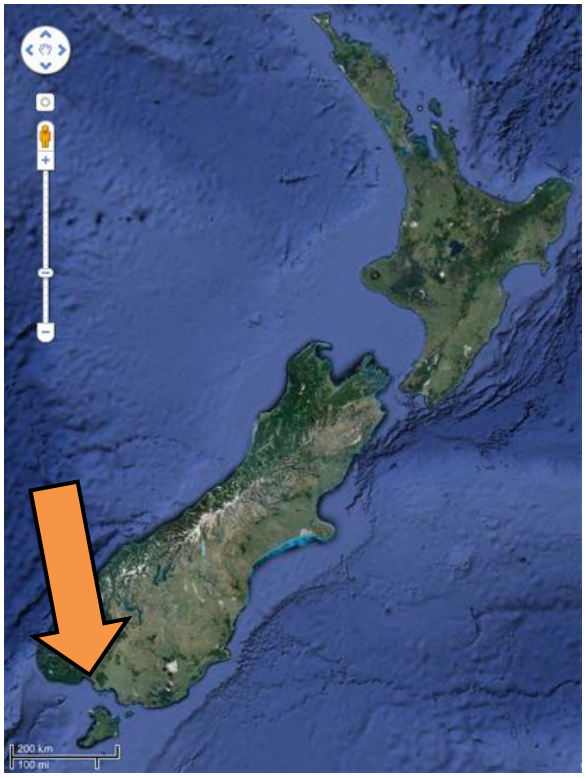


Figure 2.3.5a: Project Location Map 1, showing the project location in western Southland, New Zealand. Source: Google Earth.

Figure 2.3.5b. Project Location Map 2: Rarakau Rainforest Carbon Project Area Location in Western Southland (yellow rectangle). Source: Google Earth.

Figure 2.3.5bi. Project Location Map 3. Maori Land Blocks in the Rowallan Alton Survey Region (white lines). Image date: 2010.

Figure 2.3.5ci. Project Area Map 1. This depicts the boundary of the Project Area. White lines depict the aggregate of land parcels (Sections) that make up the Rowallan Alton Incorporation estate. Resolution: 0.4m. Image date: March 2011.

Figure 2.3.5cii. Project Area Map 2. 2011 Forest Area. White Line demarcates the Project Area. Green lines demarcate the contemporary forest/non forest boundary. All of the forest in the Project Area is 'Logged Forest'. Resolution: 0.4m. Image date: March 2011.

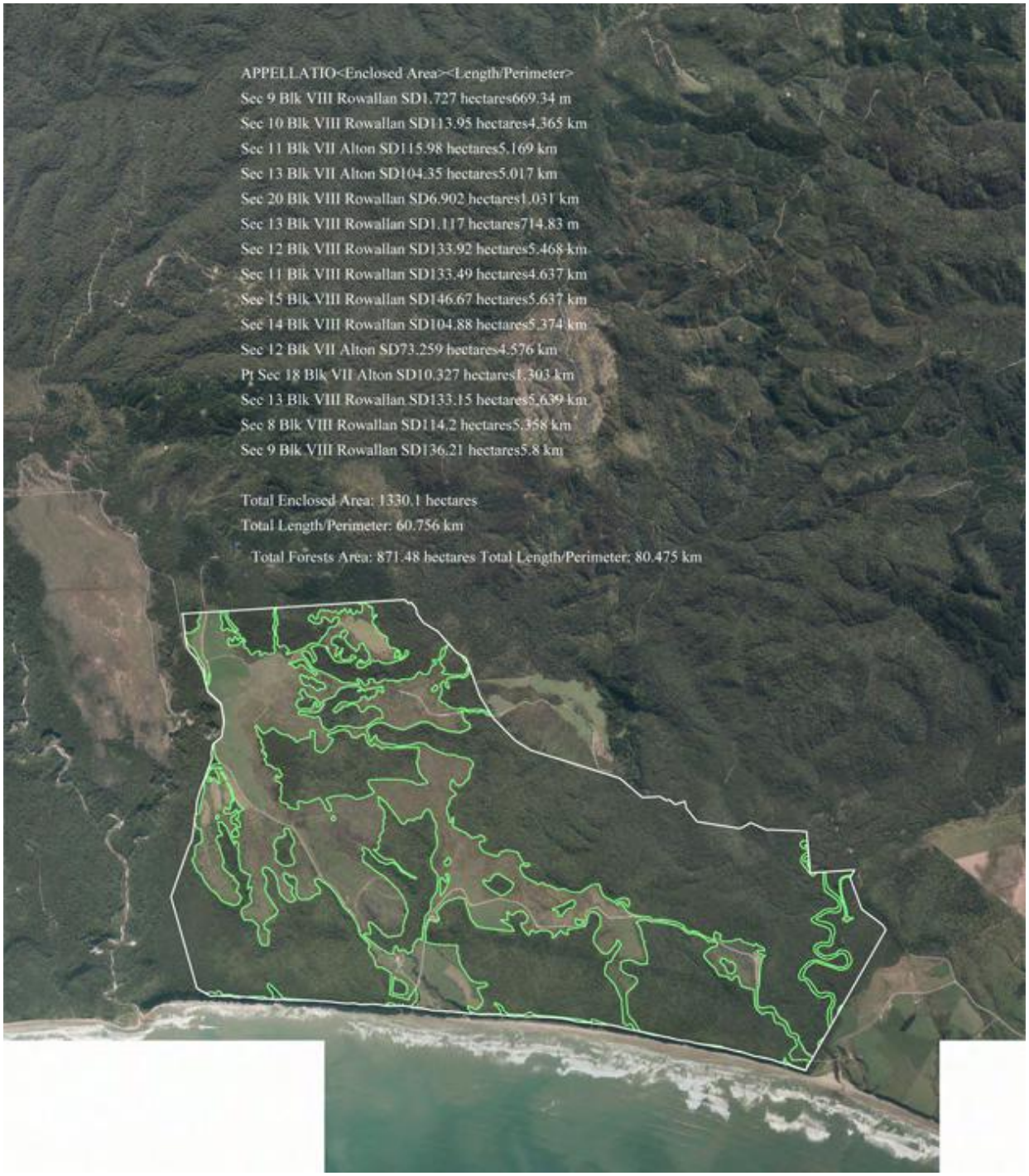


Figure 2.3.5iii. Project Area Map 3. 2011 Eligible Forest Area. Green polygons demarcate the Eligible Forest Area. Image date: March 2011.

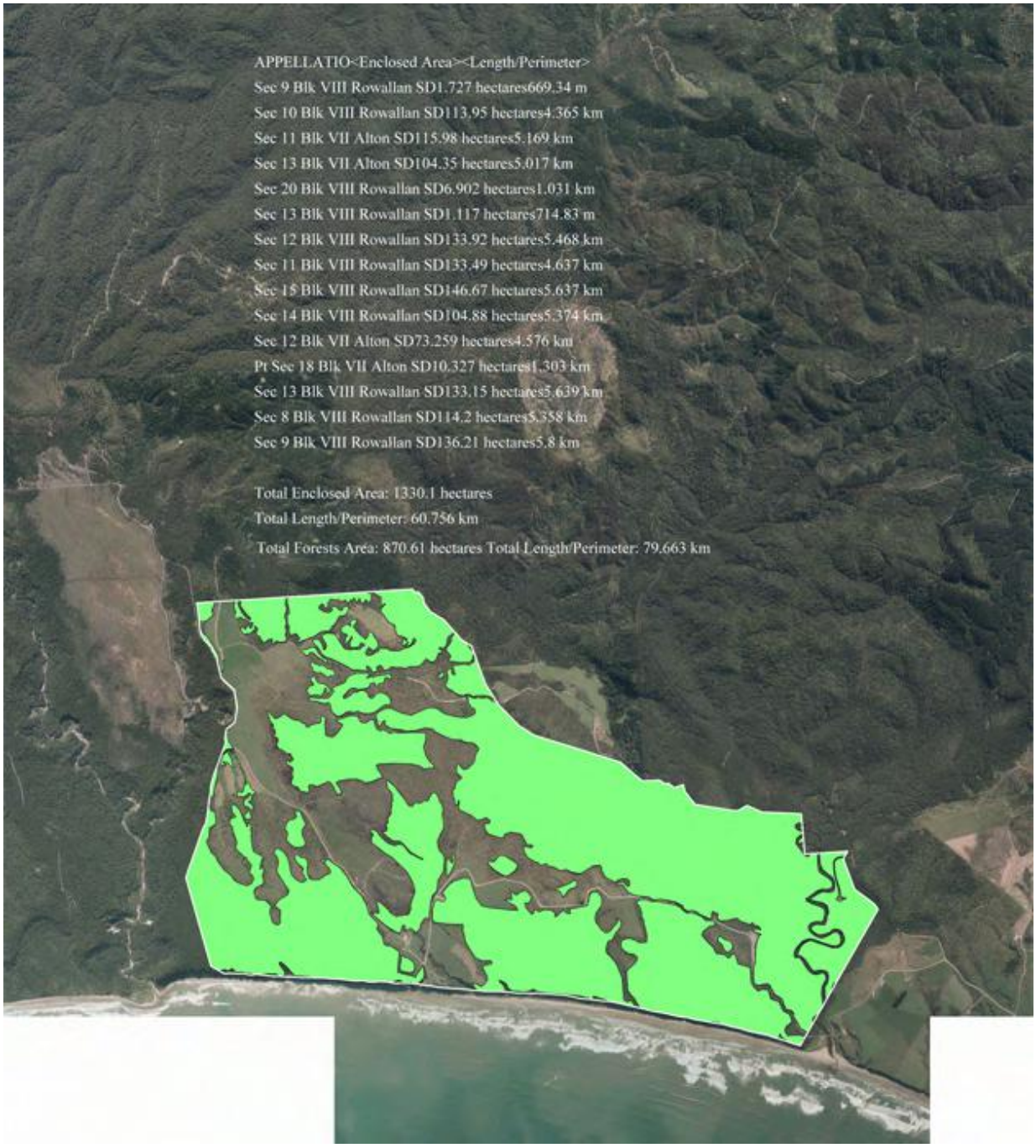


Figure 2.3.5civ. Project Area Map 4. Project Area and Reference Areas. White lines delimit land parcels comprising the Project Area and the Reference Area and the forest and non-forest strata within each land parcel. Image date: March 2011.

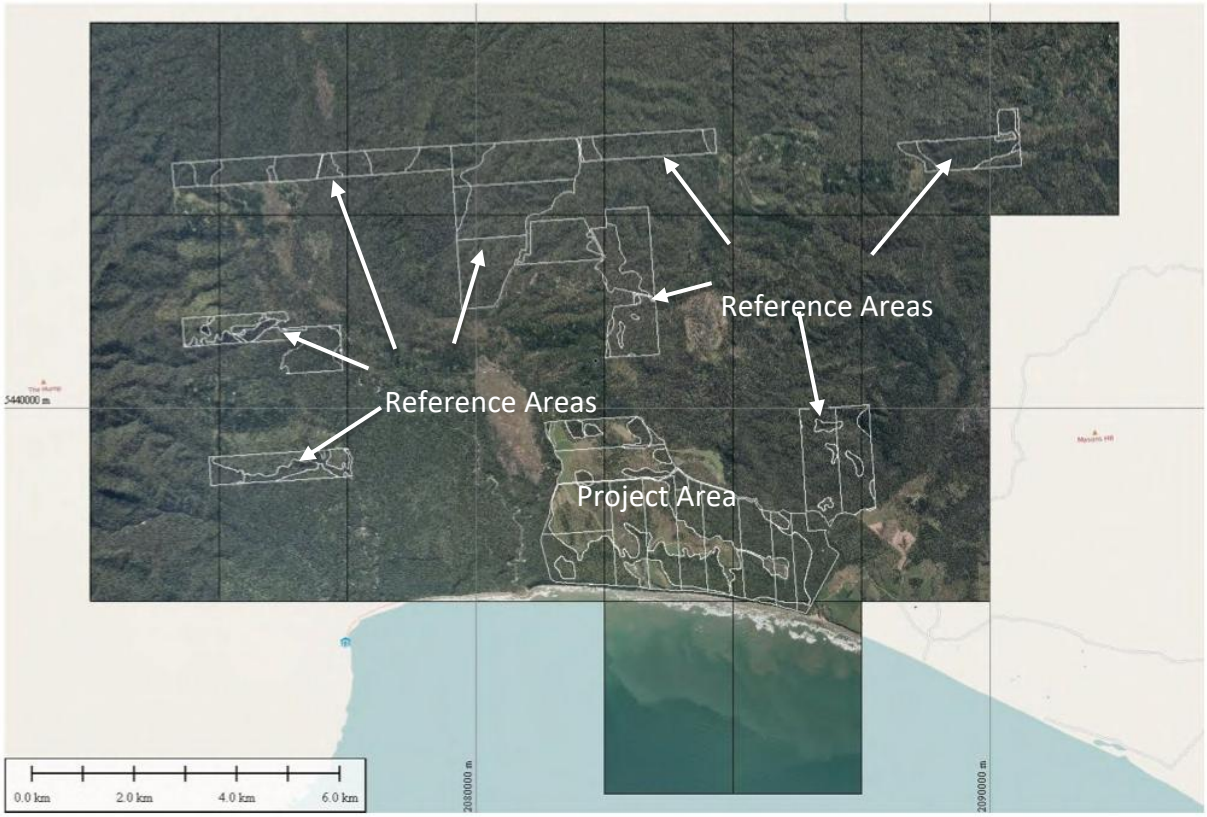


Figure 2.3.5d. Logged and Unlogged Forest: Rarakau Rainforest Carbon Project Area and Reference Area. Green = Unlogged Blocks; Grey = Logged Blocks.

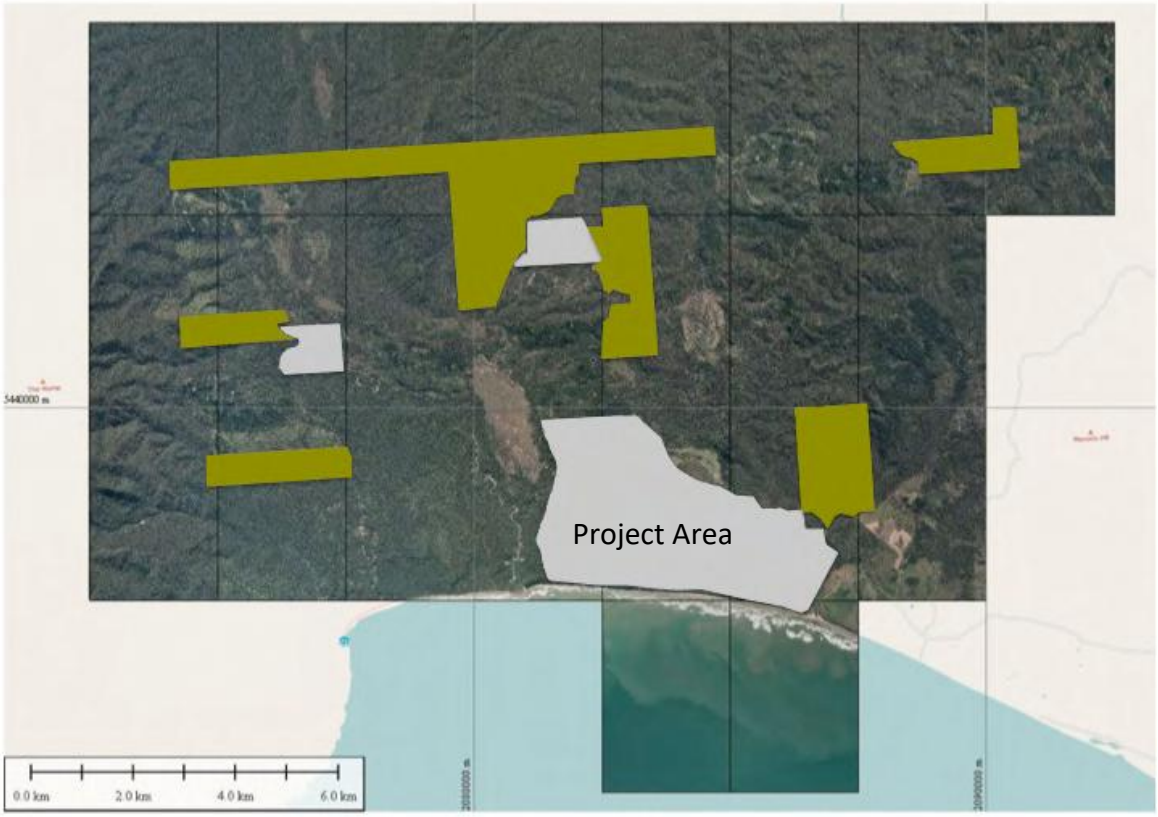
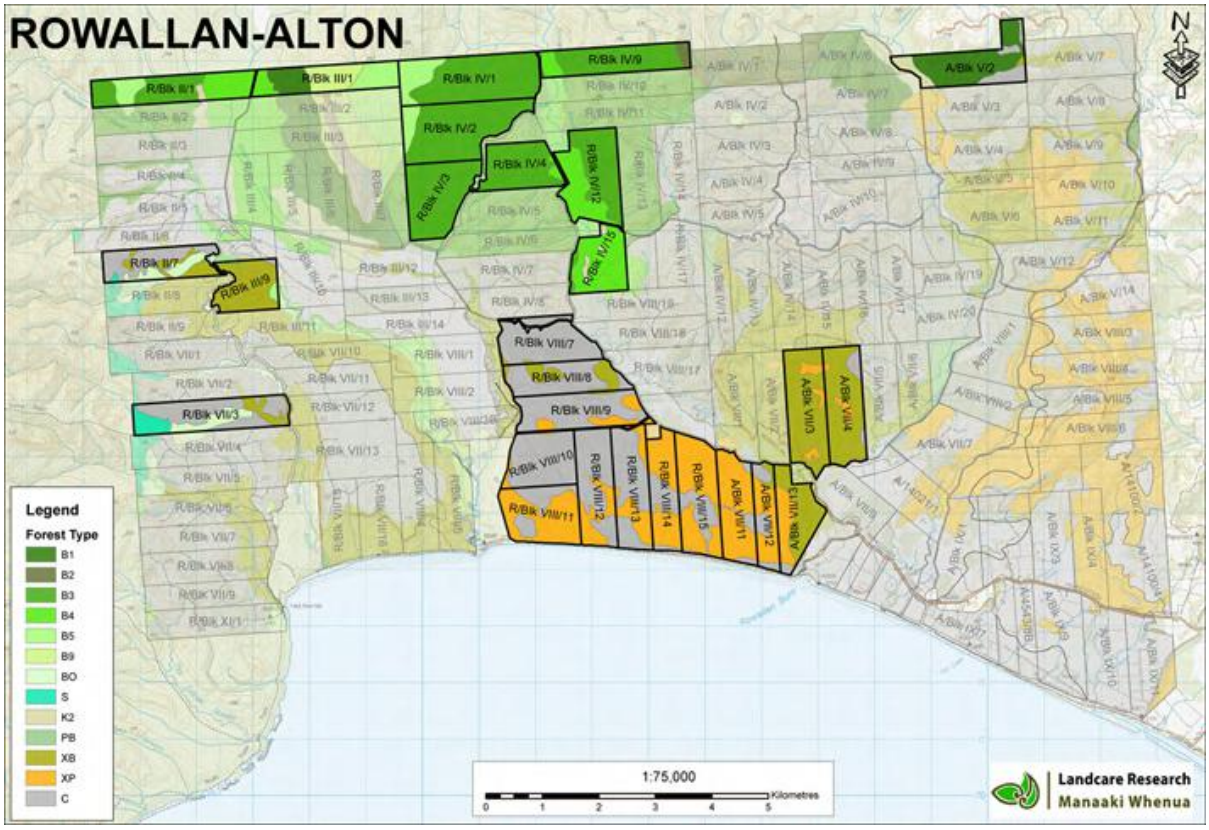


Figure 2.3.5e. 1990 Eligibility Map. Green lines demarcate the forest/non-forest boundary as of 1990. Resolution for aerial image for 1990 forest/non-forest boundary: 30m. Image date for backdrop photo: March 2011.

Figure 2.3.5f. Project Area & Reference Area Vegetation Map as at 2000. Grey indicates non-forest. All other colours indicate different forest types.



Key:

B1	Silver beech stands on strongly rolling terrain with scattered rimu esp. on ridges where kamahi abundant	S	Silver and/or mountain beech with rare podocarps, or no mountain beech or podocarps and an open canopy of large-branched silver beech over dense Blechnum and Pseudowintera.
B2	Similar to B1 but generally on drier sites, with sporadic occurrences of mountain beech and less kamahi, Blechnum and podocarps	K2	Small kahikatea generally of poor quality scattered throughout silver or mountain beech stands on cold wet valley alluviums.
B3	Found on strongly rolling terrain with dry ridges and wet gullies (Blechnum and kamahi restricted to wetter shady sites). Mountain beech attains greater frequencies than in B2 and may dominate locally.	PB	Podocarp stands usually adjacent to P1, P2, or P3 with up to 50% silver beech. Rimu and beech are both of high timber quality. Occurs along stream systems.
B4	Silver beech stands on recent valley alluviums. Thicket understories of small leaved Coprosmas over moss and filmy fern with occasional poor quality rimu or kahakitea.	XB	Beech areas containing no accessible timber resources [accessibility here assessed under timber harvesting rules prior to 1993], for example, gorges, rock outcrops.
B5	Uneven aged, open canopy stands of silver beech over kamahi and dense Blechnum discolor. A variant of BO and mainly found on the east facing slopes on calcareous sandstones.	XP	Podocarp areas containing no accessible timber resources [accessibility here assessed under timber harvesting rules prior to 1993], for example, gorges, rock outcrops.
B9	A composite type of silver and/or mountain beech and includes stands of other species. Generally regarded as non-merchantable due to defect and low volumes.	C	Non-forest
BO	Uneven aged stands of silver beech/kamahi with dense Blechnum. Intermediate between PB, B1 and B5; contains rimu & scattered miro & Hall's totara.		

2.3.6 Project Areas

The Project Areas for the Rarakau Rainforest Carbon Project are described below.

Table 2.3.6. Evidence Requirement: Project Areas		
#	Name/Description	Location
2.3.6.1	Project Area	Supplied in Section 2.3.6.1 and Appendix 18
2.3.6.2	Forest Area	Supplied in Section 2.3.6.2 and Appendix 18
2.3.6.3	Eligible Forest Area	Supplied in Section 2.3.6.3 and Appendix 18 in the form of the aggregation of 'Operational Forest Areas' from the Sustainable Forest Management Plans for each land parcel. The calculations in the quantification of the Baseline and Project Scenario GHG emissions uses the term 'Operational Forest Area' (OFA) for the Eligible Forest Area GHG accounting.

2.3.6.1 Project Area

The Project Area (PA) for the Rarakau Rainforest Carbon Project is depicted in Figure 2.3.5ci and comprises 1,367ha.

Table 2.3.6.1. Lands within the Project Area

Rowallan Blocks		Alton Blocks	
Block	Section	Block	Section
VIII	8,9,10,11,12,13,14,15	VII	11,12,13

2.3.6.2 Forest Area

The Forest Area (FA) for the Rarakau Rainforest Carbon Project is depicted in Figure 2.3.5cii and comprises 871ha.

