

BEFORE THE INDEPENDENT HEARING COMMISSIONERS

IN THE MATTER of the Resource Management Act 1991 ('the Act')

AND

IN THE MATTER of proposed Canterbury Land and Water Regional Plan ('LWRP')

BETWEEN **RAYONIER NEW ZEALAND LTD**

Submitter

A N D **CANTERBURY REGIONAL COUNCIL**

Local Authority

**SUPPLEMENTARY EVIDENCE OF NICK BOYES ON BEHALF OF RAYONIER NEW ZEALAND
LIMITED**

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INTRODUCTION

- 1 My full name is Nick Boyes. My role, qualifications and experience are as described in my statement of evidence filed with the independent Hearing Commissioners ('the Commissioners') on 4 February 2013.
- 2 During the course of the hearing on 12 March 2013, a number of questions were raised regarding points in my evidence in chief ('my original evidence'), including the suite of proposed LWRP amendments attached as Appendix 2 to that evidence.
- 3 I have prepared this supplementary evidence to assist the Commissioners in making their decision on the LWRP. This includes an updated suite of proposed changes to the LWRP attached as **Appendix 1**.

RULE 5.72 (now 5.72A)

- 4 The Commissioners questioned Dr Quinn regarding his suggested wording of this rule and in particular whether his suggested wording was favoured over that provided in Appendix 2 to my original evidence.
- 5 In response Dr Quinn's answer acknowledged that both attempt to deal with the issue of periods of high flow when water clarity and sedimentation effects can be expected. Dr Quinn noted for the Commissioners that he preferred his original wording, but did not strongly preferring one over the other and acknowledged that both were better than the existing wording found in the LWRP as notified.
- 6 I note that paragraph 30 of Dr Quinn's evidence, which was not directly referred to in the questions, proposes a "*more straightforward option*", as follows-

"The second, more straightforward, option is that Rule 5.72(b) for stormwater SSC limits is deleted (or stated as not applying to forestry) and replaced by reliance on Rule 5.72(a) and the instream visual clarity change standards in Schedule 5, inclusive of the amendments discussed above. I consider that this would promote the intent of the plan to avoid unacceptable impacts of land use on water clarity and sedimentation by applying monitoring that operates at appropriate spatial and temporal scales for managing effects of forestry"

- 7 My interpretation of the phrase "*inclusive of the amendments above*" means those amendments outlined in paragraph 27 of Dr Quinn's evidence. This promotes three options for amending Rule 5.72A. The wording set out in Appendix 2 to my evidence follows the third of those options, being :

(iii) forestry be managed by a separate rule that requires adherence of a code of practice and meets water clarity change standards in Schedule 5

when flows are below the median (similar to the approach adopted in Horizon's One Plan).

8 On that basis it is my understanding that the wording suggested in my evidence is consistent with the recommendations made by Dr Quinn. One of the key justifications for the rule wording put forward was that it is simpler to administer than the other potential options (as discussed in paragraph 31 of my evidence).

9 Dr Quinn's Supplementary Evidence (paragraph 9) confirms his support for option (iii). However, Dr Quinn does suggest some further amendments for the reasons set out in paragraphs 10 to 13 of his Supplementary Evidence.

10 In summary these changes refer to:

- (a) Change in water clarity standards should apply at all flows (not only at flows below the median); and
- (b) Compliance should be monitored/measured at the spatial and temporal scales to reflect forestry's cyclical diffuse inputs.

11 In terms of (b), paragraph 13 of Dr Quinn's Supplementary Evidence suggests that additional wording be added to 5.72A 2b to clarify the appropriate spatial and temporal scales at which compliance should be assessed:

For forestry, compliance should be measured at appropriate spatial and temporal scales for forestry's cyclical diffuse inputs, namely as a 4 year rolling median at the forest estate level or below the point where the forest catchment area is less than 300 ha (or words to that effect).

12 Changes have been made to the relief sought in relation to Rule 5.72A to reflect Dr Quinn's concerns. These changes are set out in **Appendix 1**.

FLOW SENSITIVE CATCHMENTS (RULE 5.110)

13 Dr Cowie stated during his presentation that the 20 square kilometres area used to describe a 'small catchment' was fairly arbitrary. Dr Cowie suggested that this could easily refer to 50 square kilometres as suitable alternative.

14 The suggested amendment included in Appendix 2 to my original evidence used a figure of 20 ha, which should have in fact referred to km² in accordance with the assessment of Dr Cowie. As a result I have amended the wording found in Appendix 2 to my original evidence to replace 20ha with 50 km², as included in **Appendix 1** to this Supplementary Evidence.

STRUCTURES (RULE 5.115)

- 15 On reviewing the proposed changes to the LWRP set out in Appendix 2 to my evidence I noticed that the suggested amendment to Rule 5.115 used an “; or” , which didn’t fit with the existing rule structure as all other conditions are an “and”. Therefore the proposed rule has been slightly reformatted to better fit within the existing rule framework.

VEGETATION CLEARANCE IN RIPARIAN AREAS (RULE 5.147)

- 16 Appendix 2 attached to my original evidence included two potential alternative options for the relief sought by Rayonier. **Appendix 1** attached to this Supplementary Evidence clarifies the preferred relief sought.

EARTHWORKS IN RIPARIAN AREAS (RULE 5.148)

- 17 Commissioner van Voorthuysen raised a question around the replanting of areas subject to Rule 5.148 (which refers to Earthworks in Riparian Areas).
- 18 It is important to note that the LWRP as notified contained no riparian setback controls on the planting (or replanting) of plantation forest. The only controls within riparian areas relate to vegetation clearance (Rule 5.147) and earthworks (Rule 5.148). It is acknowledged that the harvesting of plantation forest would be subject to these controls.
- 19 The changes requested to the LWRP provisions through the relief sought in Appendix 2 to my original evidence introduced a 5m minimum riparian setback on replanting in circumstances where historic forestry plantings mean that harvest activity (involving earthworks and/or vegetation clearance) may occur within the setbacks contained in the LWRP (these circumstances are explained in more detail in paragraphs 46 and 51 of my original evidence). The 5m minimum replanting setback provided in order to mitigate any effects of such activity is consistent with the Environmental Code of Practice for Plantation Forestry (2007). This volunteered 5m setback was included in the changes sought to Rules 5.143 (Vegetation in Lakes and Riverbeds) and 5.147 (Vegetation Clearance in Riparian Areas). Mr Meredith discusses the financial implications for the forestry sector of larger setbacks at paragraph 80 of his evidence in chief which needs to be assessed against the environmental benefits of larger setbacks referred to by Dr Quinn at the hearing. In the context of this rule, I do not consider that a larger setback is necessary.
- 20 Otherwise the requested changes seek to provide exceptions to the conditions that apply to plantation forestry activity within the setbacks set out in a. and b. of Rule 5.147 and 5.148. Put another way, the requested changes do not propose that any

lesser setbacks should apply to vegetation clearance and earthworks in riparian areas as a result of plantation forestry.

VEGETATION CLEARANCE IN EROSION PRONE AREAS (RULE 5.150)

- 21 The relief sought that harvested areas are revegetated "*as soon as practicable and no later than 18 months...*". At the hearing I was questioned regarding the 18 month timeframe and whether the next available growing season (or words to that effect) would be more appropriate.
- 22 Unfortunately my responses left the impression that the next growing season would meet the requirements of the commercial forestry industry. However, as explained in my original evidence at paragraph 63, a longer period than simply the next growing season is required:
- The requirement set out in condition 1 that areas are replanted within 6 months is still retained in the Officers report. This can provide an operational difficulty for forestry activity given the land preparation required to be undertaken prior to establishing the next rotation and that subsequent planting can only occur within the next available planting season. It is very difficult to establish vegetation over the summer period in Canterbury and forestry planting for this reason takes place over the winter months. The common practice following harvesting is to allow the area that has been cleared to re-vegetate naturally. The area to be replanted is then sprayed with herbicide for weed control before replanting. This practice provides appropriate management of any erosion risk, but is not recognised or provided for under Condition 1.*
- 23 This land preparation process involving natural re-vegetation, then spraying, followed by planting the following growing season means that it can take up to 18 months before replanting of plantation forest occurs. The operational aspects of this process are more fully explained in the Supplementary Evidence of Mr Kelvin Meredith.
- 24 The change sought to this rule set out in Appendix 2 to my original evidence extended the timeframe for re-vegetation from 6 to 18 months for all land use activity. To overcome any concern that this general extension to 18 months for all land clearance is inappropriate, the updated set of changes attached as **Appendix 1** now splits condition 1 into two parts. Condition 1 retains the original 6 month timeframe as notified in the LWRP. A new proposed Condition 1A refers specifically to plantation forestry and allows for an 18 month timeframe for replanting.
- 25 A new condition 5 has been added specifically to deal with discharges from plantation forestry in accordance with the matters set out in the Supplementary Evidence of Dr Quinn as already referred to above.