2.3.6.3 Eligible Forest Area

The Eligible Forest Area (EFA) (also denoted as the Operational Forest Area – OFA) for the Rarakau Rainforest Carbon Project is depicted in Figure 2.3.5ciii and Appendix 6, and comprises 870ha gross. The EFA for purposes of the Rarakau Rainforest Carbon Project is 738ha and takes into consideration Eligible Forest Areas excluded from the carbon project due to inaccessibility and areas removed due to land management considerations.

2.3.6.4 1990 Forest Boundary

The 1990 Forest Boundary is depicted in Figure 2.3.5e and is mapped using aerial imagery from a Landsat image from 1990 with a resolution of 30m. Some areas not shown as forest in Figure 2.3.5e were indeed forest as of 1989 (and earlier) but the imagery resolution did not allow all such areas to be mapped as such. These areas are accounted for by removing areas from the Eligible Forest Area used for GHG accounting purposes in this project (i.e. Eligible

Forest Area gross is 870 ha whereas the Eligible Forest Area used for GHG accounting in this project is 738 ha.

2.3.7 Reference Area

The reference area for the Rarakau Rainforest Carbon Project encompasses neighbouring logged and unlogged forest lands that have had sustainable forest management plans developed for them. The reference area land parcels used in the Rarakau Rainforest Carbon Project are as follows:

Table 2.3.7. Reference Area Sections

Rowallan Blocks		Alton Blocks	
Block	Section	Block	Section
II	1,7	V	2
III	1,9	VII	2,3
IV	1,2,3,4,9,12,15		

These Reference Areas are depicted in Figures 10, 11 and 12, with supporting documentation in the form of sustainable forest management plans provided in Appendix 4.

2.4 ORIGINAL CONDITIONS

The original conditions of forests in the Eligible Forest Area are described in Table 2.4 below.

Table 2.4. Evidence Requirement: Original Conditions		
#	Name/Description	Location
2.4a	Evidence of old growth forest areas in the Eligible Forest Area.	n/a
2.4b	Evidence of regenerating forest areas in the Eligible Forest Area	Appendix 3, 21; Burrows et al 1992 (supplied in Appendix 9); and Table 6, page 22,23 in MAF 2000 (supplied in Appendix 10).

The original condition of the forests in the Rarakau Rainforest Carbon Project is regenerating logged forest.

2.5 PROJECT GHG STRATEGY

The Rarakau Rainforest Carbon Project will achieve GHG emission reductions and removal enhancements during the Project Period. The GHG emission reductions will be achieved by

terminating commercial timber harvests and terminating fire as a land management practice on adjacent agricultural lands owned and controlled by the Project Owners. The removal enhancements will be achieved by terminating commercial logging and fire management activities that arrest the process of natural succession. The project scenario will allow natural succession to continue unabated towards an old growth condition.

Table 2.5. Evidence Requirement: Project GHG Strategy		
#	Name/Description	Location
2.5a	Termination and/or avoiding commercial wood harvesting	Programme Agreement between Project Owner and Programme Operator (Appendix 17). Project Monitoring Reports.
2.5b	Termination of the use of fire as a land management practice	Programme Agreement between Project Owner and Programme Operator (Appendix 17). Project Monitoring Reports.
2.5c	Implementation of Project Implementation Plan	Project Monitoring Reports.
2.5d	Legal protection of project forests	A memorandum of encumbrance was lodged against the land title at first verification. See Appendix 16

2.5.1 Project History

The Rarakau Rainforest Carbon Project began as an idea in 2007 through discussions between Rowallan Alton Incorporation (RAI) and Carbon Partnership Ltd. Carbon Partnership was interested to explore whether the RAI indigenous forests could be protected from future logging by means of a carbon project through the international voluntary carbon market. RAI understood that their pre-1990 indigenous forest was ineligible for crediting under the New Zealand Emissions Trading Scheme (then in development) because of it lying outside the LULUCF carbon accounting boundary of the Kyoto Protocol. Carbon Partnership understood that because the forests lay outside the carbon accounting boundary of the Kyoto Protocol, they lay inside the carbon accounting boundary of the international voluntary carbon market. It was on this basis that RAI and Carbon Partnership agreed to pursue the development of a forest carbon project.

On this basis a project proposal was developed that would operate in three phases:

1. Pre-feasibility assessment
2. Feasibility study
3. Implementation

The project would only advance to the subsequent phase if justified.

Phase 1 was completed in May 2008 with funds from Te Puni Kokiri (Ministry of Maori Development). The prefeasibility assessment demonstrated that a forest carbon project using the international voluntary carbon market was indeed feasible. The next task was to proceed with the design of a methodology and preliminary PD.

Proceeding to Phase 2 was conditional upon Rowallan Alton Incorporation (RAI) making a commitment to protecting the forests subject to the forest carbon project. This commitment was made in late 2008 with the project start date to be 1 January 2009.

At that stage in project development Rowallan Alton Incorporation and Carbon Partnership were both unsure exactly how the project would occur because at this stage the methodology had not yet been designed nor the PD developed. As such, project development for a forest carbon project proceeded after the project start date and continued until validation of the methodology and PD in 2012.

Funding for Phase 2 was secured from Te Puni Kokiri in June 2009, with Phase 2 activities beginning later that year. Phase 2 was completed in August 2010 and involved the preliminary design of a project methodology and the preparation of a draft PD.

Funding for Phase 3 was secured funding for Phase 3[2] from Te Puni Kokiri in March 2011. Phase 3 involved:-

- The completion of the methodology for a grouped project (Rarakau Programme Methodology D2.1 v2.0, 15 May 2018).
- The completion of the PD for the Inception Project (this document).
- The completion of the first Monitoring Report.
- Validation of the Rarakau Programme Methodology and Inception Project PD.
- Verification of the first Monitoring Report for the Inception Project.

Phase 3 was completed in mid-2012.

2.6 PROJECT OUTPUTS

The Rarakau Project uses each of the project technologies described in Section 2.6 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

The Rarakau Rainforest Carbon Project is integrated into a resource management programme developed and managed by the Rowallan Alton Incorporation to generate community-based benefits to current and future generations of landowners of this estate.

The resource management programme in development by the Rowallan Alton Incorporation include the following components:

- Development of improved pasture in suitable non-forest areas for dairy grazing under contract to local dairy farms
- Development of a lodge to provide accommodation and a focal point for the gateway to Fiordland National Park and the renowned Hump Ridge Track. RAI hopes the

[2] Carbon Partnership also provided project development funds for Phases 2 and 3.

Rarakau Lodge will provide a base for cultural and environmental education for the shareholders of RAI and other Maori and non-Maori groups.

- Intensive biodiversity conservation management of a zone of coastal forest to provide an enhanced wildlife habitat
- Forest conservation management of forest lands otherwise (and previously) used for commercial forestry – the Rarakau Rainforest Carbon Project.

The non-carbon project activities include commercial (dairy grazing) and non-commercial activities that in their aggregate generate a range of benefits to the RAI membership.

The Rarakau Rainforest Carbon Project will involve forest conservation management activities including:

- Avoidance of commercial timber harvesting for the project period
- Avoidance of fire in the entire project area as a farm management tool
- The control of pests and weeds
- Management of visitor numbers to the project area
- Environmental and cultural educational programmes developed and run at the Rarakau Lodge
- Monitoring the project according to the monitoring plan.

A Land Manager lives on and owns land adjacent to the RAI estate. The core role of the Land Manager role is to oversee the management of the farming activities on non-forest lands and to act as caretaker of the Rarakau lodge. The Land Manager also plays a role in managing the Rarakau Rainforest Carbon Project as follows:

- Ensuring that no illegal logging takes place on the land
- Ensuring that fire is not used within the Project Area
- Liaise with neighbouring properties and rural fire service to reduce risk of fire
- Undertake weed and pest control activities
- Act as the first point of contact for recreational users of the forests in the area for trekking and/or hunting
- Monitor the project boundary.

The Farm Manager will report to the Project Manager who will coordinate the project management and monitoring of the Rarakau Rainforest Carbon Project in a co-management role with the Project Developer. This co-management arrangement will involve a gradual scaling down of involvement of the Project Developer through the first two monitoring cycles, to the point at which all project management and project monitoring will be undertaken by the Project Manager and Land Manager with minor (advisory) input from the Project Developer.

It is the intention of the Project Owner that the Rarakau Rainforest Carbon Project will be used as an educational resource for other subsequent projects undertaken in the Rarakau Programme and potentially for wider environmental educational opportunities that focus on

sustainable land management in a Maori cultural setting. This educational resource will include providing a model for how forest carbon projects in the Rarakau Programme can be undertaken, including co-management and project governance arrangements.

2.7 CARBON BENEFITS

Carbon Partnership asserts that the aggregate carbon benefits from the implementation of the Rarakau Rainforest Carbon Project arise from the following activities in the following estimated volumes (elaborated in Section 7.1.9 and 7.2.3 of this PD). This includes a baseline revision and consequent adjustment to carbon accounting calculations:

Table 2.7.1. Rarakau Rainforest Carbon Project GHG Assertion

Acronym	Activity	Description	$tCO_2e\ yr^{-1}$
NBEA	Net Baseline Emissions Avoided	Avoided emissions from terminating and/or avoiding baseline timber harvesting, and allocated/issued for Year 1 only.	342
BUFNBEA	Buffer for Net Baseline Emissions Avoided	Buffer for avoided emissions from terminating and/or avoiding baseline timber harvesting, and allocated/issued for Year 1 only.	38
NPR	Net Project Removals	Removal enhancement from terminating activities that arrest natural succession of the forest, allocated/issued for Years 1-50.	2,730
BUFNPR	Buffer for Net Project Removals	Buffer for removal enhancement from terminating activities that arrest natural succession of the forest, allocated/issued for Years 1-50.	300
BUFTOT	Buffer for NBEA & NPR	Buffer for avoided emissions and removal enhancements.	338
NCC	Net Carbon Credits	NBEA minus BUFNBEA, plus NPR minus BUFNPR.	2,734

2.8 PROJECT RISKS

The risks assessment of the Rarakau Rainforest Carbon Project include the following risk categories:

- Internal Risk 1: Project Management Risk
- Internal Risk 2: Financial Viability Risk
- Internal Risk 3: Opportunity Cost Risk
- Internal Risk 4: Project Longevity
- External Risk 1: Land Ownership And Resource Access/Use Rights Risk
- External Risk 2: Community Engagement Risk
- External Risk 3: Political Risk
- Natural Risk 1: Fire
- Natural Risk 2: Pest and Disease
- Natural Risk 3: Extreme Weather
- Natural Risk 4: Geological Risk

The risk assessment for the Rarakau Rainforest Carbon Project is presented in Section 8.2. The buffer determination is calculated in Section 8.3.

2.9 PROJECT ROLES & RESPONSIBILITIES

The Rarakau Rainforest Carbon Project follows the structure presented in Section 2.9 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

Table 2.9. Evidence Requirement: Roles and Responsibilities		
#	Name/Description	Location
2.9a	Project Roles and Responsibilities	Evidence for the assigning of roles and responsibilities is provided in Section 2.9.1 below.

2.9.1 Project Coordinator

The Project Coordinator is Carbon Partnership Ltd. - an established legal entity that takes overall responsibility for the project and meeting the requirements of the Plan Vivo Standard for its duration. The Project Coordinator has the legal and administrative capacity to enter into *PES agreements* with participants and to manage the disbursement of payments for ecosystem services.

The Project Coordination strategy is for Carbon Partnership to play the leading role in project coordination activities and to share responsibilities as much as possible with the Project Owner. The goal is to reduce the effort and responsibility of Carbon Partnership and correspondingly increase the effort and responsibility of the Project Owner through time as a result of capacity building activity.

Carbon Partnership Ltd has been in operation in forest carbon markets since 2007 and has the capacity to support participants in the design of project interventions, select appropriate participants for inclusion in the project, and develop effective participatory relationships including providing ongoing support as required to sustain the project.

Carbon Partnership Ltd undertook a stakeholder analysis to identify key communities, organisations, and local and national authorities that have a stake in the project.

These include:

- Rowallan Alton (Maori) Incorporation (Project Owner)
- Carbon Partnership Ltd (Project Coordinator)
- Ekos (Programme Operator and carbon credit sales agent)
- Southland District Council (local government regulator)
- Ministry for Primary Industries (national government regulator)
- Te Puni Kokiri / Ministry for Maori Development (funding support)

Carbon Partnership Ltd has taken steps to inform each of these stakeholders about the project, to seek their views, and secure approval where necessary.

2.9.2 Key Project Stakeholders

Project Owners and Project Coordinators for the Inception Project and each Sub-Project of this Grouped Project must provide information concerning roles and responsibilities for the project. These roles and responsibilities are also defined in the Project Consultation Protocol.

Table 2.9.2a. Project Roles And Responsibilities: Rarakau Rainforest Carbon Project

Primary Participants		
Role	Responsibility	Legal Instrument
Project Owner: **Rowallan Alton Incorporation**	Owner of carbon rights	• By default
	Counter-party to carbon buyers and brokers	• VER Purchase Agreements with carbon buyers and/or VER Brokerage Agreements with brokers
	Project co-management	• Project Development Agreement with Project Developer
	Project co-monitoring	• Project Agreement with Project Developer
Project Developer: **Carbon Partnership Ltd**	Project designer and developer	• Licence Agreement with Programme Operator
	Project designer and developer	• Project Agreement with Project Owner
	Project co-management	• Project Agreement with Project Owner
	Project co-monitoring	• Project Agreement with Project Owner
	Project registry agent for carbon credits	• Registry Communications Agreement with Registry & subject to Project Agreement with Project Owner
	Credit sales and marketing agent	• Project Agreement with Project Owner
	Project insurance facilitator	• Project Agreement with Project Owner
Programme Operator: **Ekos**	Guardian of environmental integrity of Rarakau Programme	• Licence Agreement with Project Developer • Programme Agreement with Project Owner • Project Owner representation on Advisory Board of Programme Operator
	Beneficiary of Memorandum of Encumbrance	• Memorandum of Encumbrance with Project Owner
	Project registry agent for pooled buffer account	• Programme Agreement with Project Owner • Licence Agreement with Project Developer
	Owner of buffer credits	• Programme Agreement with Project Owner • Licence Agreement with Project Developer
	Owner of IP associated with Rarakau Programme (including methodologies)	• Licence Agreement with Project Developer
Project Standards	• Plan Vivo	• Validation/Verification Service Agreement with Project Developer

Project Validator/Verifier: **Misheck Kapambwe**	Plan Vivo approved Validator and verifier	• Validation/Verification Service Agreement with Project Developer
Project Registry: **Markit Environmental Registry**	• Carbon credit registry • Issuance of VERs	• Registry Terms and Conditions • Registry Communications Agreement with Project Developer • Registry Agent clause in Project Agreement between Project Developer and Project Owner • Registry Agent clause in Programme Agreement with Project Owner
Carbon Credit Buyer **Various**	Ekos acts as sales agent for carbon credits issued to this project.	• VER Purchase Agreements with carbon buyers and/or VER Brokerage Agreements with brokers
Secondary Participants		
Project Developer's subcontractors	Legal consultants • **Venture Partners**	• Service Contracts with Project Developer
	Forest inventory contractors • **Landcare Research** • **GreenCo** • **Tomorrow's Forests**	• Service Contracts with Project Developer
	Mapping and remote sensing contractors • **Aerial Surveys Ltd** • **Tomorrow's Forests**	• Service Contracts with Project Developer
Carbon Credit Broker	Carbon credit sales intermediary • **Tasman Environmental** • **Ekos**	• Brokerage Agreement with Project Developer and Project Owner
Project insurers	None assigned	The project owners have decided to rely on the self insurance of the project through the buffer reserve allocation.

Table 2.9.2b. Contact Details: Rarakau Rainforest Carbon Project

Entity	Role	Contact Details
Ekos	Programme Operator	Kathy Olsen Ekos P.O. Box 19171, Courtenay Place, Wellington 6149, New Zealand Ph: +64 4 805 0098 x 861
Carbon Partnership Ltd	Project Developer	Sean Weaver Principal, Carbon Partnership Ltd 29 Central Takaka Rd, RD1 Takaka 7183, Golden Bay, New Zealand Ph: +64 3 525 6073 Skype: seanweaver www.carbonpartnership.co.nz sean@carbonpartnership.co,nz
Rowallan Alton Incorporation	Project Owner	Harold Thomas Chairperson, Rowallan Alton Incorporation

		21 Omahi St, Waikanae 5036
Markit Environmental Registry	Project Registry	Markit Environmental 4th floor Ropemaker Place 25 Ropemaker Street London, EC2Y 9LY Ph: +44 20 7260 2192 Office Ph: +44 758 439 2860 Mobile www.markit.com www.markitenvironmental.com
Misheck Kapambwe	Plan Vivo approved Project Validator/verifier	misheck.kapambwe@gmail.com +61 (0) 416 684 650

2.9.3 Project Key Personnel

Sean Weaver, Principal, Carbon Partnership Ltd (Takaka, New Zealand). Role in this project: Programme Designer – Rarakau Programme; Project Developer Rarakau Rainforest Carbon Project. Sean is an indigenous forest carbon management consultant specializing in REDD+ policy, strategy, financing, MRV and implementation. Sean has 25 years' experience in indigenous forest conservation in New Zealand and the Pacific Islands. He works with Maori forest owners in the development of voluntary carbon market opportunities for pre-1990 indigenous forests. He has advised the New Zealand Ministry of Agriculture and Forestry on pre-1990 indigenous forest carbon for post-2012 forest carbon policy. In the Pacific Islands, Sean is the lead consultant to the GIZ/SPC Fiji National REDD+ Programme providing policy, strategy, finance, and technical support to the Fiji Department of Forestry. He is also the lead policy consultant to the GIZ/SPC Pacific Regional REDD+ Programme. He established the Vanuatu REDD+ readiness programme gaining funding from the UK government, the World Bank, and the European Commission. He is a former senior lecturer at Victoria University of Wellington (2001-2009) where he coordinated the undergraduate Environmental Studies Programme. He holds a PhD in Forestry from the University of Canterbury, New Zealand. Web link: http://www.carbon-partnership.com/

Ken McAnergney, Rowallan Alton Incorporation (Christchurch, New Zealand). Role in this project: Project Owner principal counterpart to Carbon Partnership Ltd in a strategic partnership to develop the Rarakau Progamme and Rarakau Rainforest Carbon Project. Ken is a kau matua (elder) and founding member of the Rowallan Alton Incorporation – an aggregation of Maori landowners forming the Project Owner community for the Rarakau Rainforest Carbon Project. Ken is of Waitaha descent. Professionally, Ken is the Manager Airport Planning at Christchurch International Airport.

Ian Payton, Scientist, Landcare Research Ltd (Christchurch, New Zealand). Role in this project: Ian collaborated with Sean Weaver in the design of the GHG accounting methodological elements with particular reference to linkages and synergies with the New Zealand compliance LULUCF carbon accounting. Ian is an expert in indigenous forest carbon inventory. Ian is currently Research Leader in the Global Change Processes team, and manages the

indigenous forest, shrubland and soils data collection project for the national carbon monitoring programme. He was Research Field Leader from 1989 and Acting Divisional Director during 1991–92 for the Department of Scientific and Industrial Research (now Landcare Research). Ian is has been employed by Landcare Research since 1992 as a forest, shrubland and grassland ecologist. Ian designed the indigenous forest and shurbland data collection manual for the New Zealand Carbon Management System and has been a key figure behind the design of the New Zealand Kyoto compliance carbon accounting regime for indigenous forests and shrublands. Ian also worked with Carbon Partnershi in the design of the Fiji national forest carbon inventory system. He also works in forest carbon inventory projects in Ethiopia and Equador. Web link:

http://www.landcareresearch.co.nz/research/staff_page.asp?staff_num=315

Murray Ward, Principal, GtripleC Ltd, (Wellington, New Zealand). Role in this project: Climate policy and carbon market scoping at early stages of project scoping (2007 and 2008). Murray assisted with clarification of forest carbon market options for the Rowallan Alton Incorporation including the voluntary carbon market opportunity arising from the forests falling under Article 3.4 of the Kyoto Protocol and thereby lying outside the GHG accounting boundary and therefore eligible for carbon trading under the voluntary carbon market. Murray led the New Zealand Ministry for the Environment's climate change team from 1996 to 2002. He managed the development of domestic climate change policy and was a leading senior negotiator in NZ delegations to international climate change meetings, specialising in market mechanisms and land use, land-use change and forestry. Murray founded Global Climate Change Consultancy (GtripleC) in 2003 to provide high-level strategic counsel to a range of international public and private sector clients. GtripleC's focus is in market mechanisms and climate finance and investment instruments for the energy, industrial and forest sectors. GtripleC works for clients directly and, as well, in associations with other domestic and international consultancy groups. Current and recent work includes preparing background briefs on new market mechanisms for the World Bank's Partnership for Market Readiness group, policy briefs for the UK Climate Development Knowledge Network in conjunction with the World Resources Institute, background papers for the UK Capital Markets Climate Initiative and work on nationally appropriate mitigation actions (NAMAs) and low carbon development plans in conjunction with Ecofys. Web link: http://www.gtriplec.co.nz/

Greg Fahey, Director, Venture Partners Limited (Dunedin, New Zealand). Roel in this project: Greg has provided legal consulting services to the Rarakau Rainforest Carbon Project with particular reference to the design of the structural relationship between the Rarakau Programme and the Rarakau Rainforest Carbon Project, the legal instrument for protecting the forests, and the design of the buffer protocols. Greg has worked in international environmental markets since 2005 and combines a deep background in the carbon sector with 11 years experience as a corporate lawyer for international law and environment firms. He is presently involved in carbon finance, trading and consulting initiatives in the NZ ETS and international voluntary markets, with a special focus on the design and implementation of

effective carbon portfolio management strategies for New Zealand forest owners as they transition to the NZ ETS. From 2007 to 2010, Greg led the corporate legal team of carbon market pioneer EcoSecurities in the UK; participating in numerous CDM, EU ETS, Kyoto and voluntary projects and transactions in both primary and secondary markets. Prior to this, he was corporate counsel for global environmental consultancy, ERM and a private practice lawyer with international law firms SJ Berwin and DLA Phillips Fox. Web link: http://www.venturepartners.co.nz/

Tim Hewitt, Consultant, Sinclair, Knight, Merz (Wellington, New Zealand). Role in this project: Tim has provided financial cost benefit analysis and additionality assessment services to this project. Tim has a broad set of skills and experience across environmental management, strategy, and sustainability with a focus on climate change mitigation for governments, businesses, and non-government organisations. Tim has applied his technical skills of greenhouse gas accounting, policy, and economics to a number of clean development mechanism (CDM) projects, input into New Zealand's National Greenhouse Gas Inventory, Emission Trading Scheme policy design advice, voluntary carbon market projects, business greenhouse gas inventories, project option greenhouse gas comparative assessment, and advice to Governments on carbon finance opportunities. Web link: http://www.skmconsulting.com/Markets/New-Zealand/

Clayton Wallwork, Director, GreenCo Ltd (Christchurch, New Zealand). Role in this project: Sustainable Forest Management Plan development for baseline emissions calculations for forests in the Reference Area and the Project Area. Clayton has worked with indigenous forestry owners on all aspects of Sustainable Forest Management Plans in compliance with Part IIIA of the Forests Act 1949, Conservation Act 1987 and the Resource Management Act 1991. The work involved site visits, forest assessments including random plot assessments, GPS and GIS forest mapping, preparation of sustainable forest management plans (significant documentation to comply with above acts) for registering on land titles. Employed by the Ministry of Agriculture and Forestry Indigenous Forestry Unit for 7 years as a Forestry Advisor, and employed as a registered forestry consultant Greenco Ltd for 6 years. Web link: http://www.greenco.co.nz/

Steve Smith, Business Development Manager, Aerial Surveys Ltd (Auckland, New Zealand). Role in this project: Mapping services for the Rarakau Rainforest Carbon Project. Aerial Surveys is an innovative aerial photography and geospatial mapping service provider. Their core products and services include digital aerial photography and mapping, remote sensing, and specialised and patented forest inventory management tools. They have a number of strategic relationships enabling them to combine expertise where necessary in various technologies to ensure a high quality product is delivered. Web link: http://www.aerialsurveys.co.nz/

Mairéad de Roiste, Lecturer, School of Geography, Environment and Earth Sciences, Victoria University of Wellington (Wellington, New Zealand). Role in this project: GIS and remote sensing support during early stages of project development. Mairéad is a lecturer in GIS and remote sensing. She has lectured on GIS in Trinity College Dublin and the Dublin Institute of

Technology. She was actively involved in Irlogi (the Irish GIS organisation) and was the secretary of the Geographical Information Science Research Group (GIScRG) of the Royal Geographical Society in the UK. Web link: http://www.victoria.ac.nz/sgees/staff/mairead-deroiste.aspx

Mike Gibbs, Managing Director, Solutions 2 Access Ltd (Christchurch, New Zealand). Role in this project: Mike is a member of the Rowallan Alton Incorporation Committee and Rarakau Rainforest Carbon Project Steering Committee. He is also the Project Owner co-manager for this project. Professionally, Mike set up a forest restoration business 'Te Ngahere Ltd' in 1996 and has been involved in developing the company and all its internal systems. He left Auckland in 2003 to establish a branch in Christchurch and has run the branch since this time. Along with this Mike has been active in the field and his skills have evolved with the industry, he has a working knowledge of the standards and procedures required to complete the works and has a sound understanding of the companies' legal obligations. He has had 14 years experience in planning and executing projects in isolated and remote areas. Web link: http://www.solutions2.co.nz/

2.10 LAWS & REGULATIONS

Relevant laws and regulations relating to the project have been identified as follows:

- Forest Amendment Act (1993)
- Resource Management Act (1991)

There is no logging in the project scenario and so the Forests Amendment and the Resource Management Acts do not apply. There is no environmental impact assessment requirement for protecting indigenous forest in New Zealand and so the Resource Management Act also does not apply in this regard.