HAZARDOUS SUBSTANCES (RULE 5.162)

- 26 Further amendments have been made to the relief sought to reflect that the 5000L storage capacity should correctly apply to any single portable container as opposed to aggregate quantity on a site. Furthermore, changes have been made in response to the comments made by Commissioner Sheppard relating to compliance with all applicable HASNO regulations.
- 27 These changes are provided in the updated rule amendments attached as **Appendix 1** to this supplementary evidence.

EROSION AND SEDIMENT CONTROL PLAN (ESCP) AND HARVEST PLAN

- 28 As discussed at the hearing, the references to the Environment Canterbury 'Erosion and Sediment Control Guideline 2007' within the proposed definition of an ESCP and Harvest Plan have been deleted from the relief sought.
- 29 The reason for this is that the Environment Canterbury Guideline is not directly applicable for forestry harvesting and earthworks. The Guideline is very similar to the Auckland TP90 guide, which acknowledges in its foreword that *"the guideline is not intended to control erosion and sedimentation associated with agricultural cultivation, other rural land uses or forestry harvesting: people undertaking these activities should refer to industry guidelines that outline the specialised controls needed for these activities;"*
- 30 On that basis the inclusion of the Environment Canterbury guideline has been removed and the preparation of the ESCP and Harvest Plan relies on the "Environmental Code of Practice for Plantation Forestry (2007)" having regard to the "New Zealand Forest Road Engineering Manual (2012)" and the "New Zealand Road Engineering Manual – Operators Guide (2012)".

GENERAL MATTERS

- 31 The amended LWRP rules attached as **Appendix 1** now also include that the ESCP and Harvest Plan documents shall be provided to the Canterbury Regional Council.
- 32 Furthermore, a clause has been added to provide for the updates of these documents to be included by reference as included in **Appendix 1**.
- 33 I hope the above comments are of some assistance.

Nick Boyes
22 April 2013

Appendix 1: LWRP Proposed Amendments

The relief sought by Rayonier is included in either **bold underlined** for text insertions and **bold strikethrough** for text deletions.

Any additional wording included in this set of changes that was not included in Appendix 2 attached to my original evidence is shown with **yellow highlight**.

Stormwater Discharge Rule 5.72 (now 5.72A)

The discharge of stormwater into a river, lake, wetland or artificial watercourse or onto or into land in circumstances where a contaminant may enter a river, lake or artificial watercourse water is a permitted activity provided the following conditions are met:

1. The discharge is into a community ~~or network utility operator~~¹⁹⁸ stormwater system

or

2. **The discharge results from plantation forestry activity, and**
 - (a) **The activity is undertaken in accordance with an Erosion and Sediment Control Plan and Harvest Plan that are provided to the Regional Council prior to the works being undertaken.**
 - (b) **Any discharge of stormwater to surface water does not, after reasonable mixing, breach the water clarity standards in Schedule 5, with compliance measured as a 4 year rolling median at the forest estate level where the upstream catchment is greater than 300ha; or downstream of the discharge point where the forest catchment area is less than 300 ha.**

or

3. The discharge is not into a community stormwater system, and¹⁹⁹

...