2.11 ENVIRONMENTAL IMPACT ASSESSMENT

An Environmental Impact Assessment is not required for forest carbon projects undertaken in the voluntary carbon market in New Zealand. This is because voluntary forest protection is a permitted activity under New Zealand law and local government legislation.

2.12 STAKEHOLDER COMMUNICATIONS

The Rarakau Rainforest Carbon Project has and will continue to operate the Project Consultation Protocol as defined in Section 9.1.3 of this PDD.

2.13 PROJECT TIMELINE

The Project Timeline elements for the Rarakau Rainforest Carbon Project are as follows:

a. **Project Period:** 50 years from 1 January 2009 till 31 December 2058 with an indefinite option to roll over for subsequent Project Periods.
b. **Forest Protection Period:** Starting no later than 3 months following project registration with the Markit Environmental Registry.
c. **Project Crediting Periods:** 5 yearly periods from 1 January 2009 till 31 December 2058.
d. **Project Management Periods:** Annual periods starting on 1 January 2009.
e. **Project Termination:** Currently scheduled for 31 December 2058, but with an indefinite option to roll over for subsequent Project Periods.

2.14 PERMANENCE

The Rarakau Rainforest Carbon Project is protected by means of a Memorandum of Encumbrance that protects the Eligible Forest Area from baseline activities for the duration of the Project Period. The Memorandum of Encumbrance is between the Project Owner and the Programme Operator.

The Memorandum of Encumbrance is a form of mortgage, recognised as such by the Property Law Act 2007 (PLA) and the Land Transfer Act 1952 (LTA). It is therefore capable of being registered against a project owner's land title. The undertakings recorded in it are binding on the owner for the time being of the land, including any successor in title. The primary reason for adopting a registrable encumbrance (separate from the Programme Agreement) is to ensure that the future land owners are bound to the project undertakings. In turn, this support claims as to the permanence of additional carbon stocks.

The Project Owner gives the following undertakings in the encumbrance in favour of the Programme Operator:

- To terminate and avoid all land management practices that impede the rate of carbon sequestration and threaten permanence of forest carbon stocks for the duration of the project.
- More specifically, (i) to avoid timber and fuel wood collection and harvesting, (ii) to terminate the use of fire as an agricultural management tool for land clearance in the project area and adjacent land, (iii) to stop others from doing the same, (iv) to only use fire for pasture management (e.g. burning stumps) under permit issued by the relevant Rural Fire Authority with jurisdiction over the Project Area, and (v) to implement a project implementation plan that reinforces these forest protections.
- To notify the Programme Operator of any carbon stock reversal or breach of the Encumbrance.
- To make payment or deliver eligible credits following a reversal or event of default when required under the Programme Agreement.
- To grant the Programme Operator and its agents access to the project area.

If the Project Owner (or a subsequent land owner) breaches these undertakings, the Programme Operator has a number of remedies arising from the Encumbrance. As beneficiary of the Encumbrance the Programme Operator may:

- Invoke the dispute resolution procedure described in the Encumbrance, which involves

mediation and arbitration.

- Seek equitable relief from the Courts such as an order of: (i) specific performance, compelling the project owner to honour the encumbrance, or (ii) an injunction, requiring a project owner to cease activities that breach its undertakings.
- Seek damages from the project owner, either via mediation, arbitration or the Courts, for any losses it suffers as a result of the project owner's breach, including any properly incurred costs arising from remedying the breach or being forced to pursue legal action.

In addition to its rights under the Encumbrance, the Programme Agreement records further remedies, which may be invoked in parallel. For example:

- If there is an avoidable reversal, the owner must compensate the buffer account with eligible credits equivalent to the level of the reversal (at verification), which are then retired from the buffer account.

- If there is an event of default (that is, the owner experiences an insolvency event or materially breaches the Programme Agreement and doesn't fix the breach), then, in addition to the reversal rules above: (i) the Programme Operator may suspend owner's participation in the Programme until further notice, take over project management, receive all credits, recover its extra costs by selling those credits, and hold any surplus credits aside pending owner reinstatement or termination; and (ii) The Programme Operator may either immediately, or during suspension, terminate the owner's participation, in which case the owner must deliver credits into the buffer account equivalent to the total volume of credits issued to the project, which are then retired.

Because the Memorandum of Encumbrance is technically a form of mortgage, a number of mortgagee rights provided by the PLA and the LTA are not appropriate in the context of the programme (e.g. example the right of a mortgagee to take possession of the land and sell it if the mortgagor defaults). The encumbrance document explicitly excludes these inappropriate remedies.

The Project Owner (Rowallan Alton Incorporation) has the right to restrict access to the Project Area to ensure that the behaviour of visitors to the Project Area is consistent with the objectives of the Rarakau Rainforest Carbon Project. The restriction of access can be implemented by means of visitor behaviour requirements imposed upon visitors as a condition of access. These visitor behaviour requirements will be communicated to visitors by means of prominently located and easily readable notices at the main road access boundary to the Project Area, the visitor car park, and the backpacker accommodation (lodge). Failure to comply with visitor requirements can be enforced by means of a notice of trespass issued by the Farm Manager, and subsequent recourse to the police. Visitor behaviour requirements specific to the Rarakau Rainforest Carbon Project shall be completed in the year following first verification and recorded in the Project Management Report of that year.

2.15 TRANSITION TO COMPLIANCE

The Rarakau Rainforest Carbon Project accepts the terms and conditions of the Rarakau Programme in relation to any change in the status of project forests from voluntary space to compliance space as a result of changes in international or domestic climate change policy.

2.16 PROJECT FINANCIAL MANAGEMENT

Project financial management is undertaken through a transparent revenue disbursement protocol that aligns with legal contracts between the financial stakeholders in the project. These are: Project Owner (Rowallan Alton Incorporation), Project Coordinator (Carbon Partnership) and Programme Operator and marketing and sales agent (Ekos).

Carbon Credit Monetisation

Ekos monetises Rarakau carbon credits through its retail and wholesale carbon trading platform.

The retail element comprises an e-commerce website targeting businesses and individuals seeking to offset their GHG emissions for carbon-related claims. The carbon credit retail marketing method focuses on providing carbon footprint measurement, reduction, offsetting and zero carbon certification services in the New Zealand voluntary zero carbon market. These services are provided for business operations and products for business customers, and flights and driving for individual customers.

Note that New Zealand has an Emissions Trading Scheme with large scale demand from compliance buyers with obligations to the government. But carbon credits certified under the international voluntary carbon market system are not fungible in the New Zealand Emissions Trading Scheme. Ekos, therefore, targets the New Zealand voluntary carbon offsets market.

Retail marketing focuses primarily on web search visibility through search engine optimisation and google ad words enabling potential customers to discover Ekos quickly when searching for carbon offsets in New Zealand. Ekos also uses mainstream media and social media marketing techniques including articles, press releases, and interviews for mainstream media, and regular posts and ad campaigns on Facebook (as well as supporting a Facebook following).

The wholesale sales element uses the same marketing presence to enable Ekos projects to be discoverable by resellers searching for New Zealand indigenous forest carbon credits.

Carbon Credit Revenue Disbursement

The mechanism and procedure for the receipt, holding and disbursement of carbon credit revenues is as follows: Ekos transacts carbon credit sales with carbon buyers. Ekos then disburses to the Project Owner and Project Coordinator. The proportion of funds allocated to the Project Owner and Project Coordinator is determined in the Project Budget and Pricing

spreadsheet (Appendix 6) and the Ekos sales register and aligns with agreements between the financial stakeholders (Project Agreement, Programme Agreement, License Agreement).

Ekos manages the carbon market registry account for this project and retires carbon credits when they are sold by Ekos directly to carbon offset consumers, and transferred to registry accounts when they are sold to carbon offset resellers.

Carbon revenue use and reinvestment by the Project Owner is managed by the Rowallan Alton Incorporation. Carbon revenue is allocated to carbon project management budgets as well as surpluses (timber opportunity cost) allocated to farm improvement and conservation enhancement. The benefit sharing arrangements for revenue allocated to the Project Owner have been determined by the Project Owner in consultation with Carbon Partnership (Project Coordinator).

2.17 PROJECT BUDGETS

The project budget is presented in the Project Budget and Pricing spreadsheet (Appendix 6).

2.18 EQUAL OPPORTUNITY

The project has a policy whereby project participants, including women and members of marginalised groups, are given an equal opportunity to fill employment positions in the project where job requirements are met or for roles where they can be cost-effectively trained. Note that this project currently does not employ any staff.

2.19 TRANSFERRAL OF PROJECT COORDINATION

If Carbon Partnership Ltd were to terminate or decide to transfer Project Coordinator activities to another entity it will seek the approval of the Project Owner and also the Plan Vivo Foundation. This will include a plan for execution of transfer needs to be submitted, that sets out how the transfer will be managed, including by providing necessary capacity building for new organization(s) and by gaining support of stakeholders including participating communities.

3. Identifying GHG Sources, Sinks and Reservoirs

The GHG sources, sinks and reservoirs used in the Rarakau Rainforest Carbon Project are those specified in the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018 as follows:

Table 3a: GHG Sources, Sinks, and Reservoirs: Rarakau Programme	
Sources	CO_2e emissions from above ground woody biomass removed from the forest.
	CO_2e emissions from above ground woody biomass entering the deadwood pool in the form of discarded crown and branches of harvested (target) trees.
	CO_2e emissions from additions to the above ground deadwood carbon pool resulting from collateral damage to non-target trees due to wood harvest activities.
	CO_2e emissions from the decomposition of below ground biomass resulting from above ground wood harvesting and collateral damage.
Sinks	CO_2e sequestered in the natural background rate of natural forest regeneration.
	CO_2e sequestered in harvest patches as a consequence of the opening the forest canopy.
Reservoirs	The GHG assessment in this project measures and estimates the change in carbon stocks contained in carbon reservoirs (and associated emissions and/or removals), rather than the total content of carbon stored in the forest carbon reservoirs/pools. Accordingly, the total volume of carbon stored in the above ground and below ground carbon pools is not measured in this methodology.

The GHG sources and sinks measured in this project are restricted to LULUCF carbon pools that are controlled by the Project Owners and lie within the Eligible Forest Area of the project.

The carbon pools used in this project are:

Table 3b: Carbon Pools Used in this Methodology		
Carbon Pool	Included/ Excluded	Justification
Above ground biomass (AGB)	Included	At a minimum, the stock change in the above-ground tree biomass shall be estimated.
Below ground biomass (BGB)	Included	When you kill a tree you also kill its roots. The New Zealand national compliance (Kyoto) forest carbon accounting system uses a BGB default value of 25% of AGB. The only exception to this default rule for this methodology applies to the following species that are known to be capable of regenerating from cut stumps: *Belschmedia tawa, Weimannia racemosa, Alectyron excelsum*, and *Corynocarpus laevigatis*. Project Developers shall identify the proportion of the above ground biomass emitted (ABGE) attributable to these four species in the Baseline, and remove the below ground biomass emitted (BGBE) portion for these species in the baseline calculation.

Dead-wood (DW)	Included	Required under VCS Tool for AFOLU Methodological Issues.
Harvested Wood Products	Excluded	Total baseline timber harvesting volumes permitted in New Zealand are very low per hectare per year, and the harvested wood product element of the baseline carbon pool is in this methodology deemed to be *de minimis*.
Litter	Excluded	Insignificant and exclusion is conservative.
Soil organic carbon	Excluded	Exclusion is always conservative when forests remain as forests.

The inclusion/exclusion of greenhouse gases in this methodology are shown in Table 3c.

Table 3c: Emission sources other than resulting from changes in stocks in carbon pools

Gas	Sources	Included / Excluded	Justification
Carbon dioxide (CO_2)	Included in carbon pools specified in Table 3b.	Included	As stated in Table 3b.
	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Removal of herbaceous vegetation	Excluded	Based on CDM EB decision reflected in paragraph 11 of the report of the 23rd session of the board: cdm.unfccc.int/Panels/ar/023/ar_023_rep.pdf
Methane (CH_4)	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Burning of biomass	Excluded	Exclusion is conservative.
Nitrous oxide (N_2O)	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Nitrogen based fertilizer	Excluded	No fertilizer is used in the baseline or the project scenario.
	Burning of biomass	Excluded	Potential emissions are not significant and conservatively neglected.

4. Determining The Baseline Scenario

The Baseline Scenario used in the Rarakau Rainforest Carbon Project is consistent with that specified in the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

4.1 BASELINE SELECTION, ADDITIONALITY AND BASELINE MODELLING

4.1.1 Selection of Baseline

The Baseline Activity for the Rarakau Rainforest Carbon Project has been approached in three ways:

1. Historical level of logging for the entire SILNA area (approximately 20,000m^3 of roundwood annually).[3]
2. The assumption via common practice that these lands would be harvested up to the amount allowed for in their SFM plans as long as they are economically feasible.
3. The Project Owner has undertaken baseline activities in the past and made preparations for undertaking further baseline activities in the form of preparing a timber harvesting and forest management plan in the form of a Sustainable Management Plan for their forested land parcels. These plans predated the initiation of this carbon project.

4.1.1.1 Identification of Possible Land Uses

Historically, SILNA land in Southland has been used in a number of ways:

- Selective logging timber harvest
- Clear felling and replanting with exotic trees (*Pinus radiata*) for timber harvesting
- Clear felling and conversion to pastoral farming
- Clear felling and left for natural regeneration
- Conservation

Because of the inaccessibility of the area, it is likely that the land uses above are the only relevant possible land uses. We have not found any evidence of other proposed land uses for the project area.

[3] Griffiths N.D. Managing NZ's Indigenous Forested Lands For Timber: An Update (page 5). Available here: http://www.nzwood.co.nz/images/uploads/file/PDFS/SFM/Griffiths.pdf

4.1.1.2 Assessment of Land Use Options

A high level assessment of the possible land uses is given in Table 22, which clearly shows that timber harvesting under a Sustainable Management Plan is the most likely land use for the Project Area for the Rarakau Rainforest Carbon Project.

Table 4.1.1.2. Land Use Assessment: Rarakau Rainforest Carbon Project

Land Use	Land Suitability	Technical Capacity	Economic Barriers	Institutional Constraints
Selective logging timber harvest	Very well suited	Good – historical activity	High transport costs	None (if under SFM Plan)
Exotic plantation forestry	Moderately well suited	Good – historical activity	High transport costs	Clear felling very unlikely to gain legal sanction at local government level
Pastoral farming	Possibly suited	Good – historical activity	High transport costs	Clear felling very unlikely to gain legal sanction at local government level
Clear felling and regrowth	Very well suited	Good – historical activity	High transport costs	Clear felling very unlikely to gain legal sanction at local government level
Forest Conservation	Very well suited	Marginal – no historical activity	No revenue source[4]	Purpose of the land is to provide economic well being to the owners and not to be a liability[10]

4.1.1.3 Land Suitability

The land is very well suited to any land use scenario involving indigenous forest because the forest has evolved to be suitable to the particular characteristics of the area. The area receives good rainfall, although exotic forests do require significantly more moisture than indigenous forests. The tree species *Pinus radiata* has been proven to be suitable throughout New Zealand, although the lower latitude of the area may result in lower growth rates than warmer New Zealand climatic regions such as Northland. Dairy farming is common in Southland across a range of soil types. While the rainfall level is good for pastoral farming in the area, the soil may suffer from erosion and the waterways from eutrophication. Some of the West Rowallan SILNA land has already been clear felled and used for exotic forestry and dairy farming.

[4] Conservation management would encompass a cost to the land owners.

4.1.1.4 Technical Capacity

Several different land uses have been undertaken in the project area in the past. This includes commercial logging, land clearance, pastoral farming, hunting and recreation. Southland has the infrastructural capacity for all of these activities, including timber mills, dairy farms, dairy processing plants, beef and lamb service industries.

4.1.1.5 Economic Barriers

All types of industry in the area face the economic barrier of high transport costs due to the inaccessible location of the area. Because this is a barrier for all land uses, the relative effect between the likelihood of the different possibilities is small. Conservation of the forest will not incur high transport costs but will receive no revenue.

4.1.1.6 Institutional Constraints

We are not aware of any institutional barriers to selective logging so long as the logging is undertaken within the rules of an approved Sustainable Forest Management Plan. The Government has provided the forest owners with funding to establish Sustainable Forest Management Plans. The main institutional constraint to the possible land uses is the application of the Resource Management Act 1991 by the Southland District Council via the Southland District Plan. This Plan imposes restrictions on logging indigenous forests, particularly in areas such as the West Rowallan forests because of their high conservation value. This is an absolute constraint that would very likely prevent clear felling of the forests. However, selective logging may be allowed. Furthermore, in discussions with the CEO and Group Manager Environment and Community for the Southland District Council in April 2010, they indicated that they would consider making timber harvesting (through a Sustainable Management Plan) a permitted activity under this jurisdiction.

Further to the economic barriers of forest conservation, the land was granted to its Maori owners for the purpose of providing a livelihood, which means that the owners consider the land as an asset rather than a liability. Therefore, the owners expect an economic return from the land. This is largely the reason that the land was exempted from Part 3A of the Forests Act 1949.

4.1.2 Justification of Selected Baseline

The use of the forests for timber harvesting under a Sustainable Management Plan is the most appropriate baseline for the Rarakau Rainforest Carbon Project because it is the only activity that fits within the regulatory environment and provides the owners with revenue under baseline activity conditions. According to an official from the Ministry of Agriculture and Forestry, land owners with a Sustainable Forest Management Plan typically harvest the maximum allowable amount of timber provided that it is economically feasible to do so. The subsection below explains how a test of economic feasibility will be applied to the baseline activity.

4.1.2.1 Commercially Viable Baseline

The Rarakau Rainforest Carbon Project undertook a financial cost-benefit analysis during the scoping phase of project development and as part of the additionality assessment. This financial cost-benefit analysis (available on request) showed that the baseline activity and scale of activity was economically viable at least up to the legally sanctioned volume of timber that could be extracted from the forests in the Project Area.

4.1.3 Justification for Excluding Alternative Baselines

The majority of potential baselines (other than legally sanctioned sustainable forest management wood harvesting) involve the clear-felling or unsustainable harvesting of indigenous forests. This clearly contravenes the objectives of the Southland District Plan and is therefore very unlikely to receive resource consent. The owners of the forests subject to the Rarakau Rainforest Carbon Project have, however, previously lodged a claim with the Waitangi Tribunal (the WAI 158 Claim[5]) seeking redress for loss of opportunity to clear-fell their forests and transform the lands into productive plantation forestry or farm lands consistent with the purpose of the original land grant under the SILNA legislation of 1906.

Should this claim be successfully resolved, either through the Waitangi Tribunal process or through direct intervention by the Crown, then two alternative baselines become possible:

1. Deforestation (i.e. change in land use)
2. Forest degradation through unsustainable timber harvesting (forest-remaining-as forest).

Deforestation: Deforestation is not permitted as a baseline activity under this methodology, because any deforestation (constituting a change in land use from forest to non-forest land uses) would shift these land parcels from Article 3.4 to Article 3.3 of the Kyoto Protocol (encompassing a deforestation liability to New Zealand under the Kyoto Protocol and now the Paris Agreement), and would thereby become subject the New Zealand national carbon accounting regime, and hence double counting (and ineligibility under this methodology). Deforestation of tall native forest is illegal under the Southland District Council interpretation of the Resource Management Act. Deforestation would also breach the Memorandum of Encumbrance on this land title which is one of the legal instruments of protection for this forest. In addition, the landowners have agreed to have the forest protected under a New Zealand Nature Heritage Covenant which imposes a permanent covenant over the land.

Forest Degradation: Forest degradation is permitted as a baseline activity in this methodology because the baseline activity constitutes a 'forest remaining as forest' activity, and the land parcels would remain in Article 3.4 of the Kyoto Protocol and therefore remain outside the New Zealand national Kyoto carbon accounting regime.

[5] See MAF 2009 for reference to the Wai 158 claim.

Forest Degradation in the form of diminishing carbon stocks through time, encompasses a potential Baseline Scenario, particularly for regenerating forest lands within the Project Area. Such lands can and do become subject to periodic anthropogenic disturbance that not only arrests natural succession but degrades the structure of the forest system through time. Forest degradation, however, is conservatively neglected in the baseline modelling in this methodology.