Flow Sensitive Catchments (Rule 5.110)

A. For catchments less than 50 km² in area:

The planting of new areas of plantation forest within any flow-sensitive catchment listed in Sections 6-15 is a **controlled permitted** activity, provided the forest planting meets the following conditions:

1. Existing areas of exotic tall vegetation, other than plantation forest, that is greater than 2 m tall and occupies more than 80% of the canopy cover and existed at 1 November 2010 may be planted in plantation forest; **and**
2. The total area of land planted in plantation forest, ~~other than land planted pursuant to condition 1,~~ does not exceed 2015% of the flow sensitive catchment or subcatchment listed in Section 6-15

total site area of a certificate of title that existed at 1 November 2010³²⁷; and

3. Information on the location, density and timing of planting is provided to Environment Canterbury for their records.

B. For larger catchments greater than 50 km²:

The planting of new areas of plantation forest within any flow-sensitive catchment listed in Sections 6-15 is a controlled activity, provided the forest planting meets the following conditions:

- 1. Existing areas of exotic tall vegetation, other than plantation forest, that is greater than 2 m tall and occupies more than 80% of the canopy cover and existed at 1 November 2010 may be planted in plantation forest; and**
- 2. The total area of land planted in plantation forest, other than land planted pursuant to condition 1, will not cumulatively cause more than a five percent reduction in the seven day mean annual low flow, and/or more than a 10 percent reduction in the mean flow.**
- 3. Information on the location, density and timing of planting is provided to Environment Canterbury for their records.**

Structures (Rule 5.115)

7. For any temporary culvert:
 - (a) the maximum width of the river bed at the point of the crossing is 5 m;
 - (b) the culvert is installed at a level no higher than bed level, and no lower than 100 mm below the level of the bed of the river or lake;
 - (c) the culvert is not placed in a water body managed for flood control or drainage purposes, unless it is undertaken by or on behalf of the CRC; and
 - (d) the culvert is not in place for more than four weeks; unless it is within a plantation forest and designed, constructed and used in accordance with an Erosion and Sediment Control Plan that is provided to the Regional Council prior to the works being undertaken, in which case the culvert shall be in place for no more than 3 months; and**

...

Note – new definitions of Erosion Sediment Control Plan (ESCP) and Harvest Plan to be inserted.

Vegetation in Lake and Riverbeds (Rule 5.143)

The introduction or planting of any plant, or the removal and disturbance of existing vegetation in, on or under the bed of a lake or river is a permitted activity, provided the following conditions are met:

1. The activity does not prevent access to lawfully established structures, including flood protection works, or to flood control vegetation;
2. No vegetation used for flood control or bank stabilisation is disturbed, removed, damaged or destroyed except by or on behalf of the person or agency responsible for maintaining that vegetation for flood control purposes;
3. No woody vegetation is disposed of in, on, over or under the bed of a lake or river;
4. Introduction or planting of vegetation in, on, or under the bed of any lake or river is not of a species listed in the Biosecurity NZ Register of Unwanted Organisms or the Canterbury Pest Management Strategy;
5. Introduction or planting of vegetation in, on, or under the bed of any river or lake listed as a high naturalness lake or river in Sections 6-15 is only of indigenous plant species that naturally occur in the catchment;
6. The disturbance, removal, damage or destroying of any plant or vegetation in, on, or under the bed of any river or lake listed as a high naturalness lake or river in Sections 6-15 is only of:
 - a) ~~species non-indigenous species;~~ **or**
 - b) **indigenous species that have grown up as the understorey of plantation forest that existed in the bed of a river or lake on or before August 2012, provided that this only occurs as part of harvesting a plantation forest and that a minimum 5m setback from the river or lake is provided on replanting.**
7. The activity does not occur in an inanga or salmon spawning site listed in Schedule 17; and
8. In a flood control rating district scheme area identified in Schedule 14, the introduction or planting of any plant, is by or on behalf of the person or agency responsible for maintaining that vegetation for flood control purposes.