Due to the Wai 158 claim with the Waitangi Tribunal, deforestation and unsustainable rates of timber harvesting may become legally sanctioned at some point during the Project Period. Should this occur, the Rarakau Rainforest Carbon Project would be eligible for an adjustment of the Baseline Scenario and an increase in baseline GHG emissions, but only for baseline activities involving unsustainable logging rates, where the baseline activity is a forest-remaining-as-forest activity.

Note that the Rarakau Programme Methodology specifies that the baseline and project activities must constitute forest remaining as forest activities, and thereby remain within Article 3.4 of the Kyoto Protocol (or equivalent in a post-2012 agreement).

The successful resolution of the WAI 158 Claim on behalf of the Claimants would not cause the Project Owners to withdraw from the Rarakau Programme in order to pursue a deforestation baseline. Instead the Project Owners would pursue an adjusted baseline at the decadal timeframe for baseline revisions as specified in Section 4.1.2.1 of the Rarakau Programme Methodology D2.1v1.0, 15 May 2012.

The unsustainable rate of (revised) baseline harvesting would be consistent with what was common practice timber harvesting rates for high intensity (unsustainable) selective logging in areas where this was legally sanctioned prior to the 1993 Forest Amendment Act, and/or prior to rulings under the Resource Management Act that prevented harvesting rates above those specified in the Forest Amendment Act (1993).

4.1.4 Stratification

The Project Area contains different forest types and as such stratification was necessary. This project is subject to two types of stratification for baseline and project GHG accounting:

1. Forest composition stratification
2. Forest management stratification

4.1.4.1 – Forest Composition Stratification

This information is provided in the timber harvest rate information provided in the Sustainable Forest Management Plan for the Rarakau Rainforest Carbon Project Baseline Activity (Appendix 3 and 21 – see pages 17, 18, and 24 of Appendix 21).

4.1.4.2 – Forest Management Stratification

These strata are specified in the Sustainable Forest Management Plans (Appendix 3 and 21), and the baseline GHG information (Section 7 below).

4.1.5 Additionality

This PD uses the Additionality test specified in the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. The information provided below shows that there is reasonable justification that the project qualifies in each step.

4.1.5.1 Step I – Regulatory Surplus

There are two pieces of regulation that are relevant to this project:

- Forests Act (1949)
- Resource Management Act (1991)

The Forests Act of 1949 prohibits clear felling of indigenous forest except for special circumstances such as for the purpose of constructing a roadway. However, timber may be harvested from indigenous forests within a Sustainable Forest Management Plan. A Sustainable Forest Management (SFM) Plan is a plan that specifies a limited rate of harvest that maintains the sustainable integrity of the native ecosystem and is approved by the Government as such.

In addition, specified Maori-owned land is excluded from the ban on clear felling, which includes SILNA land. The Minister may revoke this exception on a block-by-block basis if the owners voluntarily agree to it. In the past the Government has offered compensation to land owners to voluntarily cede their right to clear fell the land.

Whether the areas of this project can be clear felled or only selectively logged under a SFM Plan, it is clear that the Forests Act 1949 does not mandate the total preservation of the forests and the complete cessation or avoidance of timber harvest from indigenous forests. Although SILNA lands may be clear felled (unless the owners have voluntarily ceded this right) within the law of the Forests Act 1949, the Environment Court Decision C68/94 (Waitutu Inc V Southland District Council) established that the Resource Management Act (1991) applies to SILNA land, and therefore the District Plan is binding on this land[6].

The Resource Management Act 1991 gives local territorial authorities (District Councils, City Councils, Regional Councils and Unitary Authorities) the authority to establish a plan that categorises various activities as being permitted, banned, permitted with certain constraints, or permitted only upon the judgement of the local authority or Environment Court. All of the areas in the Rarakau Rainforest Carbon Project fall within the boundary of the Southland

[6] Environment Court Decision C68/94available on request.

District Plan. The relevant Section of the Plan (Section 3.4) places restrictions on the harvest of indigenous forests. Specifically, Rule HER.3 – Indigenous Flora and Fauna[7] states:

1. *No person shall carry out any activity which involves the clearance, modification, damage, destruction or removal of indigenous vegetation or habitats of indigenous fauna otherwise than in accordance with this plan.*

A Southland District Council decision 60/3/99/91 (1999)[8] states that a notified resource consent application would be required to undertake commercial timber harvesting in the SILNA forests of western Southland, even when proposed under the sustainable forest management plan rules of Part 3a of the Forests Act.

4.1.5.2 Step II – Implementation Barriers

The proposed IFM-LtPF project subject to this PD faces both investment barriers and institutional barriers.

The owners of the SILNA land will look to maximise the ongoing income from the natural resources of the land. Without carbon finance, this may be from selective logging under a Sustainable Forest Management plan. This option offers revenue for the owners, while the option of preserving the forest from any harvesting and allowing it to naturally regenerate to a mature state will not provide any revenue to the owner other than the revenue from selling voluntary carbon credits[9].

The history of SILNA land is an institutional barrier to the project (avoidance of timber harvest). The SILNA land was given to Maori as compensation for earlier Crown confiscation of Maori land. This transfer of land was formed by the South Island Landless Natives Act 1906. The Act was later repealed, however, much SILNA land remains in the ownership of the descendants of the original benefactors of the Act, such as the areas included in this proposed project.

In the South Island Landless Natives Act 1906 the term 'landless natives' is defined as: *"Landless Natives" means Maoris in the South Island who are not is possession of sufficient land to provide for their support and maintenance, and includes half-castes and their descendants."*

From this definition and the context of the Act it is clear and commonly understood that the purpose of the SILNA land was to provide a livelihood for its owners. In particular, it is generally considered that this livelihood would be borne from the forestry or agricultural industries. Therefore, despite the recognised environmental benefits of protecting the forests, the owners of the forests consider the lands as an asset to earn the owners a living. This

[7] Appendix 2.

[8] Appendix 11.

[9] This assumes that the areas are too inaccessible to gain significantly from eco-tourism ventures, and does not account for alternative offset markets, such as biodiversity offsets.

proposed project, in the absence of voluntary carbon finance, would make the land a liability for its owners, which would contravene the purpose of the land ownership.

4.1.5.3 Step III – Common Practice

Under the GHG Protocol for Project Accounting, it is appropriate for the boundary of the areas considered for common practice to be similar in nature, including their regulatory environment. Therefore, it is most appropriate for the boundary to be of indigenous forested SILNA lands in the Southland District. In addition, the boundary could be limited to forests that are economic to harvest. However, it would be impossible to assess the economic viability of all relevant forests, so this will instead be inherently assumed in this additionality section (i.e. project is only additional if the caveat is met that timber harvesting is economic) and will be dealt with in the baseline emissions section (i.e. only economically viable harvests are included in the baseline).

A Government official from The New Zealand Ministry for Primary Industries (MPI) who specialises in the New Zealand indigenous forestry sector has advised that forest owners with SFM Plans typically harvest up to the amount allowed for under their plan as long as the price for timber makes it profitable to do so. Specifically, a senior MPI official (Alan Griffiths) stated in correspondence[10] with the Project Developer that forest owners with an SFM Plan:

> *Species that are in demand and which fetch a price sufficient to cover harvesting and management costs along with a profit, are likely to be harvested at or close to their approved sustainable rates. Traditionally, rimu is one such example.*

The common practice in SILNA lands is deforestation and forest degradation, as proven by the extremely small proportion of SILNA land that continues to support unlogged indigenous forest. Of the 57,000 hectares of SILNA land, only 8,000 is estimated to be unlogged indigenous forest, while 9,000 hectares is second growth or modified forests and the remaining 40,000 hectares have been deforested[11]. For example, Rowallan Alton Incorporation SILNA land (a subset of the Project Area in this project) has little or no unlogged forest remaining. Due to the regulatory environment, SFM is the most likely form of economic development that takes place on SILNA lands still supporting indigenous forests.

[10] Appendix 12.

[11] From the report 'SILNA forests: Review of the 2002 SILNA policy and the implementation package' (MAF 2009).

5. Baseline Scenario GHG Sources, Sinks and Reservoirs

The baseline GHG sources, sinks and reservoirs used in the Rarakau Rainforest Carbon Project are those specified in the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018 as follows:

Table 5a: GHG Sources, Sinks, and Reservoirs: Rarakau Programme	
Sources	CO_2e emissions from above ground woody biomass removed from the forest.
	CO_2e emissions from above ground woody biomass entering the deadwood pool in the form of discarded crown and branches of harvested (target) trees.
	CO_2e emissions from additions to the above ground deadwood carbon pool resulting from collateral damage to non-target trees due to wood harvest activities.
	CO_2e emissions from the decomposition of below ground biomass resulting from above ground wood harvesting and collateral damage.
Sinks	CO_2e sequestered in the natural background rate of natural forest regeneration.
	CO_2e sequestered in harvest patches as a consequence of the opening the forest canopy.
Reservoirs	The GHG assessment in this project measures and estimates the change in carbon stocks contained in carbon reservoirs (and associated emissions and/or removals), rather than the total content of carbon stored in the forest carbon reservoirs/pools. Accordingly, the total volume of carbon stored in the above ground and below ground carbon pools is not measured in this methodology.

The GHG sources and sinks measured in this project are restricted to LULUCF carbon pools that are controlled by the Project Owners and lie within the Eligible Forest Area of the project.

The carbon pools used in this project are:

Table 5b: Carbon Pools Used in this Methodology		
Carbon Pool	Included/ Excluded	Justification
Above ground biomass (AGB)	Included	At a minimum, the stock change in the above-ground tree biomass shall be estimated.
Below ground biomass (BGB)	Included	When you kill a tree you also kill its roots. The New Zealand national compliance (Kyoto) forest carbon accounting system uses a BGB default value of 25% of AGB. The only exception to this default rule for this methodology applies to the following species that are known to be capable of regenerating from cut stumps: *Belschmedia tawa, Weimannia racemosa, Alectyron excelsum*, and *Corynocarpus*

		laevigatis. Project Developers shall identify the proportion of the above ground biomass emitted (ABGE) attributable to these four species in the Baseline, and remove the below ground biomass emitted (BGBE) portion for these species in the baseline calculation.
Dead-wood (DW)	Included	Required under VCS Tool for AFOLU Methodological Issues.
Harvested Wood Products	Excluded	Total baseline timber harvesting volumes permitted in New Zealand are very low per hectare per year, and the harvested wood product element of the baseline carbon pool is in this methodology deemed to be *de minimis*.
Litter	Excluded	Insignificant and exclusion is conservative.
Soil organic carbon	Excluded	Exclusion is always conservative when forests remain as forests.

The inclusion/exclusion of greenhouse gases in this methodology are shown in Table 3c.

Table 5c: Emission sources other than resulting from changes in stocks in carbon pools

Gas	Sources	Included / Excluded	Justification
Carbon dioxide (CO_2)	Included in carbon pools specified in Table 3b.	Included	As stated in Table 3b.
	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Removal of herbaceous vegetation	Excluded	Based on CDM EB decision reflected in paragraph 11 of the report of the 23rd session of the board: cdm.unfccc.int/Panels/ar/023/ar_023_rep.pdf
Methane (CH_4)	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Burning of biomass	Excluded	Exclusion is conservative.
Nitrous oxide (N_2O)	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Nitrogen based fertilizer	Excluded	No fertilizer is used in the baseline or the project scenario.
	Burning of biomass	Excluded	Potential emissions are not significant and conservatively neglected.

6. Selecting Relevant Baseline GHG Emissions and Removals

The relevant sources, sinks and reservoirs relevant to the Baseline GHG Emissions and Removals are consistent with that specified in Section 6 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018 as follows:

Table 6a: GHG Sources, Sinks, and Reservoirs: Rarakau Programme	
Sources	CO_2e emissions from above ground woody biomass removed from the forest.
	CO_2e emissions from above ground woody biomass entering the deadwood pool in the form of discarded crown and branches of harvested (target) trees.
	CO_2e emissions from additions to the above ground deadwood carbon pool resulting from collateral damage to non-target trees due to wood harvest activities.
	CO_2e emissions from the decomposition of below ground biomass resulting from above ground wood harvesting and collateral damage.
Sinks	CO_2e sequestered in the natural background rate of natural forest regeneration.
	CO_2e sequestered in harvest patches as a consequence of the opening the forest canopy.
Reservoirs	The GHG assessment in this project measures and estimates the change in carbon stocks contained in carbon reservoirs (and associated emissions and/or removals), rather than the total content of carbon stored in the forest carbon reservoirs/pools. Accordingly, the total volume of carbon stored in the above ground and below ground carbon pools is not measured in this methodology.

The GHG sources and sinks measured in this project are restricted to LULUCF carbon pools controlled by the Project Owners and lie within the Eligible Forest Area of the project. The carbon pools used in this project are:

Table 6b: Carbon Pools Used in this Methodology		
Carbon Pool	Included/ Excluded	Justification
Above ground biomass (AGB)	Included	At a minimum, the stock change in the above-ground tree biomass shall be estimated.
Below ground biomass (BGB)	Included	When you kill a tree you also kill its roots. The New Zealand national compliance (Kyoto) forest carbon accounting system uses a BGB default value of 25% of AGB. The only exception to this default rule for this methodology applies to the following species that are known to be capable of regenerating from cut stumps: *Belschmedia tawa, Weimannia racemosa, Alectyron excelsum*, and *Corynocarpus laevigatis*. Project Developers shall identify the

		proportion of the above ground biomass emitted (ABGE) attributable to these four species in the Baseline, and remove the below ground biomass emitted (BGBE) portion for these species in the baseline calculation.
Dead-wood (DW)	Included	Required under VCS Tool for AFOLU Methodological Issues.
Harvested Wood Products	Excluded	Total baseline timber harvesting volumes permitted in New Zealand are very low per hectare per year, and the harvested wood product element of the baseline carbon pool is in this methodology deemed to be *de minimis*.
Litter	Excluded	Insignificant and exclusion is conservative.
Soil organic carbon	Excluded	Exclusion is always conservative when forests remain as forests.

The inclusion/exclusion of greenhouse gases in this methodology are shown in Table 3c.

Table 6c: Emission sources other than resulting from changes in stocks in carbon pools

Gas	Sources	Included / Excluded	Justification
Carbon dioxide (CO_2)	Included in carbon pools specified in Table 3b.	Included	As stated in Table 3b.
	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Removal of herbaceous vegetation	Excluded	Based on CDM EB decision reflected in paragraph 11 of the report of the 23rd session of the board: cdm.unfccc.int/Panels/ar/023/ar_023_rep.pdf
Methane (CH_4)	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Burning of biomass	Excluded	Exclusion is conservative.
Nitrous oxide (N_2O)	Combustion of fossil fuels (in vehicles, machinery and equipment)	Excluded	Covered by Kyoto carbon accounting in New Zealand and therefore would be double counted if included.
	Nitrogen based fertilizer	Excluded	No fertilizer is used in the baseline or the project scenario.
	Burning of biomass	Excluded	Potential emissions are not significant and conservatively neglected.

7. Quantifying Baseline GHG Emissions and Removals

7.1 BASELINE SCENARIO GHG EMISSIONS AND REMOVALS

The calculation of Baseline Scenario GHG emissions and removals for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. This particular baseline calculation is subject to a baseline revision as required by the original Rarakau Programme Methodology, the original PD and the Plan Vivo Standard.

The Rarakau Rainforest Carbon Project baseline scenario data is based on the annual allowable timber harvest rate for each land parcel as stated in a Sustainable Forest Management Plan timber harvesting assessment provided in Appendix 3 and 21 (see pages 17, 18 and 24 of Appendix 21).

Table 7.1. Evidence Requirement: Baseline Scenario GHG Emissions/Removals		
#	Name/Description	Location
7.1a	Sustainable Management Plan/Permit Application data concerning the annual allowable timber harvest rate (m^3) for each land parcel.	Appendix 3 and 21

7.1.1 Harvest Rate (HR)

The calculation of the Harvest Rate (HR) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. The HR component of the baseline carbon accounting for the Rarakau Rainforest Carbon Project derives values from the Forest Management Plans for baseline timber harvesting for beech and podocarp species types (provided in Appendix 3 and 22). The HR is calculated conservatively as 60% of the assessed annual increment into the harvestable boles (excluding branches and crown) for each timber species for which there is sufficient standing volume to justify commercial harvesting (MAF 2002). The HR is measured in $m^3\ ha^{-1}\ yr^{-1}$.

The HR represents the harvested wood volume remaining after the crown and branches have been removed, and is calculated as a percentage of gross volume increment. The gross volume increment is calculated using a size class model for each forest/timber species type. Three timber species types are used in this methodology: beech, podocarp, and broadleaf. These three timber species types correspond to the three predominant indigenous forest types in New Zealand. The gross volume size increment per hectare for each size class is determined by multiplying the mean stem volume by the density change, then multiplied by the total area

hectare figure to give the total gross volume increment per year for each size class. The total is then reduced by 40% (MAF 2002) to:

a. Allow for the proportion of natural mortality that is unlikely to be recovered through harvesting in a mixed-aged natural forest.
b. Allow for some trees to grow through the size classes to reach maturity and allows for the retention of habitat trees.
c. Take sufficient account of terrain and topography that would impede timber harvesting in the forest even when such terrain and topography has been accounted for in the delimiting of the Operational Forest Area (OFA – equivalent to the Eligible Forest Area).

HR is calculated using the following equation:

Equation 7.1.1: $HR = HR_{BC} + HR_{PC} + HR_{BL}$

Parameters

HR	Timber Harvest Rate all species within OFA ($m^3\ yr^{-1}$)
HR_{BC}	Timber Harvest Rate beech within OFA ($m^3\ yr^{-1}$)
HR_{PC}	Timber Harvest Rate podocarp within OFA ($m^3\ yr^{-1}$)
HR_{BL}	Timber Harvest Rate broadleaf within OFA ($m^3\ yr^{-1}$)

Therefore: $HR = HR_{BC} + HR_{PC} + HR_{BL} = 180 + 32.3 + 0 = 212\ m^3\ yr^{-1}$, and is presented in Appendix 6.

7.1.2 Total Wood Harvested (TWH)

The calculation of Total Wood Harvested (TWH) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

The calculation of the TWH for the Rarakau Rainforest Carbon Project uses the HR totals for the beech and podocarp species types and uses the following equations:

Equation 7.1.2a: $TWH = TWH_{BC} + TWH_{PC} + TWH_{BL}$

Parameters

TWH	Total Wood Harvested all species within OFA ($m^3\ yr^{-1}$)
TWH_{BC}	Total Wood Harvested beech within OFA ($m^3\ yr^{-1}$)
TWH_{PC}	Total Wood Harvested podocarp within OFA ($m^3\ yr^{-1}$)
TWH_{BL}	Total Wood Harvested broadleaf within OFA ($m^3\ yr^{-1}$)

And,

Equation 7.1.2b:

$$TWH_{BC} = HR_{BC} \div 0.34$$

$$TWH_{PC} = HR_{PC} \div 0.80$$

$$TWH_{BL} = HRBL \div 0.80$$

Parameters

HR_{BC}	Harvest Rate (beech) within OFA at start of Project Period ($m^3\ ha^{-1}\ yr^{-1}$)
HR_{PC}	Harvest Rate (podocarp) within OFA at start of Project Period ($m^3\ ha^{-1}\ yr^{-1}$)
HR_{BL}	Harvest Rate (broadleaf) within OFA at start of Project Period ($m^3\ ha^{-1}\ yr^{-1}$)
TWH_{BC}	Total Wood Harvested beech within OFA ($m^3\ yr^{-1}$)
TWH_{PC}	Total Wood Harvested podocarp within OFA ($m^3\ yr^{-1}$)
TWH_{BL}	Total Wood Harvested broadleaf within OFA ($m^3\ yr^{-1}$)

Therefore: TWH = (180 ÷ 0.34) + (32.3 ÷ 0.80) + (0 ÷ 0.80) = 569 $m^3\ yr^{-1}$, and is presented in Appendix 6/Rarakau Carbon tab, cell D4.

This represents a baseline revision compared with validation of this project in 2013 under the ISO14064-2 standard. This revision takes the actual conversion rate of harvest volume to total recoverable volume for forests within the project area and within the project reference area. This was calculated as the average percentage of harvest volume to total recoverable volume for all forest inventory data for the Rowallan Alton area. This calculation is located in Appendix 6/Rarakau PHI tab columns S-AH.

7.1.3 Collateral Damage (CD)

The calculation of Collateral Damage (CD) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.3 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

Collateral Damage (CD) is calculated using the following equation:

Equation 7.1.3:

$$CD = TWH \times 0.10$$

Parameters

CD	Collateral damage within OFA ($m^3\ yr^{-1}$)
TWH	Total Wood Harvested within OFA ($m^3\ yr^{-1}$)

Therefore: CD = 569 x 0.1 = 57 $m^3\ yr^{-1}$, and is presented in Appendix 6/Rarakau Carbon tab, cell D5.

7.1.4 Above Ground Biomass Emitted (AGBE)

The calculation of Above Ground Biomass Emitted (AGBE) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.4 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

AGBE is calculated using the following equation:

Equation 7.1.4: $ABGE = TWH + CD$

Parameters

AGBE	Above ground biomass emitted within OFA ($m^3\ yr^{-1}$)
CD	Collateral damage within OFA ($m^3\ yr^{-1}$)
TWH_{TOT}	Total Wood Harvested all species within OFA ($m^3\ yr^{-1}$)

Therefore: AGBE = 569 + 57 = 626 $m^3\ yr^{-1}$ and is presented in Appendix 6/Rarakau Carbon tab, cell D6.

7.1.5 Below Ground Biomass Emitted (BGBE)

The calculation of Below Ground Biomass Emitted (BGBE) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.5 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

BGBE is calculated using the following equation:

Equation 7.1.5: $BGBE = ABGE \times 0.25$

Parameters

BGBE	Below ground biomass emitted within OFA ($m^3 yr^{-1}$)
AGBE	Above ground biomass emitted within OFA ($m^3\ yr^{-1}$)

Therefore: BGBE = 626 x 0.25 = 156 $m^3\ yr^{-1}$ and is presented in Appendix 6/Rarakau Carbon tab, cell D7.

7.1.6 Total Emitted Wood Volume in Cubic Metres (TM3)

The calculation of Total Emitted Wood Volume in Cubic Metres (TM3) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.6 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

TM3 is calculated using the following equation:

Equation 7.1.6: $TM3 = AGBE + BGBE$

Parameters

TM3	Total emitted wood volume in cubic meters within OFA ($m^3 yr^{-1}$)
AGBE	Above ground biomass within OFA ($m^3\ yr^{-1}$)
BGBE	Below ground biomass within OFA ($m^3\ yr^{-1}$)

Therefore: TM3 = 626 + 156 = 782 $m^3\ yr^{-1}$ and is presented in Appendix 6/Rarakau Carbon tab, cell D8.

7.1.7 Gross Total Emissions in tCO_2 (GTCO2)

The calculation of Gross Total Emissions in tCO_2 (GTCO2) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.7 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

GTCO2 is calculated using the following equation:

Equation 7.1.7d: $GTCO2 = ((TM3_{m3} \times 0.49) \times 0.5) \times 3.66$

Parameters

GTCO2	Total CO_2-e emissions within OFA ($tCO_2e\ yr^{-1}$)
$TM3_{m3}$	Total emitted wood volume in cubic meters within OFA ($m^3\ yr^{-1}$)
0.49	Density (t/m^3)
0.5	Carbon proportion of dry biomass
44/12	Mass ratio of CO_2e to C

Therefore: GTCO2 = ((782 x 0.49) x 0.5) x 3.66 = 701 $tCO_2\ yr^{-1}$ and is presented in Appendix 6/ Rarakau Carbon tab, cell D9.

7.1.8 Gross Baseline Emissions (GBE)

Gross baseline emissions (GBE) is calculated by subtracting the removals sequestered into the long-term Wood Products pool (ltWP) from GTCO2 and is represented in the following equation:

Equation 7.1.8: $GBE = GTCO2 - ltWP$

Parameters

GTCO2	Gross Total CO_2e emissions within EFA ($tCO_2e\ yr^{-1}$)
ltWP	Sequestration into long term Wood Products pool ($tCO_2e\ yr^{-1}$)

Therefore GBE = 701 - 17 = 684 $tCO_2\ yr^{-1}$. This calculation is presented in Appendix 6/ Rarakau Carbon tab, cell D10.

7.1.9 Sequestration into Long Term Wood Products Pool (ItWP)

ItWP is calculated using the equation:

Equation 7.1.9:

$$C_{WP,i} = \sum_{ty=s,w,oir,p,o} C_{XB,ty,i} * (1 - WW_{ty}) * (1 - SLF_{ty}) * (1 - OF_{ty})$$

Parameters

$C_{WP,i}$	Carbon stock in long-term wood products pool (stock remaining in wood products after 100 yrs) from stratum *i* post harvest in Rotation 1; ($tCO_2e\ ha^{-1}$)
$C_{XB,ty,i}$	Mean stock of extracted biomass carbon by class of wood product *ty* from stratum *i*; ($tCO_2e\ ha^{-1}$)
WW_{ty}	Wood waste. The fraction immediately emitted through mill inefficiency by class of wood product *ty*; dimensionless
SLF_{ty}	Fraction of wood products that will be emitted to the atmosphere within 5 years of timber harvest by class of wood product *ty*; dimensionless
OF_{ty}	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest by class of wood product *ty*; dimensionless
ty	Wood product class – defined here as sawnwood (s), wood-based panels (w), other industrial roundwood (oir), paper and paper board (p), and other (o)
i	*1,2,3,...M*strata

ItWP = 17 $tCO_2\ yr^{-1}$. This was calculated in Appendix 6/ Rarakau Carbon tab, cell N26. The calculations applying this methodology are shown in cells F17 to N26 on that sheet.

7.1.10 Net Baseline Emissions Avoided (NBEA)

The calculation of Net Baseline Emissions Avoided (NBEA) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.1.8 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

Net Baseline Emissions (NBE) is calculated by the following equation:

Equation 7.1.10: NBEA = (GTCO2 - Total (Cwp,I,tot)) ÷ 2

Parameters

NBEA	Net baseline emissions avoided within OFA ($tCO_2e\ yr^{-1}$)
GBE	Gross baseline emissions within OFA ($tCO_2e\ yr^{-1}$)
GTCO2	Gross total baseline CO2 emissions within OFA ($tCO_2e\ yr^{-1}$)
Total (Cwp,I,tot)	Total CO2 sequestered to the harvested wood products pool within OFA ($tCO_2e\ yr^{-1}$)

Therefore: NBEA = (701 - 17) ÷ 2 = 342 $tCO_2\ yr^{-1}$ and is presented in Table 7.1.9 and Appendix 6/ Rarakau Carbon tab, cell D11.

Total CO2 sequestered into the harvest wood product pool Total (Cwp,I,tot) is calculated using the VCS tool for calculating carbon sequestered into the wood product pool. This calculation is presented in Appendix 6/ Rarakau Carbon tab, cells F19-F26 and N19-N26 inclusive.

7.2 PROJECT GHG EMISSIONS AND REMOVALS

7.2.1 Net Project Removals (NPR)

The calculation of Net Project Removals (NPR) for the Rarakau Rainforest Carbon Project follows the specific methodological elements contained in Section 7.2.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. Net Project Removals (NPR) for the Rarakau Rainforest Carbon Project is equal to Enhanced Removals (ER) because there are no Project Activity Emissions (PAE) in this project (because PAE lie outside the accounting boundary of the Rarakau Programme). Enhanced Removals (ER) for the Rarakau Rainforest Carbon Project were calculated for beech-dominated forest in each land parcel using the specific methodological elements contained in Section 7.2.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

Net Project Emissions (NPR) is calculated by the following equation:

Equation 7.2.1: $NPR = \sum NPR_{BC} + \sum NPR_{PC,} + \sum NPR_{BL}$

Parameters

NPR	Net Project Removals Total within OFA ($tCO_2e\ yr^{-1}$) –ve number to denote removal
$\sum NPR_{BC}$	Sum of Net Project Removals for beech-dominated land parcel within OFA = OFA_{LF} x MSR_{BC} ($tCO_2e\ yr^{-1}$) –ve number to denote removal
$\sum NPR_{PC}$	Sum of Net Project Removals for podocarp-dominated land parcel within OFA = OFA_{LF} x MSR_{PC} ($tCO_2e\ yr^{-1}$) –ve number to denote removal
$\sum NPR_{BL}$	Sum of Net Project Removals for broadleaf-dominated land parcel within OFA = OFA_{LF} x MSR_{BL} ($tCO_2e\ yr^{-1}$) –ve number to denote removal
MSR_{BC}	Mean sequestration rate for beech-dominated forest ($tCO_2e\ yr^{-1}$) –ve number to denote removal
MSR_{PC}	Mean sequestration rate for podocarp-dominated forest ($tCO_2e\ yr^{-1}$) –ve number to denote removal
MSR_{BL}	Mean sequestration rate for broadleaf-dominated forest ($tCO_2e\ yr^{-1}$) –ve number to denote removal

NPR is calculated for the Rarakau Rainforest Carbon Project as 2,730 $tCO_2\ yr^{-1}$ and is presented in Appendix 6/ Rarakau Carbon tab, cell D15.

7.2.2 Enhanced Removals Window (ERW)

The Enhanced Removals Window for the Rarakau Rainforest Carbon Project was calculated using the specific methodological elements contained in Section 7.2.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. ERW for the Rarakau Rainforest Carbon Project is the period between 1990 and 2120. This encompasses Project Period 1 (2009 – 2058), Project Period 2 (2059 – 2108), and part of Project Period 3 (2109 – 2120).

7.3 PROJECT LEAKAGE

7.3.1 Total Activity Shifting Leakage (TAL)

Total Activity Shifting Leakage (TAL) was calculated for the Rarakau Rainforest Carbon Project using the specific methodology elements contained in Section 7.3.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

There is no leakage due to activity shifting within lands controlled by the Project Owner for the Rarakau Rainforest Carbon Project. This is because the lands controlled by the Project Owner comprise all of the land parcels subject to this PD.

The Project Owner has control only over resource use in the Project Area and has no access to other forest resources, and as such their leakage attributable to activity shifting is zero. The only type of leakage emissions calculated is GHG emissions due to market effects that result from project activity.

Table 7.3.1. Evidence Requirement: Leakage – Activity Shifting

#	Name/Description	Location
7.3.1a	Activity shifting leakage assessment as per GreenCollar IFM LtPF v1.0 VCS approved Methodology VM0010 (2011).	It is not possible for the Rarakau Rainforest Carbon Project to undertake Activity Shifting Leakage because all forest owned by the Project Owner is contained in this project.

7.3.2 Total Market Leakage (TML)

Total Market Leakage (TML) was calculated for the Rarakau Rainforest Carbon Project using the specific methodology elements contained in Section 7.3.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

The VCS AFOLU guidelines for leakage require that the Leakage Factor selected is based on the location where the forestry activity is "likely to be shifted". The Rarakau Rainforest Carbon

Project will have a leakage factor from market effects of zero because the response to any change in the market will most likely come from the international sector.

The supply of indigenous hardwood in New Zealand is very small and limited because there are strict conditions on the harvest and use of native timber. The price elasticity of supply of native hardwood is extremely inelastic at the current price, with little or no additional native hardwood likely to be available for harvest to respond to a very small increase in price. In addition, only a negligible amount of exotic hardwood is grown commercially in New Zealand. The domestic supply response is also reduced by the availability of recycled native hardwood timber from demolition projects. New Zealand imports a significant amount of hardwood, particularly from Indonesia. It is this import of hardwood that would form the most likely supply response to any change in the market.

The baseline scenario involves the commencement of logging, so there is no significant sunk-cost investment in local infrastructure such as timber mills to support a preference for local rough-cut logs over imported timber.

Total Market Leakage is calculated using the following equation:

Equation 7.3.2: $TML = NBEA \times MLF$

Parameters	
TML	Total market leakage ($tCO_2e\ yr^{-1}$)
NBEA	Net baseline emissions avoided ($tCO_2e\ yr^{-1}$)
MLF	Market leakage factor

Therefore: TML = 342 x 0 = 0 $tCO_2e\ yr^{-1}$

7.3.3 Total Leakage (TLK)

Total Leakage (TLK) was calculated for the Rarakau Rainforest Carbon Project using the using the specific methodology elements contained in Section 7.3.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. TLK for the Rarakau Rainforest Carbon Project is 0.

Total Leakage (TLK) is calculated as:

Equation 7.3: $TLK = TAL + TML$

Parameters	
TLK	Total leakage ($tCO_2e\ yr^{-1}$)
TAL	Total activity shifting leakage ($tCO_2e\ yr^{-1}$)
TML	Total market leakage ($tCO_2e\ yr^{-1}$)

Therefore: TLK = 0 + 0 = 0 $tCO_2e\ yr^{-1}$

8. Project GHG Emission Reductions and Removal Enhancements

8.1 NET GREENHOUSE GAS EMISSION REDUCTIONS

8.1.1 Net Project Benefits (NPB)

Net Project Benefits (NPB) was calculated for the Rarakau Rainforest Carbon Project using the specific methodological elements contained in Section 8.1.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

Net Project Benefits (NPB) is calculated as:

Equation 8.1: $NPB = NPR - TLK$

Parameters	
NPB	Net project benefits within OFA ($tCO_2e\ yr^{-1}$)
NPR	Net project removals within OFA ($tCO_2e\ yr^{-1}$)
TLK	Total leakage ($tCO_2e\ yr^{-1}$)

Therefore: NPB = 2,730 – 0 = 2,730 tCO_2e. See spreadsheet in Appendix 6/Rarakau Carbon tab, Cell D18.

8.2 NON-PERMANENCE RISK

Non-permanence risk is calculated for the Rarakau Forest Carbon Project using the specific methodological elements contained in Section 8.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

8.2.1 Internal Risk

The Rarakau Forest Carbon Project Internal Risk Assessment was undertaken using the VCS AFOLU Non-Permanence Risk Tool, v3.0 (2011) for Internal Risk. The risk categories for internal risk assessment are:

- Internal Risk 1: Project Management Risk
- Internal Risk 2: Financial Viability Risk
- Internal Risk 3: Opportunity Cost Risk
- Internal Risk 4: Project Longevity

Project Management Risk

The Rarakau Forest Carbon Project is co-managed by the Project Owner and the Project Developer (Carbon Partnership Ltd). There is no encroachment onto the Rowallan Alton Incorporation estate that affects the forests subject to this proposal. A land manager lives on the farm that is part of the Rowallan Alton Incorporation estate. The car park at the Rowallan Alton Incorporation estate is used as a public access point to the Hump Ridge Track. Rowallan Alton Incorporation provide accommodation to backcountry hunters and trampers/trekkers at its backpacker lodge located adjacent to the farm house and public car park. The management team for the Rarakau Forest Carbon Project includes the land manager (dwells on the property), the Project Owner and the Project Developer co-manager.

The risk assessment for Project Management Risk is presented in Table 8.2.1a below. Risk factors that are applicable are highlighted in green.

Table 8.2.1a. Project Management Risk

Risk Factor	Risk Factor and/or Mitigation Description	VCS Score[12]	Risk Rating
a)	Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar agro-ecological zone(s) in which the project is located. NOT APPLICABLE	2	0
b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued. NOT APPLICABLE	2	0
c)	Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (ie, any area of required experience is not covered by at least one individual with at least 5 years experience in the area). NOT APPLICABLE	2	0
d)	Management team does not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area. NOT APPLICABLE	2	0
e)	***Mitigation*****:** *Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting APPLICABLE*	-2	0[13]
f)	***Mitigation*****:** *Adaptive management plan in place. NOT APPLICABLE*	-2	0
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		**0**	**0**

[12] The VCS Score here refers to the VCS scores to be assigned should the particular condition apply.

[13] The score of -2 is not being recorded here because the Rarakau Forest Carbon Project is a new undertaking for all participants even though the Project Developer has personnel (Weaver) with considerable forest carbon management, policy and strategy experience.

Financial Viability Risk

Project development and initial transaction costs for the Rarakau Forest Carbon Project have been funded by a grant from Te Puni Kokiri – Ministry of Maori Development. The financial strategy for the Rarakau Forest Carbon Project is conservative and forms part of an intergenerational resource and asset management programme governed by the committee of the Rowallan Alton Incorporation, which also forms the Project Steering Committee for the Rarakau Forest Carbon Project. The financial goals of the Project Steering Committee (as stated and confirmed in numerous consultations with the Project Developer since 2007) are to use this project to provide a small revenue stream to assist in the enhancement of the conservation and associated cultural values of the Rowallan Alton Incorporation estate for the benefit of future generations of land owners and the wider community.

The combination of grant funding for project development and a conservative intergenerational and essentially public good benefit distribution approach by the Project Owner leaves the project outside a strictly commercial finance model and reduces or eliminates financial viability risk associated with break-even points and cash flows.

The risk assessment for Financial Viability Risk is presented in Table 8.2.1b below.

Table 8.2.1b. Financial Viability Risk

Risk Factor	Risk Factor and/or Mitigation Description	VCS Score	Risk Rating
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment. NOT APPLICABLE	3	0
b)	Project cash flow breakeven point is between 7 and up to 10 years from the current risk assessment. NOT APPLICABLE	2	0
c)	Project cash flow breakeven point between 4 and up to 7 years from the current risk assessment. NOT APPLICABLE	1	0
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment. NOT APPLICABLE	0	0
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven NOT APPLICABLE	3	0
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven. NOT APPLICABLE	2	0
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven. NOT APPLICABLE	1	0
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven. APPLICABLE	0	0
i)	***Mitigation***: *Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven NOT APPLICABLE*	-2	0
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.			**0**

Opportunity Cost Risk

Cost benefit analysis estimates indicate that net financial benefits from baseline activities would be between 20% to 50% more profitable than net financial returns from project activities (depending on carbon prices). While the Project Owner and the Projct Developer are both 'for-profit' entities (a Maori Incorporation and a limited liability company) the financial benefit strategy of the Rarakau Forest Carbon Project has the character of a not-for-profit initiative. This reduces opportunity cost risk for this project. The project is also protected by a legally binding commitment to protect the forest for the duration of the Project Period. The risk assessment for Opportunity Cost Risk is presented in Table 8.2.1c.

Table 8.2.1c. Opportunity Cost Risk

Risk Factor	Risk Factor and/or Mitigation Description	VCS Score	Risk Rating
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated. NOT APPLICABLE	8	0
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to 100% more than from project activities. NOT APPLICABLE	6	0
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities. APPLICABLE	4	4
d)	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated. NOT APPLICABLE	0	0
e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity. NOT APPLICABLE	-2	0
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity. NOT APPLICABLE	-4	0
g)	***Mitigation***: *Project proponent is a non-profit organization*[14]	-2	0
h)	***Mitigation***: *Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over the length of the project crediting period. APPLICABLE*	-2	-2
i)	***Mitigation***: *Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over at least 100 years NOT APPLICABLE*	-2	0
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g or h)] Total may not be less than 0.			**2**

[14] This mitigation factor wording comes from the VCS AFOLU Non-Permanence Risk tool. Carbon Partnership has elected to use the description of "not-for-profit organization" to most accurately reflect the stated intentions of the Rowallan Alton Incorporation with respect to the benefit distribution strategy of the Rarakau Forest Carbon Project.

Project Longevity Risk

There is a legal requirement for the Project Owner to continue the management practices for Rarakau Forest Carbon Project for the duration of the Project Period and any subsequent Project Periods.

The risk assessment for Project Longevity Risk is presented in Table 8.2.1d below.

Table 8.2.1d. Project Longevity Risk			
Risk Factor	Risk Factor and/or Mitigation Description	VCS Score	Risk Rating
a)	Without legal agreement or requirement to continue the management practice. NOT APPLICABLE	= 24 - (project longevity/5)	
b)	With legal agreement or requirement to continue the management practice. APPLICABLE	= 30 - (project longevity/2)	30 – 50/2 = 5
Total Project Longevity (PL) May not be less than zero			**5**

Table 8.2.1e. Internal Risk Total	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	**7**

8.2.2 External Risks

The Rarakau Forest Carbon Project External Risk Assessment was undertaken using the VCS AFOLU Non-Permanence Risk Tool, v3.0 (2011) for External Risk. The risk categories for external risk assessment are:

- External Risk 1: Land Ownership and Resource Access/Use Rights Risk
- External Risk 2: Community Engagement Risk
- External Risk 3: Political Risk

Land Ownership and Resource Access/Use Rights Risk

The forest lands in the Rarakau Forest Carbon Project are owned by the Maori beneficial owners represented by the Rowallan Alton Incorporation. The Rowallan Alton Incorporation also hold the resource access/use rights to the same area. The Project Area is protected by a legally binding commitment (Memorandum of Encumbrance). Both of these factors reduce the Land Ownership and Resource Access/Use Rights Risk.

The risk assessment for Land Ownership and Resource Access/Use Rights Risk is presented in Table 8.2.2a below.

Table 8.2.2a. Land Ownership and Resource Access/Use Rights Risk			
Risk Factor	Risk Factor and/or Mitigation Description	VCS Score	Risk Rating
a)	Ownership and resource access/use rights are held by same entity(s)	0	0
b)	Ownership and resource access/use rights are held by different entity(s) (e.g. land is government owned and the project proponent holds a lease or concession). NOT APPLICABLE	2	0
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership. NOT APPLICABLE	10	0
d)	There exist disputes over access/use rights (or overlapping rights). NOT APPLICABLE	5	0
e)	***Mitigation***: *Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period. APPLICABLE*	-2	-2
f)	***Mitigation***: *Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims. NOT APPLICABLE*	-2	0
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e+ f)] Total may not be less than zero.			**0**

Community Engagement Risk

The landowning community predominantly live outside the Project Area in various parts of New Zealand and in other countries. The Rowallan Alton Incorporation governs and manages the Project Area on behalf of all of the owners. The Rowallan Alton Incorporation employs a land manager that lives permanently on the property and the Rowallan Alton Incorporation Committee remains in regular contact with the land manager and regularly visits the land itself. Annual General Meetings of the Rowallan Alton Incorporation (and Rarakau Carbon Project Steering Committee) take place in the Project Area. The Rarakau Forest Carbon Project generates net positive impacts on the social and economic well-being of the Rowallan Alton Incorporation and beneficial landowners.

The risk assessment for Community Engagement Risk is presented in Table 8.2.2b below.

Table 8.2.2b. Community Engagement Risk

Risk Factor	Risk Factor and/or Mitigation Description	VCS Score	Risk Rating
a)	Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted. NOT APPLICABLE	10	0
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted. NOT APPLICABLE	5	0
c)	***Mitigation***: *The project generates net positive impacts on the social and economic well- being of the local communities who derive livelihoods from the project area PARTLY APPLICABLE*[15]	-5	0
Total Community Engagement (CE) [where applicable, (a+b+c)] Total may be less than zero.			**0**

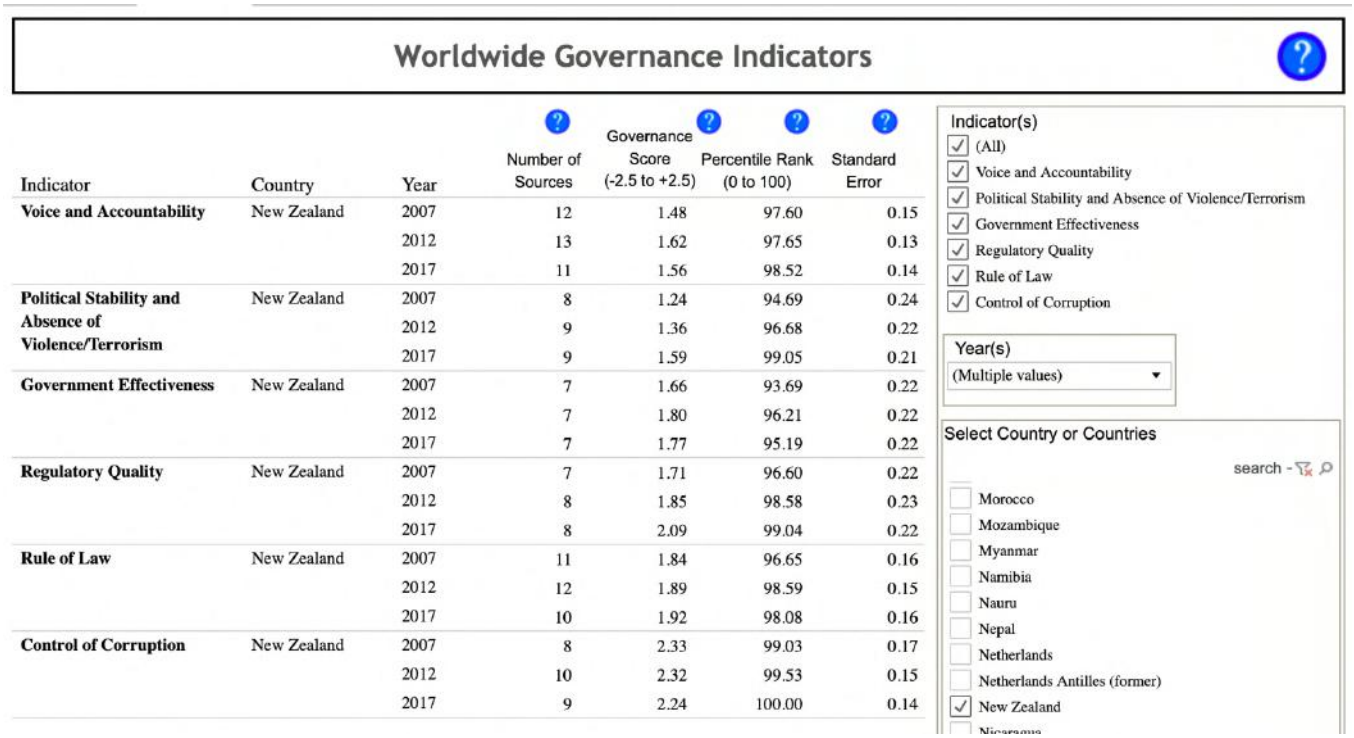
Political Risk

According to the VCS AFOLU Non-Permanence Risk Tool (2011) a governance score shall be calculated from the mean of Governance Scores across the six indicators of the World Bank Institute's Worldwide Governance Indicators (WGI)[16], averaged over the most recent five years of available data. Governance scores shall be translated into risk scores as set out in Table 8.2.2c below (using data derived from Figure 8.2.2).

[15] The project does generate net positive impacts on the social and economic well-being of the Project Owner community but this community does not derive their livelihood from the project area. The economic production taking place in the Project Area is being undertaken as a community project to add value to the general well-being of the Project Owner community by means of managing and developing a collectively held asset as a community project for the common good and primarily for the benefit of future generations.

[16] Available at: http://info.worldbank.org/governance/wgi/index.asp

Figure 8.2.2. New Zealand Governance Indicators Source: World Bank Worldwide Governance Indicators 2018[17].



Worldwide Governance Indicators

Indicator	Country	Year	Number of Sources	Governance Score (-2.5 to +2.5)	Percentile Rank (0 to 100)	Standard Error
Voice and Accountability	New Zealand	2007	12	1.48	97.60	0.15
		2012	13	1.62	97.65	0.13
		2017	11	1.56	98.52	0.14
Political Stability and Absence of Violence/Terrorism	New Zealand	2007	8	1.24	94.69	0.24
		2012	9	1.36	96.68	0.22
		2017	9	1.59	99.05	0.21
Government Effectiveness	New Zealand	2007	7	1.66	93.69	0.22
		2012	7	1.80	96.21	0.22
		2017	7	1.77	95.19	0.22
Regulatory Quality	New Zealand	2007	7	1.71	96.60	0.22
		2012	8	1.85	98.58	0.23
		2017	8	2.09	99.04	0.22
Rule of Law	New Zealand	2007	11	1.84	96.65	0.16
		2012	12	1.89	98.59	0.15
		2017	10	1.92	98.08	0.16
Control of Corruption	New Zealand	2007	8	2.33	99.03	0.17
		2012	10	2.32	99.53	0.15
		2017	9	2.24	100.00	0.14

[17] Available here: http://info.worldbank.org/governance/wgi/#reports

The overall mean Governance Score for New Zealand for 2006 to 2010 inclusive is 1.73. None of the Risk Factor and/or Mitigation Descriptions in Table 38 below apply to the Rarakau Forest Carbon Project.

Table 8.2.2c Political Risk			
Risk Factor	Risk Factor and/or Mitigation Description	VCS Score	Risk Rating
a)	Governance score of less than -0.79. (6) NOT APPLICABLE	6	0
b)	Governance score of -0.79 to less than -0.32. (4) NOT APPLICABLE	4	0
c)	Governance score of -0.32 to less than 0.19. (2) NOT APPLICABLE	2	0
d)	Governance score of 0.19 to less than 0.82. (1) NOT APPLICABLE	1	0
e)	Governance score of 0.82 or higher. (0) NOT APPLICABLE	0	0
f)	***Mitigation***: *Country is implementing REDD+ Readiness or other activities, as set out in this Section 2.3.3. NOT APPLICABLE*	-2	0
Total Political (PC) [as applicable ((a, b, c, d or e) + f)] Total may not be less than zero.			**0**

Table 8.2.2d External Risk Total	
Total External Risk (LT + CE + PC) Total may not be less than zero.	**0**

8.2.3 Natural Risks

The Rarakau Forest Carbon Project Natural Risk Assessment was undertaken using the VCS AFOLU Non-Permanence Risk Tool, v3.0 (2011) for Natural Risk as follows:

Fire Risk

Table 8.2.3a. Natural Risk 1: Fire	
Significance	**Minor** (5% to less than 25% loss of carbon stocks)
Likelihood	Every 10 to less than 25 years
Score (LS)	2
Mitigation	1 (neither: a) prevention measures applicable to the risk factor are implemented, nor b) Project Proponent has proven history of effectively containing natural risk)

Fire risk is a feature of the land management practices in this area where fire is used as a tool for clearing land for grazing on adjacent properties not controlled by the Project Owner, and until recently used as a means of eliminating stumps from forest recently historically cleared for pasture development. Fire as a land management tool has been eliminated from the land management practices on the farmland owned by the Project Owner. These farm lands are adjacent to the forests subject to the Rarakau Forest Carbon Project.

A fire event did occur in January 2011, which clipped the forest margin in part of the Eligible Forest Area and burned down the accommodation lodge adjacent to the public car park. The fire was caused by peat that had been smouldering for up to two years when fire was used as a management tool on these lands and prior to the initiation of the Rarakau Forest Carbon Project. This burn scar was removed from the Project Forest Area during project development in 2011.

The taller forests of this area are moist lowland rainforest and not susceptible to fire damage. The higher fire risk forest type in this region is regenerating manuka (*Leptospermum scoparium*) and gorse (*Ulex europeas*) scrub that is occasionally burnt on neighbouring lands by neighbouring landowners.

Pest and Disease Risk

Table 8.2.3b. Natural Risk 2: Pest and Disease	
Significance	**Insignificant** (less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event)
Likelihood	Every 50 to less than 100 years
Score (LS)	0
Mitigation	1 (neither: a) prevention measures applicable to the risk factor are implemented, nor b) Project Proponent has proven history of effectively containing natural risk)

Pest and disease risk to indigenous forests in the Rowallan Alton survey region is very low. Forest pests and diseases fall into the following categories:

- Insect pests
- Mammalian herbivores
- Weeds

Insect Pests

Insects can increase the damage caused by natural disturbance events including extreme weather. Wood-boring pinhole beetles (Platypus) are attracted to moist, dead wood in damaged forests. They carry the Sporothrix fungus, which kills trees and prompts a new cycle of pinhole beetle invasion. The platypus beetle routinely infects Nothofagus species, which is the dominant forest type in the Project Area. The impact of platypus beetle on Nothfagus forestry is primarily in reducing the recoverable timber volume from a sawlog due to beetle infestation. The forests of the Project Area have been affected by timber harvesting at various stages in the 20th century and as a consequence comprise stands of rigorous regeneration with low volumes of older senescent trees. The risk of combined damage from wind throw or snow break with Platypus infestation is low for these forests.

Mammalian Herbivores

According to Burrows et al (2008) there are three situations where mammalian herbivores may have a significant effect on the carbon stocks:

a. Alpine and subalpine grasslands[18]
b. Reverting shrublands (combined with grasslands)
c. Broadleaved hardwood forests with a high proportion of biomass in palatable tree and small-tree species.

Burrows (op cit) also note that:

- Limited quantitative data exists on actual or potential C stocks and C sequestration rates in indigenous vegetation communities.
- The direct consumption effect of mammalian herbivores is relatively small in comparison with total C stocks.
- Indirect effects of mammalian herbivores may be significant (e.g. nutrient cycling interactions with above and below ground systems).
- It may take many years after a control operation for consequent C stock change to be measurable as a distinct response to management intervention in the Project Scenario.
- Long-term effects of mammalian herbivores on forest succession may be significant – due primarily to their influence on vegetation composition (reduction of palatable species and potentially arresting successional sequences to tall forest species).

The likely short-term effects of implementing new mammalian herbivore control operations worth noting here are: modest increases in above ground live carbon stocks by new control of goats and deer resulting from:

- Succession from grassland to woody vegetation in productive (moist and fertile) sites (not applicable to this instrument which is a 'forest-remaining-as-forest' instrument)
- Enhanced carbon uptake in some woody shrub lands.

One of the challenges with animal control measures in forest carbon management is to demonstrate that such changes are permanent – not merely in the application of control measures in the Project Scenario that are different from the Reference Scenario, but the quantitative outcome of control measures in terms of carbon stock change on the ground.

On balance therefore, it can be surmised that the impact of mammalian herbivores on the forests in the Rarakau Forest Carbon Project is likely to be minimal in terms of measurable carbon stock change in the short to medium term (10-25 years). This suggests a low risk rating for mammalian herbivores for the Rarakau Forest Carbon Project.

Weeds

Weed plant species affecting the Project Area are primarily restricted to gorse (*Ulex europeas*) and broom (*Cystisus scoparius*). Both plants are legumes and colonisers. They spread quickly but tend to provide a valuable nursery crop for the regeneration of native tree species that over top these weedy legumes, which subsequently cannot tolerate shade. These weed

[18] For Kyoto Protocol purposes, carbon calculations are limited to woody vegetation.

species are unlikely to negatively affect carbon stocks or stock change in the Project Area, indeed may even be regarded as beneficial to the carbon balance.

Extreme Weather Risk

Table 8.2.3c. Natural Risk 3: Extreme Weather	
Significance	**Minor** (5% to less than 25% loss of carbon stocks)
Likelihood	Every 25 to less than 50 years
Score (LS)	1
Mitigation	1 (neither: a) prevention measures applicable to the risk factor are implemented, nor b) Project Proponent has proven history of effectively containing natural risk)

Most of the Southland region is characterised by cool coastal breezes, and absence of shelter from the unsettled weather that moves over the sea from the south and southwest. Hot north-westerly conditions in summer can occasionally bring high temperatures owing to the rain shadow effect of the Southern Alps during westerly air flows. Typical summer daytime maximum air temperatures range from 16°C to 23°C, occasionally rising above 30°C. Winters are cold with infrequent snowfall and frequent frost. Typical winter daytime maximum air temperatures range from 8°C to 12°C. Hours of bright sunshine average about 1600 hours annually and are often affected by low coastal cloud or by high cloud in foehn wind conditions. The prevailing wind in Southland is from the southwest.

Mean temperature in Southland is projected to rise by up to 2.5°C over the next 70-100 years as a result of climate change. The IPCC 4th Assessment Report signals that New Zealand can expect a more frequent westerly air flow with increased rainfall in western regions and diminished rainfall in some eastern regions. Southland could be up to 30% wetter with more varied rainfall patterns, and flooding could become up to four times as frequent by 2070.

Storm intensities are likely to rise during the course of the Project Period increasing the risk of cyclone events affecting coastal areas including those of the Rowallan Alton survey region.

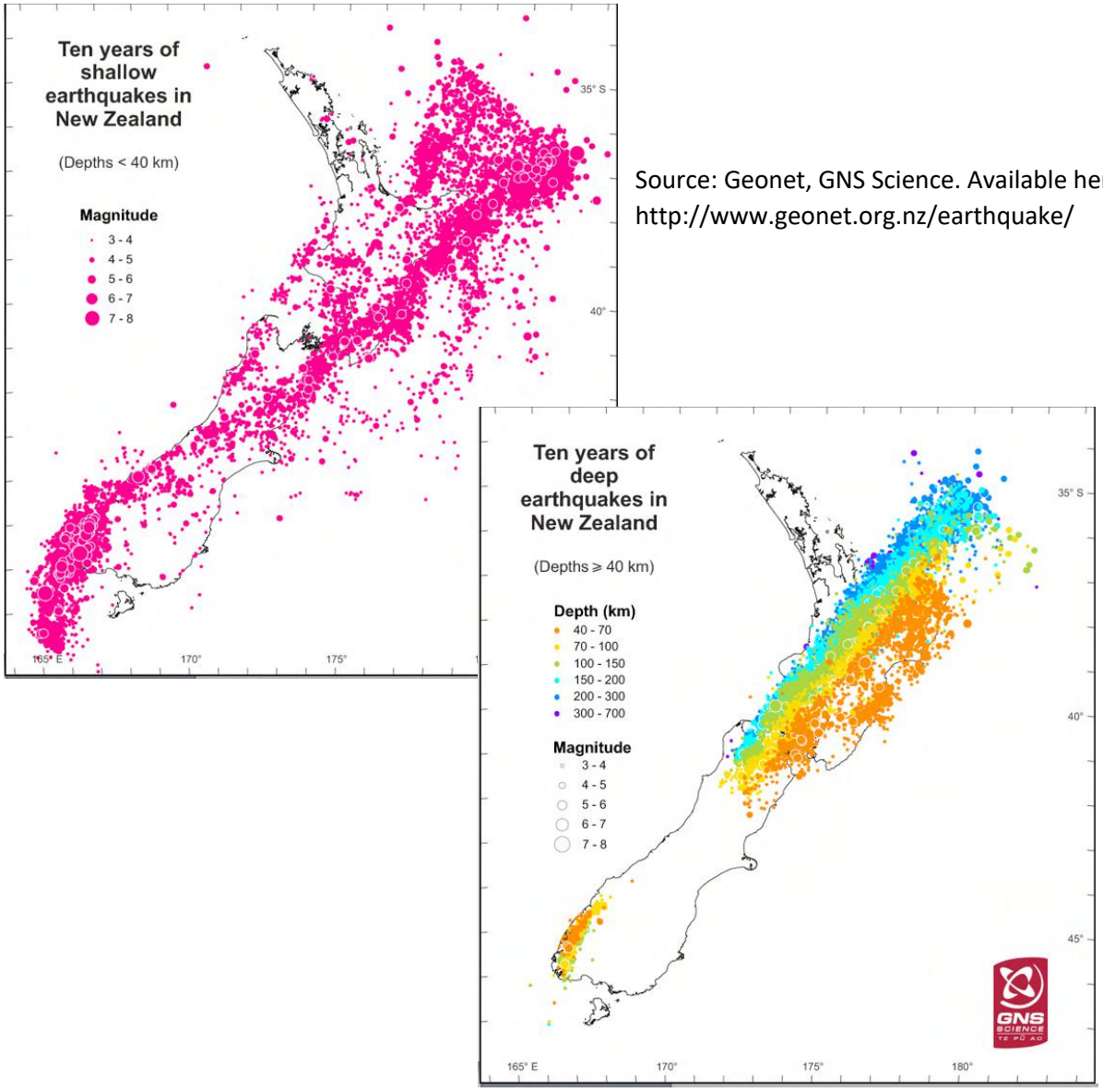
Geological Risk

Table 8.2.3d Natural Risk 4: Geological	
Significance	**Minor** (5% to less than 25% loss of carbon stocks)
Likelihood	Every 50 to less than 100 years
Score (LS)	1
Mitigation	1 (neither: a) prevention measures applicable to the risk factor are implemented, nor b) Project Proponent has proven history of effectively containing natural risk)

The predominant geological risk factor for the Rowallan Alton survey region is earthquake and landslide risk. These two risks are also related as earthquakes can trigger landslide events. In

the absence of locality specific data on landslides and earthquakes for this region it was considered appropriate to look at national data for earthquakes.

Figure 8.2.3. New Zealand Earthquakes



Source: Geonet, GNS Science. Available here: http://www.geonet.org.nz/earthquake/

MAGNITUDE	ANNUAL AVERAGE	MINIMUM	MAXIMUM	"IN GENERAL"
4.0 - 4.9	352.05	124	1,178	1 per day
5.0 - 5.9	27.26	6	109	2 per month
6.0 - 6.9	1.63	0	7	3 per 2 years
7.0 - 7.9	0.26	0	2	1 per 4 years
8.0 or over	0	0	0	1 per century*

Frequency of New Zealand Earthquakes (1960 to 2016)

As shown in Figure 8.2.3 western Southland and adjacent Fiordland features prominently in both shallow and deep earthquakes over a ten-year period.

In terms of longer time frames Fiordland features prominently in several larger historical earthquakes in New Zealand[19] as follows:

- M 7.8, Dusky Sound, July 15 2009 This earthquake in Fiordland was New Zealand's largest for nearly 80 years.
- M 6.7, George Sound, October 16 2007 Fiordland was shaken once again by a large earthquake centred off the coast of the South Island.
- M 7.2, Fiordland, August 22 2003 This severe earthquake generated over 200 landslides and several small-scale tsunami on the South Island's west coast.
- M 6.8, Secretary Island, August 10 1993 The 1993 Secretary Island earthquake was reportedly felt as far away as Sydney, Australia.
- M 6.7, Te Anau, June 4 1988 The earthquake that shook Te Anau in June 1988 triggered numerous landslides, and even cut the power to some southern towns.

For earthquake events to affect carbon stocks they would need to cause significant landslide events in the Project Area. No evidence of significant earthquake induced landslides exist for the region surrounding the Project Area. The risk assessment is therefore conservative.

Natural Risk Rating

Table 8.2.3e Score for each natural risk applicable to the project (Determined by (LS × M)	
Fire (F)	2
Pest and Disease Outbreaks (PD)	0
Extreme Weather (W)	1
Geological Risk (G)	1
Other natural risk (ON)	0
Total Natural Risk (as applicable, F + PD + W + G + ON)	**4**

8.3 BUFFER CREDITS

8.3.1 Buffer Account Attributes

The buffer account attributes for this project follow the attributes required by the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018 as follows:

[19] Sourced from Geonet. Available at: http://www.geonet.org.nz/earthquake/historic-earthquakes/

Table 8.3.1: Buffer Account Attributes	
Assignment	When credits are issued to a project, a portion of the net change in the project's carbon stocks are deposited as buffer credits into the AFOLU pooled buffer account.
	The volume of buffer credits is calculated based on a multiple of a project's non-permanence risk rating and the net change in the project's carbon stocks for the relevant period, with a minimum of 20% net carbon benefits assigned to the buffer.
Administration	The Programme Operator administers the pooled buffer account.
Title	Title to the buffer credits remains with the Programme Operator and does not pass to the Project Owner, unless the Programme Operator elects to do so.
Change to Risk Rating	Where a project's risk rating reduces at a subsequent verification, the volume of buffer credits to be held against that project is adjusted based on the new risk rating and total carbon stock changes for the project. Excess buffer credits must be released and issued as saleable credits.
	Where a project's risk rating increases at a subsequent verification, no release of buffer credits may occur.
Netting Off	The deposit and release of buffer credits will be netted off to provide a single transaction.
Cancellation	Where a verification report indicates a negative net change in GHG emissions, no credits may be issued to the project until a further verification report indicates the deficit is remedied. Where credits were previously issued to the project, buffer credits equivalent to the negative net change in GHG emissions must be cancelled from the buffer account.
	Buffer credits are cancelled for negative net changes in GHG emissions in unavoidable reversals only. This is consistent with the Climate Action Reserve forest carbon protocols.
	Where the reversal is avoidable, buffer credits are left untouched and the Project Owner is responsible for retiring carbon credits of a standard equivalent to saleable credits issued to the project and volume equivalent to the reversal.
Suspension	Where a project fails to submit a verification report within seven years of the last report, 50% of the buffer credits associated with the project will be put on hold. After a further three years, all remaining buffer credits will be put on hold. Where no subsequent verification report is presented, buffer credits equivalent to the total number of live credits issued to the project will be cancelled (including buffer credits put on hold).
	Where buffer credits are put on hold for failure to submit a verification report, the project may reclaim the buffer credits on submitting a new verification report.
Final Cancellation	The remaining balance of buffer credits associated with a project will be managed by the Programme Operator for the benefit of the Programme.

8.3.2 Buffer Calculation

8.3.2.1 Buffer Credits For Net Baseline Emissions Avoided (BUFNBEA)

Buffer Credits associated with Net Baseline Emissions Avoided (BUFNBEA) are calculated using the following equation:

Equation 8.3.2.1: $BUFNBEA = NBEA \times PRR$

Parameters	
BUFNBEA	Buffer Credits associated with Net Baseline Emissions Avoided ($tCO_2e\ yr^{-1}$)
NBEA	Net Baseline Emissions Avoided within EFA ($tCO_2e\ yr^{-1}$)
PRR	Project Risk Rating (dimensionless)

Therefore, BUFNBEA = 342 x 0.20 = 68 $tCO2e\ yr^{-1}$

8.3.2.2 Buffer Credits For Net Project Removals

Buffer Credits associated with Net Project Removals (NPR) for each rotation in the baseline timeline for the Project Scenario are calculated using the following equation:

Equation 8.3.2.2: $BUFNPR = NPR \times PRR$

Parameters	
BUFNPR	Buffer Credits associated with Net Project Removals ($tCO_2e\ yr^{-1}$)
NPR	Net Project Removals within EFA ($tCO_2e\ yr^{-1}$)
PRR	Project Risk Rating (dimensionless)

Therefore, BUFNPR = 2,730 x 0.20 = 546 $tCO2e\ yr^{-1}$

8.3.2.3 Total Buffer Credits

Total Buffer Credits (BUFTOT) is calculated as:

Equation 8.3.2.3: $BUFTOT = BUFNBEA + BUFNPR$

Parameters	
BUFTOT	Total Project Buffer Credits ($tCO_2e\ yr^{-1}$)
BUFNBEA	Buffer Net Baseline Emissions Avoided within OFA ($tCO_2e\ yr^{-1}$)
BUFNPR	Buffer Net Project Removals within OFA ($tCO_2e\ yr^{-1}$)

Therefore: BUFTOT = 68 + 300 = 614 $tCO_2e\ yr^{-1}$. See Appendix 6/Rarakau Carbon, cell D21.

8.4 NET CARBON CREDITS

8.4.1 Step 16 – Net Carbon Credits

Net Carbon Credits is calculated for the Rarakau Rainforest Carbon Project using equation 8.4.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

Net Carbon Credits (NCC) for the Rarakau Rainforest Carbon Project were calculated as:

Equation 8.4.1: $NCC = (NBEA - BUFNBEA) + (NPR - BUFNPR)$

Parameters

NCC	Net Carbon Credits ($tCO_2e\ yr^{-1}$)
NBEA	Net Baseline Emissions Avoided ($tCO_2e\ yr^{-1}$)
BUFNBEA	Buffer for NBEA ($tCO_2e\ yr^{-1}$)
NPR	Net Project Removals ($tCO_2e\ yr^{-1}$)
BUFNPR	Buffer for NPR ($tCO_2e\ yr^{-1}$)

Therefore: NCC = (342 – 68) + (2,730 – 546) = 2,458 $tCO_2e\ yr^{-1}$. See spreadsheet in Appendix 6/Rarakau Carbon, cell D22.

8.4.3 Grand Summary

Carbon Partnership asserts that the aggregate carbon benefits from the implementation of the Rarakau Rainforest Carbon Project arise from the following activities in the following volumes:

Table 8.4.3. Rarakau Rainforest Carbon Project GHG Assertion

Acronym	Activity	Description	tCO_2e
NBEA	Net Baseline Emissions Avoided	Avoided emissions from terminating and/or avoiding baseline timber harvesting, and allocated/issued for Year 1 only.	342
BUFNBEA	Buffer for Net Baseline Emissions Avoided	Buffer for avoided emissions from terminating and/or avoiding baseline timber harvesting, and allocated/issued for Year 1 only.	68
NPR	Net Project Removals	Removal enhancement from terminating activities that arrest natural succession of the forest, allocated/issued for Years 1-50.	2,730
BUFNPR	Buffer for Net Project Removals	Buffer for removal enhancement from terminating activities that arrest natural succession of the forest, allocated/issued for Years 1-50.	546
BUFTOT	Total Buffer	Buffer NBEA and NPR.	614
NCC	Net Carbon Credits	Total carbon benefits minus total buffer	2,458

Carbon Partnership asserts the following VER and Buffer credit issuance to the Rarakau Rainforest Carbon Project if implemented according to this PD and verified: 2,458 tCO2 annually.

8.5 MANAGING LOSS EVENTS

The Rarakau Rainforest Carbon Project will use the most recent version of the VCS 'AFOLU Guidance: Example for GHG Credit Accounting Following a Loss Event' for addressing loss events during the Project Period.

9. Ancillary Impacts

9.1 COMMUNITY BENEFITS

Community benefits in the Rarakau Rainforest Carbon Project follows the specific methodology elements contained in Section 9 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

9.1.1 Description of Project Owner Community

The Project Owner community for the Rarakau Rainforest Carbon Project is represented by the committee of the Rowallan Alton Incorporation (RAI), which is also the Project Steering Committee for the Rarakau Rainforest Carbon Project. The Project Steering Committee have a mandate to represent the landowners of the lands contained in the Project Area who, in their aggregate, comprise the descendants of the individual landless Maori who were granted these particular land blocks in 1906 as compensation for lands illegally alienated during the 19th century. This land compensation transfer was undertaken by the New Zealand Government though the enactment of the South Island Landless Natives Act (1906) (SILNA).

All landowners in the Rarakau Rainforest Carbon Project are indigenous peoples of Maori descent from a variety of tribal backgrounds. All of the landowners reside outside the Project Area. There are no land tenure disputes associated with the lands contained within the Project Boundary.

Rowallan Alton Incorporation

The Rowallan Alton Incorporation represents the descendants of 99 named members of the following families; BAIRD, FLUERTY, MANIHERE, PAHAU, PERE, ROPATA, SAUNDERS, TIKOU, and WELLS, who were granted land under “The South Island Landless Natives Act 1906” (SILNA). Each of these descendants comprise the shareholders of the “Rowallan Alton Incorporation” established in accordance with the Maori Affairs Act with a total land resource of 1,212 hectares. The full list of the original grantees is included in Appendix 7.

Due to the very dispersed nature of the actual beneficial owners - none of whom live at the project site - it is not possible to undertake an assessment of the social and economic status of the landowners. The membership of the Rowallan Alton Incorporation is not representative of the landowner group but has been mandated to manage this land on behalf of the beneficial owners. The purpose of this land management is to operate a self-sustaining communally-owned farm, and a self-sustaining communally-owned indigenous forest area. The goal of the beneficial owners is to have the land at Rarakau (both farm and forest) a place to come to for cultural gatherings, education, and conservation activities.

9.1.2 Description of Past and Current Land Use

The lands owned by the Project Owner were largely economically useless to the New Zealand government at the time (i.e. in 1906) and were subsequently economically useless to the new Maori owners, even though these Maori were ostensibly being fairly compensated for the illegal alienation of much more productive lands formerly in their possession. The compensation lands were largely of little economic value to the new owners at the time because they are located in remote, inaccessible country a long distance from roads, markets, or development infrastructures. As such many of these lands provided no economic benefit to the owners throughout much of the 20th century apart from selective logging in certain areas (including on some of the areas within the Project Area).

Among the most productive uses of some of these lands was to remove forest and create farmland – as per the original intention of the compensation grant. This was achieved in small part by some SILNA owners, including the Rowallan Alton Incorporation (RAI), who developed some dairy grazing lands within their estate, whilst retaining (and harvesting timber from) indigenous forest in the remainder.

In 1993 the New Zealand Government passed the Forest Amendment Act (1993) that banned the clear cutting of indigenous forest. SILNA owners challenged this law because it would have significantly reduced the economic value of the SILNA forest land assets because it would have prevented them from being transformed into productive farmland or productive plantation forestry land. SILNA owners subsequently won an exemption from this law that applies to all forest owners apart from SILNA. However, another piece of legislation – the Resource Management Act (1991) provides local government jurisdictions with the ability to control forest management activities and prevent clear cutting of indigenous forests on SILNA lands for conversion to either productive farmland or forestry plantation land. This led the SILNA owners to lodge a grievance claim with the Waitangi Tribunal seeking special treatment to enable them to realize the full productive value of their forest lands as promised them by the original SILNA Act of 1906. This claim is yet to be heard by the Waitangi Tribunal.

In the meantime, SILNA owners including the Rowallan Alton Incorporation have been seeking ways to derive economic benefits from their resource base. One potential opportunity arose with the Kyoto Protocol and the potential opportunity to generate carbon revenues by protecting their forest resource. But because these forest lands are covered by Article 3.4 of the Kyoto Protocol and because New Zealand government elected to not undertake this optional component of the Protocol, these SILNA owners missed out yet again from an opportunity to generate economic benefits from their land, this time when they sought to protect their forests instead of continuing to harvest timber in another harvest cycle.

This project arose from a lengthy history of collaboration between the Principal of Carbon Partnership Ltd and the Rowallan Alton Incorporation, who have collaborated since 1998 in an attempt to gain these forest owners a fair revenue stream from their forest resource. This project has been developed therefore, as a way to provide economic development benefits

without having to resort to extractive harvesting or seek recompense from the Government for loss of opportunity.

9.1.3 Project Consultation Protocol

The Rarakau Rainforest Carbon Project uses the Project Consultation Protocol provided in Section 9.1.3 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. Each consultation event will follow the meeting requirements set out in Table 9.1.3 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018 as follows:

Table 9.1.3a: Project Consultation Process

#	Meeting Title	Recurrence	Key Decision	Purpose
0	Project Scoping Meeting	Single	Mandate to proceed to Project Scoping Workshop	Meet and greet between Project Owner and the Project Developer to clarify the potential to undertake a project
1	Project Inception consultation	Single	Mandate to develop project	Formal meeting to determine project process and content
2	Project Description consultation	Single	Mandate to proceed to validation	Review and approval of PD
3	Project Implementation consultation	Single	Mandate to implement project	Review and approval of Project Implementation Plan
4	Project Management consultation	Annual	Mandate for ongoing project management	Review and approval of Project Management and Project Business Reports
5	Project Monitoring consultation	5 Yearly	Mandate to proceed to verification	Review and approval of Project Monitoring Reports

The Project Consultation Protocol used by the Rarakau Rainforest Carbon Project prior to validation provided for the completion of the equivalent of Meetings 0 to 3 inclusive, with meetings 4 and 5 required after the first verification. The following consultations were undertaken during the course of project development for the Rarakau Rainforest Carbon Project:

Table 9.1.3b Rarakau Rainforest Carbon Project Community Consultations			
Consultation Required	**Consultation Completed**	**Date**	**Comment**
Project Scoping Meeting	RAI Committee Meeting 2007	2007	Mandate to apply for Phase 1 funding
	TPK Project Report Back	25/07/2008	Report back Phase 1 results, Christchurch Office TPK
	RAI Committee Meeting	26/07/2008	Mandate to apply for Phase 2 funding
	RAI Committee & Membership Meeting	07/11/2009	Mandate to develop carbon project
Project Inception Workshop	TPK Project Report Back	18/06/2010	Project Reporting Christchurch Office TPK
	TPK Project Report Back	25/06/2010	Project Reporting Wellington Office TPK
	RAI Committee Meeting	25/06/2010	Mandate to apply for Phase 3 funding
	RAI Committee Meeting	30/05/2011	Mandate to proceed to implementation
Project Description Workshop A	RAI Committee Meeting	30/08/2011	Mandate to proceed to validation
Project Description Workshop B	RAI Committee Meeting and RAI Membership Meeting and AGM	05/11/2011	Mandate to proceed to validation and project update for landowner community
Project Description Workshop C	RAI Committee Meeting	14/12/2017	Mandate to proceed to validation to the Plan Vivo standard

In addition to face-to-face meetings, consultations also took the form of telephone conversations and emails between the Project Steering Committee and the Project Developer, together with the circulation of memos, and project documents. Evidence to support the assertion that the meetings specified in Table 9.1.3b took place can be found in Appendix 19. Evidence of the circulation of consultation memos and emails during the course of Project Development are available from the Project Developer on demand.

9.1.4 Project Dispute Resolution Framework

Each project in the Rarakau Programme is required to prepare a Project Dispute Resolution Framework to guide the process of dispute resolution should it occur during the course of the project. There is provision for dispute resolution in the Programme Agreement and the Project Agreement, but the Project Dispute Resolution Framework is designed to help avoid resorting to contractual or legal remedies.

Project Owners together with Project Developers are required to co-design the Dispute Resolution Framework based on principles of conflict resolution and non-violent communication.

Project Owners and Project Developers are required to incorporate the Project Dispute Resolution Framework into the Project Description Documentation (PD). Any revisions of the Project Dispute Resolution Framework will be incorporated into PD Revisions. Any dispute resolution events shall be recorded in Dispute Resolution Reports.

The Inception Project of the Rarakau Programme (the Rarakau Rainforest Carbon Project) is required to prepare the Project Dispute Resolution Framework for approval by the Project Steering Committee at the first Project Management Meeting following first verification.

9.1.5 CM2 Offsite Stakeholder Impacts

It is optional for projects in the Rarakau Programme to undertake the management and monitoring of offsite stakeholder impacts. Should projects decide to include offsite stakeholder impacts in project management and project monitoring, they can use the methodological guidance of the CCB standard or any other community impact or safeguards standard or guidance to do so.

Any offsite stakeholder management will be included in a revision of the Project Management Plan and incorporated into Project Management Reports and (where necessary) Project Monitoring Reports (e.g. if verification is sought).

9.1.6 CM3 Community Impact Monitoring

The Rarakau Rainforest Carbon Project will undertake community impact monitoring once the project becomes financially sustainable. Community impact monitoring will include low resolution baseline and project status of community impact KPIs directly and indirectly attributable to the project, with the option to include higher resolution measurement though time. During any period in which the project is not financially self-sustaining, community impact monitoring can involve a simplified community impact monitoring regime.

Community impact monitoring will include KPIs relating to inter-generational commitments to the project by the leadership of the landowning community, and associated project benefits across a 50-year timeframe.

9.2 BIODIVERSITY BENEFITS

9.2.1 Biodiversity Impact Monitoring

The Rarakau Rainforest Carbon Project will undertake biodiversity impact monitoring once the project has become financially self-sustaining. Biodiversity impact monitoring will include low resolution baseline and project status of biodiversity impact KPIs directly and indirectly attributable to the project, with the option to include higher resolution measurement though time. During any period in which the project is not financially self-sustaining, biodiversity impact monitoring can involve a simplified biodiversity impact monitoring regime.

9.2.2 Net Positive Biodiversity Impacts

The Rarakau Rainforest Carbon Project protects lowland and coastal indigenous forest adjacent to Fiordland National Park and in an area that has experienced a high degree of forest degradation and some deforestation in recent decades. The biodiversity value of this project is implied by means of the kind of forest conservation involved, with the actual biodiversity benefits documented during project development in the form of site descriptions provided in Section 2 of this PD, and descriptions available in the Sustainable Forest Management Plans used in the Baseline Scenario calculations.

Biodiversity conservation management will involve regular pest control. Biodiversity monitoring will involve biodiversity surveys. This project produces a relatively small volume of carbon credits annually: 2,458 tCO2e yr^{-1} over 738ha of crediting area and a larger area protected under this project). Maximum annual carbon credit cash flows (e.g. average carbon prices for this project of US$13/tCO2e - yielding a total of US$32,000 annually) are insufficient to finance detailed biodiversity surveys in addition to conservation opportunity costs (replacing foregone timber revenue), conservation management costs, measurement reporting and verification costs, transaction costs, and sales/marketing costs. For this reason, simplified biodiversity monitoring will be undertaken concurrently with project carbon monitoring. This will involve recording biodiversity encountered during project carbon monitoring and noting any conservation management issues arising (e.g. pest browsing).

Efforts will also be undertaken to access low-cost or grant funded biodiversity monitoring services (e.g. through attempts to partner with tertiary education providers).

Watershed management benefits are also of relevance to the project co-benefit portfolio. Such watershed benefits include the maintenance of high water quality in local streams compared with the reduction in water quality from sedimentation arising from logging and log removal activities under the baseline.

10. Managing Data Quality

10.1 DATA MANAGEMENT PROCEDURES

The data management system for the Rarakau Rainforest Carbon Project will follow Section 10.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. The data management system will involve the following data content elements:

- All project documents listed in Section 12.1 of this document
- Project Description Information Platform
- GHG Information Platform
- Ancillary Impacts Information Platform
- Project Administration Information Platform
- Project Management Information Platform
- Project Monitoring Information Platform

10.2 DATA STORAGE AND SECURITY

All project-specific data and documents will be stored electronically as followings:

- Project Developer: Three secure full data archives on data storage hardware
- Programme Operator: One secure full data archive held on data storage hardware
- One complete data archive held on data storage hardware owned by the Project Owner
- One partial data archive held by the Registry

The Standard Operating Procedure (SOP) for data storage and security for the Rarakau Rainforest Carbon Project is presented in the Rarakau Project Standard Operating Procedures D3.P1.17 v1.0 15 May 2012 (Appendix 23).

The Rarakau Programme also has an on-line data management system to streamline data management and data archiving.

10.3 DATA OUTPUTS AND REPORTING

Data outputs and reporting is covered in Sections 12 and 14 of this document. Data will be shared by publishing project documentation on the project website. This provides for transparency and availability of the data to the public.

10.4 ASSESSMENT OF UNCERTAINTY

The conservative estimates used in calculations in the baseline and project scenarios in the Rarakau Rainforest Carbon Project are based on verifiable literature sources and expert

judgement and follow the specific methodology elements in the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. Uncertainty is addressed in the Rarakau Rainforest Carbon Project by following the approach to uncertainty as defined in Sections 10.4.1 and 10.4.2 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

11. Monitoring The GHG Project

11.1 PURPOSE OF MONITORING

The purpose of monitoring the Rarakau Rainforest Carbon Project is to provide evidence demonstrate that project implementation adheres to the PD and methodology, to ensure that project benefits are delivered, and to make GHG assertions for verification.

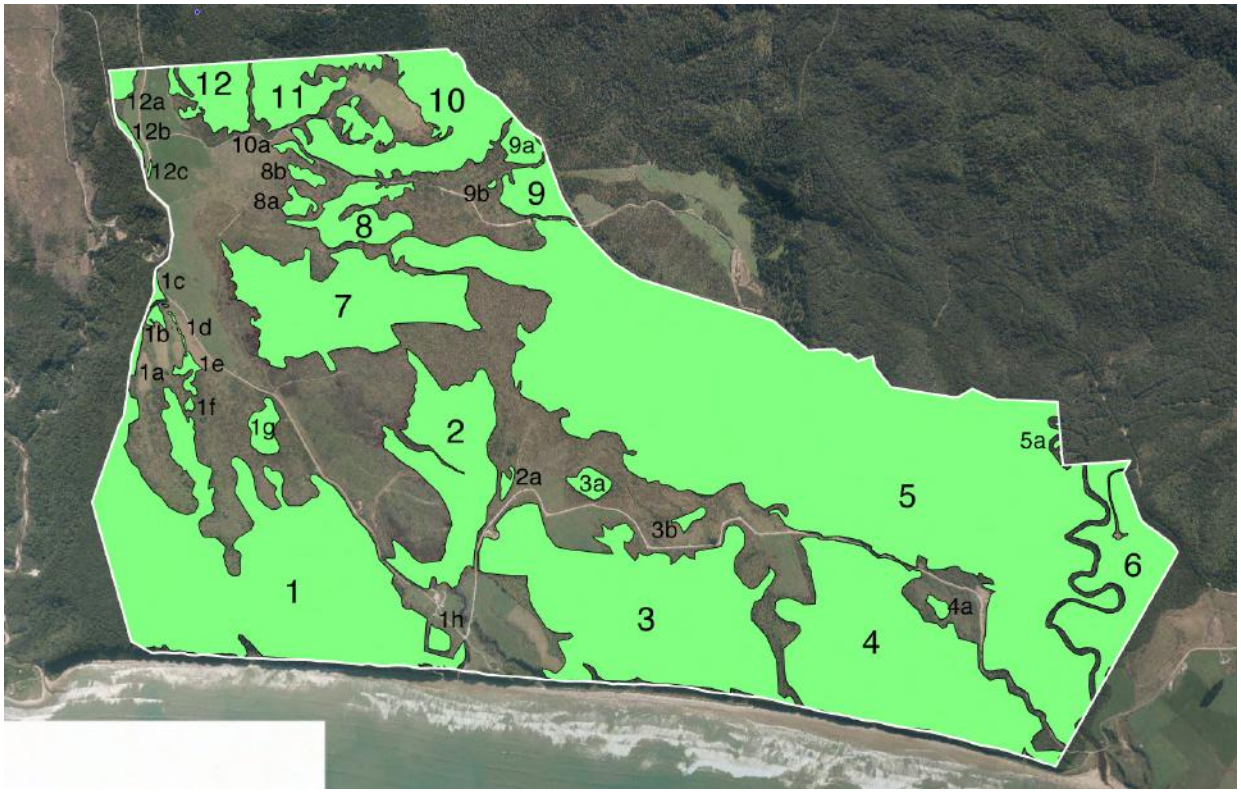
11.2 ELIGIBLE FOREST AREA INSPECTIONS

11.2.1 Forest Management Areas

Define and name forest management areas within Eligible Forest Area boundaries using the Eligible Forest Area map image. Identify each forest management area with a unique identifier (number). Forest management areas can be continuous with each other or may be discrete forest patches.

The Forest Management Areas for the Rarakau Rainforest Carbon Project are shown in Figure 11.2.1.

Figure 11.2.1 Rarakau Rainforest Carbon Project Forest Management Areas



11.2.2 Eligible Forest Boundary Inspections

Description: The Eligible Forest Area boundary is inspected annually to record the status of this boundary.

Purpose: Monitor and manage any reversals occurring at the boundary.

Method:

Make observations of the Eligible Forest Area boundary during the course of the Eligible Forest Area Inspections by means of site inspections.

Recurrence: Annual inspections.

11.3.3 Eligible Forest Area Inspections

Description: Descriptive survey of forest condition within Eligible Forest Area boundary.

Purpose: Monitor any reversals occurring within Eligible Forest Area and ensure that any timber harvesting lies within the *de minimis* limit imposed by the Rarakau Programme Methodology.

Method:

Review aerial imagery of the Eligible Forest Area and compare with previous aerial imagery data. Note any changes in the Eligible Forest Area (if any).

For each Reversal Event record the location with a GPS unit and describe the event using the Eligible Forest Area Inspection Checklist. For each timber harvesting Reversal Event record the stump diameter, the species of harvested tree where possible, any evidence of on-site timber processing, log hauling, and collateral damage.

Recurrence: Annual inspections.

11.3 REVERSAL RESPONSE PROCEDURE

Reversal events are subject to reversal clauses in the SOP D3.P1.17 v1.0, 2012, the Memorandum of Encumbrance, the Programme Agreement, the Buffer Account Attributes, and the Project Monitoring Plan, as follows:

11.3.1 SOP – Reversal Procedure

See the latest version of the SOP D3.P1.17 for details for each reversal risk event category.

11.3.2 Memorandum of Encumbrance – Reversal Procedure

The Memorandum of Encumbrance shall contain the following text:

> *The Encumbrancer agrees to notify the Encumbrancee as soon as reasonably practicable on becoming aware of:*
>
> *a. Any Reversal in the Project Area.*
> *b. Any breach of its obligations under this Encumbrance.*

11.3.3 Programme Agreement – Reversal Procedure

The Programme Agreement shall contain the following text:

You must notify the Programme Operator as soon as reasonably practicable on becoming aware of a Reversal. Your notification must include a written description and explanation of the Reversal.

Following a Reversal, we will determine whether the Reversal was Avoidable or Unavoidable.

Any Reversal will be accounted for in the monitoring report at the Project's next Verification Event.

If, on a Verification Event, the GHG Reduction Balance is lower than the GHG Reduction Balance at the last Verification Event, then:

> *If we determined that the Reversal was Unavoidable, we may Retire a quantity of Buffer Credits from the Pooled Buffer Account equivalent to the negative net change in the GHG Reduction Balance, capped at the number of Carbon Credits issued in respect of the Project, including Buffer Credits.*
>
> *If we determined that the Reversal was Avoidable, then you must:*
>
> *(a) Within 2 months of the Verification Event, deliver to us for Retirement, a quantity of Eligible Credits equivalent to the negative net change in the GHG Reduction Balance, capped at the number of Carbon Credits issued in respect of the Project, including Buffer Credits; and*
>
> *(b) Reimburse us on demand for all reasonable costs incurred by us in enforcing your commitments under this clause and the Encumbrance.*

Following a Reversal, you must take all action necessary to re-establish, restore or maintain, in accordance with the Project Implementation Plan, the project's GHG Reductions.

11.3.4 Reversal Definitions In Encumbrance And Programme Agreement

The Memorandum of Encumbrance and the Programme Agreement shall contain the following definitions relating to reversals:

> ***Reversal*** *means an event that materially reverses GHG Reductions in the Project Area.*
>
> ***Avoidable Reversal*** *means a Reversal arising from your negligence, your willful breach of the Programme Documents or from a third party properly exercising rights under an agreement or a legal interest in the Project Area.*
>
> ***Unavoidable Reversal*** *means a Reversal that is not an Avoidable Reversal.*

11.3.5 Reversals In Table 8.3.2: Buffer Account Attributes

Buffer Account Attributes in this methodology contains the following procedure relating to reversals:

> *Where a verification report indicates a negative net change in GHG emissions, no credits may be issued to the project until a further verification report indicates the deficit is remedied. Where credits were previously issued to the project, buffer credits equivalent to the negative net change in GHG emissions must be cancelled from the buffer account.*
>
> *Buffer credits are cancelled for negative net changes in GHG emissions in unavoidable reversals only. This is consistent with the Climate Action Reserve forest carbon protocols.*
>
> *Where the reversal is avoidable, buffer credits are left untouched and the Project Owner is responsible for retiring carbon credits of a specified standard and volume equivalent to the reversal.*

11.3.6 Reversals in the Monitoring Plan

See the details for the treatment of reversals in the following components of the Monitoring Plan:

- Eligible Forest Area
- Net Project Removals

11.4 DE MINIMIS TIMBER HARVEST INSPECTION

De minimis timber harvesting activity (if any) shall be recorded by the Project Owner and reported to the Programme Operator. The *de minimis* timber harvesting volume for the Rarakau Rainforest Carbon Project is 13.5m^3 per year. This amounts to <5% of the Total Wood Harvested in the Baseline Scenario, and in turn amounts to 0.032% of the Total Standing Volume of wood in the Eligible Forest Area.

11.5 ACTIVITY SHIFTING LEAKAGE INSPECTION

Activity Shifting Leakage Inspections will be undertaken annually in the Rarakau Rainforest Carbon Project following first verification as specified in Section 11.3, and 11.3.9 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. A statement on Activity Shifting Leakage will be included in Project Management Reports and Project Monitoring Reports.

11.6 PROJECT MANAGEMENT REPORTS

The Rarakau Rainforest Carbon Project will prepare annual Project Management Reports pursuant to Section 11.3 and 11.3.9 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

11.6.1 Simplified Project Management Report Methodology

The Rarakau Rainforest Carbon Project will prepare a Simplified Project Management Report for its first and second 3rd party verification, covering the Project Management Years 2009-2017 inclusive. Thereafter Project Owners will prepare a Project Management Report for subsequent verifications.

The Simplified Project Management Report will contain the following information:

- Map of the Eligible Forest Area
- Map of the Project Management Areas
- Statement by the Project Owner and Project Developer that
    - Describes the Project Activities that have been undertaken between the Project Start Date and the end of the first Monitoring Period.
    - Records of any *de minimis* timber harvesting that has occurred since the Project Start Date
    - Statement on Activity Shifting Leakage
    - Notes any issues relating to the risk of reversals
- Director's Certificate.

11.6.2 Project Management Review

The Programme Operator will undertake a Project Management Review at 5-yearly intervals, timed to mark the approximate halfway point between each 5-yearly Project Monitoring Period. The Project Management Review will involve a site inspection to verify the Project Management Reports submitted to the Programme Operator since the last verification

11.6.3 Standard Operating Procedure: Project Management

The Standard Operating Procedure (SOP) for Project Management for the Rarakau Rainforest Carbon Project is presented in the Rarakau Project Standard Operating Procedures D3.P1.17 v1.0 15 May 2012 (Appendix 23).

11.7 PROJECT MONITORING PLAN

Project Monitoring Report will be produced in the year following the final year of the Project Management Period.

The Rarakau Rainforest Carbon Project will produce a Simplified Project Monitoring Report for its first two verifications, covering the years between the Project Start Date and the end of the second Monitoring Period (1 January 2009 to 31 December 2017). This is pursuant to Section 11.4 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. The Simplified Project Monitoring Report will follow the method specified in Section 11.4.6 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

The data to be included in the Project Monitoring Reports include the data required at Validation and the Monitored Parameters (Sections 11.4.2 and 11.4.3 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018).

11.7.1 Monitored And Non-Monitored Parameters

The Monitoring Reports for the Rarakau Rainforest Carbon Project will include both monitored and non-monitored parameters as specified in Section 11.7.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

The monitored parameters to be included in the Project Monitoring Reports in the Rarakau Rainforest Carbon Project are summarised in Table 11.7.1 below and using monitoring methods described in Section 11.4.1 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018).

Table 11.7.1 Monitored and Non-Monitored Parameters (monitored parameters in green)

Notation	Parameter	Unit	Equa-tion	Origin	Monitored
EFA (OFA)	Eligible Forest Area (Operational Forest Area)	ha	-	PD	Monitored
LF/ULF	Forest stratification (logged/unlogged forest)	ha	-	PD	Area calculated in PD
TSV	Total Standing Volume	m^3	-	Forest Management Plan/PD	Calculated in PD
HR	The Harvest Rate	$m^3\ yr^{-1}$	7.1.1a 7.1.1b	Forest Management Plan/PD	Monitored Updated each Baseline Revision
TWH	Total Wood Harvested	$m^3\ yr^{-1}$	7.1.2a 7.1.2b	Forest Management Plan	Not monitored Updated each Baseline Revision
CD	Collateral Damage	$m^3\ yr^{-1}$	7.1.3	Default value derived from a proportion of the TWH	Not monitored Updated each Baseline Revision
AGBE	Above Ground Biomass Emitted	$m^3\ yr^{-1}$	7.1.4	Sum of TWH and CD	Not monitored Updated each Baseline Revision

BGBE	Below Ground Biomass Emitted	$m^3\ yr^{-1}$	7.1.5	Root-shoot ratio (proportion of AGBE)	Not monitored Updated each Baseline Revision
TM3	Total Emissions in m^3	$m^3\ yr^{-1}$	7.1.6	Sum of AGBE and BGBE	Not monitored Updated each Baseline Revision
TCO2	Total Emissions in tCO^2e	$tCO_2e\ yr^{-1}$	7.1.7a 7.1.7b 7.1.7c 7.1.7d	Conversion factors from wood volume to emissions	Not monitored Updated each Baseline Revision
NBE	Net Baseline Emissions	$tCO_2e\ yr^{-1}$	7.1.8	TCO2 ÷ 2	Not monitored Updated each Baseline Revision
ER	Enhanced Removals	$tCO_2e\ yr^{-1}$	7.2.1	Default values derived from mean sequestration rates for NZ forest types and subsequently derived from project-specific data	Not Monitored Updated each Monitoring Period
NPE	Net Project Emissions	$tCO_2e\ yr^{-1}$	7.2.1	Equal to ER	Not Monitored Updated each Monitoring Period
TAL	Total Activity Shifting Leakage	$tCO_2e\ yr^{-1}$	7.3.1	Derived from Activity Shifting Leakage Analysis	Monitored Updated each Monitoring Period
TML	Total Market Leakage	$tCO_2e\ yr^{-1}$	7.3.2	Derived from Market Leakage Analysis	Not monitored Updated each Baseline Revision

11.7.2 Monitored Parameters

Monitored parameters for the Rarakau Rainforest Carbon Project are as follows:

Table 11.7.2 Monitored Parameters

Notation	Parameter	Unit	Equa-tion	Origin	Monitored
EFA (OFA)	Eligible Forest Area (Operational Forest Area)	ha	-	PD	Monitored
HR	Harvest Rate	$m^3\ yr^{-1}$	7.1.1	Derived from Forest Management Plan	Monitored Updated each Monitoring Period
TAL	Total Activity Shifting Leakage	$tCO_2e\ yr^{-1}$	7.3.1	Derived from Activity Shifting Leakage Analysis	Monitored Updated each Monitoring Period

11.7.3 Monitoring Roles And Responsibilities

The Rarakau Rainforest Carbon Project will be managed and monitored by the Project Owner and the Project Developer according to the Project Agreement between these two parties. The role of the Project Developer is Project Co-Manager in collaboration with the Project Owner. The proportion of the co-management role played by the Project Developer will diminish through time as the Project Owner builds capacity and capability to undertake and coordinate project management and project monitoring without external assistance. The role of the Project Developer may eventually diminish to zero once the Project Owner is able to take responsibility for all project management and monitoring tasks.

Specific project monitoring roles in this project follow those specified in Table 11.7.3 below.

Table 11.7.3 Project Monitoring Roles & Responsibilities

	Responsibilities	
Task	Project Owner	Project Developer
Project Management		
Project management activities	Implement project management activities	Advice to Project Owner
Eligible Forest Area Boundary Inspections	Undertake Boundary Inspections jointly with Project Developer	Undertake Boundary Inspections jointly with Project Owner (initially)
	Increase role through time to undertaking Boundary Inspections with supervision/advice from Project Developer	Reduce role through time to supervision and advice
Eligible Forest Area Inspections	Undertake Area Inspections jointly with Project Developer	Undertake Area Inspections jointly with Project Owner (initially)
	Undertake Area Inspections with supervision/advice from Project Developer	Reduce role through time to supervision and advice
Project Management Report drafting	Providing information for Project Management Report	Drafting Project Management Report
	Increase role through time to drafting with supervision/advice from Project Developer	Reducing role through time to supervision and advice if needed
Project Monitoring		
Aerial imagery/mapping	Learn procedure for gaining aerial imagery and mapping from sub-contractor	Coordinate & manage aerial imagery sub-contracting on behalf of the Project Owner
	Increase role through time to coordinating with supervision/advice from Project Developer	Reduce role through time to supervision and advice

Project Monitoring data management	Learn procedure for Project Monitoring data management	Coordinate & manage Project Monitoring data management
	Increase role through time to data management with supervision/advice from Project Developer	Reduce role through time to supervision and advice

11.7.4 GHG Information Management Systems

The monitoring of the Rarakau Rainforest Carbon Project will use the GHG information management system described in Section 10.1 through 10.3 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

11.7.5 Simplified Project Monitoring Report Methodology

The Simplified Project Monitoring Report prepared for the Rarakau Rainforest Carbon Project for its first two verifications will follow the specifications of section 11.4.6 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018 and will cover the period of 1 January 2009 to 31 December 2011. The Simplified Project Monitoring Report will incorporate the requirements of the Simplified Project Management Report (see Section 11.3.9 of this PD), also required for first verification.

11.7.6 Standard Operating Procedure: Project Monitoring

The Standard Operating Procedure (SOP) for Project Monitoring for the Rarakau Rainforest Carbon Project is presented in the Rarakau Project Standard Operating Procedures D3.P1.17 v1.0 15 May 2012 (Appendix 23). The simplified SOP for Project Monitoring required for the Inception Project is consistent with the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018, and is presented in Appendix 3 of the first two Monitoring Reports.

11.7.7 Direct Measurement Of Forest Carbon Stock Change

The Rarakau Rainforest Carbon Project will initiate permanent sample plot measurement following first two verifications.

12. Documenting The GHG Project

12.1 RARAKAU PROJECT DOCUMENTS

The documentation for the Rarakau Rainforest Carbon Project follows the document naming protocol provided in the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018, as depicted in Table 12.1 below.

Table 12.1: Rarakau Project Documents

Document Name	Document Number
Project Documents	
Rarakau Rainforest Carbon Project: Project Description Documentation/PD	D3.P1.1 v1.0, date
Rarakau Rainforest Carbon Project: Project Idea Note/PIN	D3.P1.2 v1.0, date
Rarakau Rainforest Carbon Project: Summary	D3.P1.3 v1.0, date
Rarakau Rainforest Carbon Project: Scoping Workshop Report	D3.P1.4 v1.0, date
Rarakau Rainforest Carbon Project: Inception Workshop Report	D3.P1.5 v1.0, date
Rarakau Rainforest Carbon Project: Overview Report	D3.P1.6 v1.0, date
Rarakau Rainforest Carbon Project: Description Workshop Report	D3.P1.7 v1.0, date
Rarakau Rainforest Carbon Project: Implementation Plan	D3.P1.8 v1.0, date
Rarakau Rainforest Carbon Project: Implementation Workshop Report	D3.P1.9 v1.0, date
Rarakau Rainforest Carbon Project: Management Reports	D3.P1.10 v1.0, date
Rarakau Rainforest Carbon Project: Management Workshop Reports	D3.P1.11 v1.0, date
Rarakau Rainforest Carbon Project: Business Reports	D3.P1.12 v1.0, date
Rarakau Rainforest Carbon Project: Monitoring Report/s	D3.P1.13 v1.0, date
Rarakau Rainforest Carbon Project: Monitoring Workshop Reports	D3.P1.14 v1.0, date
Rarakau Rainforest Carbon Project: Dispute Resolution Framework	D3.P1.15 v1.0, date
Rarakau Rainforest Carbon Project: Dispute Resolution Reports	D3.P1.16 v1.0, date
Rarakau Rainforest Carbon Project: Standard Operating Procedures	D3.P1.17 v1.0, date
Rarakau Rainforest Carbon Project: Steering Committee Minutes	D3.P1.18 v1.0, date
Rarakau Rainforest Carbon Project: Termination Report	D3.P1.19 v1.0, date
Validation/Verification Documents	
Rarakau Rainforest Carbon Project: Validation Service Agreement/s	D4.P1.1 v1.0, date
Rarakau Rainforest Carbon Project: Validation Report/s	D4.P1.2 v1.0, date
Rarakau Rainforest Carbon Project: Validation Statement/s	D4.P1.3 v1.0, date
Rarakau Rainforest Carbon Project: Verification Service Agreement/s	D4.P1.1 v1.0, date
Rarakau Rainforest Carbon Project: Verification Reports	D4.P1.2 v1.0, date
Rarakau Rainforest Carbon Project: Verification Statements	D4.P1.3 v1.0, date

12.2 DOCUMENT DATABASE

This methodology requires the Project Developer to store all Project Documents securely in electronic and in hard copy formats. The electronic document database for the Rarakau Programme is described in Section 10 of this document.

13. Validation And/Or Verification Of The GHG Project

The Rarakau Rainforest Carbon Project PD is validated to the Plan Vivo carbon standard. The validator is Misheck Kapambwe, which is an approved Validator of the Plan Vivo Standard.

The Rarakau Rainforest Carbon Project Monitoring Reports will be verified to the Plan Vivo carbon standard, by a verifier approved by the Plan Vivo Standard. The first verification is undertaken by Misheck Kapambwe - an approved Verifier of the Plan Vivo Standard.

Carbon Partnership asserts that the Rarakau Rainforest Carbon Project shall over the Project Period:

- Allocate 614 Reserve Credits annually as a buffer for the project period.
- Allocate 2,458 VERs to the project annually for the project period.

14. Reporting The GHG Project

Reporting for the Rarakau Rainforest Carbon Project will follow the project documentation and reporting protocol presented in Sections 12 and 13 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018. Upon validation the PD will become available to the relevant project stakeholders and clients.

15. Adding Subsequent Projects To The Grouped Project

The Rarakau Rainforest Carbon Project is the Inception Project for the Grouped Project called the Rarakau Programme. The details on how subsequent projects will be added to the Grouped Project are contained in Section 15 of the Rarakau Programme Methodology D2.1 v2.0, 15 May 2018.

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Appendices

APPENDIX 1: LEGAL SANCTION FOR BASELINE ACTIVITIES

Ministry of Agriculture and Forestry information on sustainable forest management plans: http://www.maf.govt.nz/forestry/forestry-in-nz/indigenous-forestry.aspx

APPENDIX 2. SOUTHLAND DISTRICT COUNCIL RULE HER 3

Supplied in a separate document in Appendix Folder.

Document file name: PD Appendix 2 Southland District Council Rule HER 3.

Document title on title page: Southland District Plan (in footnote text).

APPENDIX 3: PROJECT AREA BASELIINE TIMBER HARVEST RATES

Document supplied separately in Appendix Folder.

Document file name: PD Appendix 3 RAI Timber Harvest Rates.

Document title on title page: Revised Desk Top Assessment of SILNA Rowallan/Alton Sections For Carbon Partnership Ltd

APPENDIX 4: SUSTAINABLE FOREST MANAGEMENT PLANS

Sustainable Forest Management Plans covering Reference Area land parcels (available under non-disclosure agreement conditions from Carbon Partnership Ltd on request):

SFM Plan - Section 1 Block III Rowallan Survey District

SFM Plan - Section 1 Block IV Rowallan Survey District

SFM Plan - Section 2 Block IV Rowallan Survey District

SFM Plan - Section 3 Block IV Rowallan Survey District

SFM Plan - Section 3 Block VII Alton Survey District

SFM Plan - Section 4 Block IV Rowallan Survey District

SFM Plan - Section 9 Block III Rowallan Survey District

SFM Plan - Section 9 Block IV Rowallan Survey District

SFM Plan - Section 12 Block IV Rowallan Survey District

SFM Plan - Section 15 Block IV Rowallan Survey District

APPENDIX 5: PROGRAMME AGREEMENTS

The agreements that lie at the legal core of this Grouped Project are:

- Memorandum of Encumbrance between the Project Owner and the Programme Operator (Appendix 16)
- Programme Agreement between the Project Owner and the Programme Operator (Appendix 17)
- Project Agreement between the Project Owner and the Project Developer (service agreement)
- Validation/Verification agreement between the Validator and the Project Developer
- Registry Agreement between the Programme Operator and the Registry

APPENDIX 6: RARAKAU RAINFOREST CARBON PROJECT CARBON ACCOUNTING SPREADSHEET

Spreadsheet supplied separately in Appendix Folder.

Document file name: Appendix 6 Project GHG Accounting

Document title on title page: Rarakau Rainforest Carbon Project GHG Information Platform Summary

APPENDIX 7: PROJECT OWNER STATUS

Document supplied separately in Appendix Folder demonstrating that the Rowallan Alton Incorporation was formed by means of aggregating several different land titles and amalgamating into a single title.

Document file name: Appendix 7 RAI Section Owners

Document title on title page: Cancelling Several Titles and Substituting One Title

APPENDIX 8: ROWALLAN ALTON INCORPORATION CONSTITUTION

Document supplied separately in Appendix Folder.

Document file name: Appendix 7 RAI Constitution

Document title on title page: The Constitution of the Rowallan Alton Incorporation

APPENDIX 9: BURROWS ET AL 1992

Document supplied separately in Appendix Folder.

Document file name: Appendix 9 Burrows 1992.

Document title on title page: The Standing Wood Volumes Of The Landless Native Grant Lands Of Southland And Stewart Island

APPENDIX 10: MAF 2000

Document supplied separately in Appendix Folder.

Document file name: Appendix 10 MAF 2000.

Document title on title page: Assessment of SILNA Timber Resources, 1999.

APPENDIX 11: SOUTHLAND DISTRICT COUNCIL DECISION

Document supplied separately in Appendix Folder.

Document file name: Appendix 11 SDC Orbell Decision 1999

Document title on title page: Report to the Planning Committee Confidential

APPENDIX 12: MAF CORRESPONDENCE ADDITIONALITY

Document supplied separately in Appendix Folder.

Document file name: Appendix 12 MAF Correspondence Additionality

Document title on title page: Email header “Questions of common practice for indigenous SFM”.

APPENDIX 13 SEQUESTRATION RATES

Spreadsheet supplied separately in Appendix Folder.

Document file name: Appendix 13 Carbon Sequestration Rates

APPENDIX 14: DEFINITIONS

A/R	Afforestation/Reforestation
Activity Type	Specifically defined carbon project activity combining a reference activity and a project activity to generate carbon benefits
AFOLU	Agriculture, Forestry and Other Land Uses
BAU	Business-as-Usual
Carbon balance	Sum of carbon in a system into account carbon stored in reservoirs, emissions of carbon from sources, and sequestration of carbon into sinks
Carbon benefits	Net CO_2e benefits arising from total net avoided emissions and net enhanced removals
Carbon flux	Movement of carbon through different carbon pools
Carbon pool	Component of the earth system that stores carbon
Carbon reservoir	Carbon pool that stores carbon for long time scales
Carbon sink	Carbon pool that absorbs/sequesters carbon dioxide by transforming gaseous CO_2 into a carbon-based liquid or solid
Carbon source	Carbon pool that emits carbon from a liquid or solid form into a gas
CDM	Clean Development Mechanism
CO_2e	Carbon dioxide equivalent: translation of non-CO_2 GHG tonnes into equivalent CO_2tonnes through conversion using global warming potential of non-CO_2 GHG
Compliance Space	What is contained within the GHG accounting boundary of a compliance GHG accounting regime (e.g. Kyoto Protocol, NZ ETS)
COP	Conference of Parties (to the UNFCCC)
CSR	Corporate Social Responsibility
Degradation	Reduction of carbon stocks in a forest system (that remains a forest system) arising from human management activities
DOE	Designated Operational Entity

Eligible Area	Subset of Forest Area comprising area of forest eligible for crediting
Enhanced removals	Carbon sequestration assisted by management intervention to a level above what would occur naturally
Ex ante	Before the event (referring to future activities)
Ex post	After the fact (referring to past activities)
FAA	Forest Amendment Act (1993)
Forest Area	Subset of Project Area comprising 'Pre-1990 Forest Land'
Forest Land	An area of land of at least one hectare with forest species that has, or is likely to have: o A crown cover of more than 30 percent on each hectare; and o An average crown-cover width of at least 30 meters.
GHG	Greenhouse Gas
GIS	Geographical Information System
GPG	Good Practice Guidance
HWP	Harvested Wood Products
IFM	Improved Forest Management
IFM-LtPF	Improved forest management – logged to protected forest activity type
IFM-LCtHC	Improved forest management – low carbon to high carbon forest activity type
IFM-LCtSFM	Improved forest management – low carbon to sustainable forest management logging activity type
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standards Organisation
KPCP1	Kyoto Protocol First Commitment Period (2008-2012)
LULUCF	Land Use, Land Use Change and Forestry
MAF	Ministry of Agriculture and Forestry

Marrakesh Accords	UNFCCC global agreement reached in 2001 setting the rules for the Kyoto Protocol
MRV	Measurement/Monitoring Reporting and Verification
NZ ETS	New Zealand Emissions Trading Scheme
Operational Forest Area	Term used in sustainable forest management plans delimiting area eligible for timber harvesting
PD	Project Documentation
PES	Payment for Ecosystem Services
PFSI	Permanent Forest Sink Initiative
Post-2012	Refers to the international UNFCCC carbon accounting period following the first commitment period of the Kyoto Protocol
Project Area	Land ownership boundary within which carbon project will take place
Project Developer	The entity assisting the Project Owner to develop and implement the forest carbon project.
Programme Operator	The entity that owns and administers the Rarakau Programme. This entity is Ekos – a charitable trust whose mission is to safeguard the integrity of the Rarakau Programme and role is to a) govern the Rarakau Programme; b) own the IP associated with Rarakau Programme methodologies and protocols; c) be the beneficiary of the covenant on the land title of the Project Owner that protects the forest; d) own the buffer credits of the Rarakau Programme; e) administer the buffer account with the registry; and f) act as the guardian of the Rarakau Programme.
Project Owner	The owner of the forest and forest carbon rights subject to the project
Project Proponent	The Project Owner and Project Developer combined.
Project Scenario	Carbon balance arising from Project (carbon project change from BAU as usual) activities
Protected Forest	Halting or avoiding activities that would reduce carbon stocks and managing a forest to maintain high and/or increasing carbon stocks
RED	Reducing emissions from deforestation

RED-DtSFM	Reducing Emissions from Deforestation – deforestation to sustainable forest management activity type
RED-DtPF	Reducing Emissions from Deforestation – deforestation to protected forest activity type
REDD	Reducing Emissions from Deforestation and Degradation
Reference Scenario	Carbon balance arising from reference (BAU) activities
REL	Reference Emission Level: rate of GHG emissions under BAU
Removals	Carbon sequestered from the atmosphere into a carbon sink
SFM	Sustainable Forest Management
UNFCCC	United Nations Framework Convention on Climate Change
Validation	Independent audit of Project Description Documentation (PD) and/or Methodology
VCS	Voluntary Carbon Standard
Verification	Independent audit of Project Monitoring Reports
Voluntary Space	Outside the GHG accounting boundary of the Compliance Space. See 'Compliance Space'

APPENDIX 15: EIA CONFIRMATION

Document supplied separately in Appendix Folder.

Document file name: PD Appendix 15 EIA Confirmation MFE

Document title on title page: Appendix 15: Evidence of no EIA requirement

APPENDIX 16: MEMORANDUM OF ENCUMBRANCE

Document supplied separately in Appendix Folder.

Document file name: PD Appendix 16 Encumbrance v0.2

Document title on title page: Memorandum of encumbrance

APPENDIX 17: PROGRAMME AGREEMENT

Document supplied separately in Appendix Folder.

Document file name: PD Appendix 17 Programme Agreement v0.4

Document title on title page: Programme Agreement

APPENDIX 18: GEOGRAPHIC COORDINATES

Shape files supplied separately in Appendix Folder.

Folder name: PD Appendix 18 Geographic Coordinates

Document title on title page: 12 files

APPENDIX 19: EVIDENCE OF CONSULTATIONS

Documents supplied separately in Appendix Folder.

Folder name: PD Appendix 19 Evidence of Consultations

Document title on title page: 4 documents

APPENDIX 20: ELIGIBLE FOREST BOUNDARY INSPECTION TEMPLATE

Document supplied separately in Appendix Folder.

Document file name: PD Appendix 20 Eligible Forest Boundary Inspection Template

Document title on title page: Eligible Forest Boundary Inspection Template

APPENDIX 21: ELIGIBLE FOREST AREA INSPECTION TEMPLATE

MS Word document supplied separately in Meth Appendix Folder.

Document file name: PD Appendix 21 Eligible Forest Area Inspection Template

Document title on title page: Eligible Forest Area Inspection Template

APPENDIX 22: SILNA TIMBER RESOURCES 1999

Document supplied separately in Appendix Folder.

Document file name: PD Appendix 22 SILNA Timber Resources 1999.

Document title on title page: Assessment of SILNA Timber Resources, 1999.

APPENDIX 23: STANDARD OPERATING PROCEDURE

Document supplied separately in Appendix Folder.

Document file name: PD Appendix 23 Rarakau Standard Operating Procedure.