Vegetation Clearance in Riparian Areas (Rule 5.147)

The use of land for vegetation clearance outside the bed of a river or lake or adjacent to a natural wetland boundary but within:

- a. 10 m ~~20 m~~⁴⁵⁷ of the bed of a lake or river or a natural wetland boundary in Hill and High Country land or land shown as High Soil Erosion Risk zoned LH2⁴⁵⁸ on the Planning Maps; or
- b. 5 m ~~10 m~~⁴⁵⁹ of the bed of a lake or river or a natural wetland boundary in all other land not shown as High Soil Erosion Risk on the Planning Maps or defined as Hill and High Country land zoned LH1 on the Planning Maps⁴⁶⁰

is a permitted activity provided the following conditions are met:

1. The area of bare ground resulting from vegetation clearance does not exceed 10% of the area within the relevant setback distance in any site at any time, except as a result of pest-plant spraying;

2. The vegetation clearance is not on land above 900 m above sea level;
3. The felling of trees, or any part of a tree, except where to ensure human safety it is not practicable to do so, is away from any lake, river or wetland and no logs or tree trunks are dragged through or across the bed of a lake or a permanently flowing river, or a wetland;
4. The vegetation clearance does not occur within 1m of a significant spawning reach for salmon or an inanga spawning area listed in Schedule 17;
5. The vegetation is not flood or erosion control vegetation; and
6. Vegetation clearance associated with recovery activities or the establishment, maintenance or repair of network utilities and fencing is not required to meet Conditions 1 and 2.

7. Vegetation clearance undertaken within plantation forest carried out in accordance with an Erosion and Sediment Control Plan and Harvest Plan that are provided to the Regional Council prior to the works being undertaken is not required to meet Conditions 1, 2 and 3.

Note - definition of Vegetation Clearance has been amended to:

Vegetation clearance means removal of vegetation by physical, mechanical, chemical or other means ~~except burning by fire~~⁴³⁴ but excludes:

- (a) cultivation for the establishment of crops or pasture;
- (b) clearance for the establishment or maintenance of utilities or structures;
- (c) removal of a species listed in the Biosecurity NZ Register of Unwanted Organisms or the Canterbury Pest Management Strategy;
- (d) clearance for the purposes of maintaining existing fence lines, vehicle tracks, firebreaks, drains, ponds, dams or crossings; or
- (e) domestic gardening and the maintenance of amenity planting.⁴³⁵

Earthworks in Riparian Areas (Rule 5.148)

The use of land for earthworks or cultivation outside the bed of a river or lake or adjacent to a natural wetland boundary but within:

- a. 10m 20m⁴⁶⁴ of the bed of a lake or river or a natural wetland boundary in Hill and High Country land and land shown as High Soil Erosion Risk zoned LH2⁴⁶⁵ on the Planning Maps; or
- b. 5 m 10 m⁴⁶⁶ of the bed of a lake or river or a natural wetland boundary in all other land not shown as High Soil Erosion Risk on the Planning Maps or defined as Hill and High Country land zoned LH1 on the Planning Maps;⁴⁶⁷

is a permitted activity provided the following conditions are met:

1. The extent of earthworks or cultivation within the relevant setback distances in any property does not at any time exceed:
 - (a) an area of 500 m², or 10% of the area, whichever is the lesser; or
 - (b) a volume of 10 m³ ~~on Hill and High Country land and land zoned LH2⁴⁶⁸~~ shown as High Soil Erosion Risk on the Planning Maps;
2. Any discharge of sediment associated with the activity into the water in a river, lake, wetland or the Coastal Marine Area does not exceed 8 hours in any 24 hour period, and does not exceed 24 hours in total in any 6 month period;
3. Any cultivation is across the contour of the land;
- ~~4. Any trenches excavated for infrastructure are back-filled and compacted within 10 days of being excavated;⁴⁶⁹~~
5. The activity does not occur adjacent to ~~within~~⁴⁷⁰ a significant spawning reach for salmon or an inanga spawning area listed in Schedule 17;
6. Any earthworks or cultivation is not within 5 m of any flood control structure; and
7. Earthworks associated with recovery activities or the establishment, maintenance or repair of network utilities and fencing is not required to meet Conditions 1, ~~or 2~~ or 6.⁴⁷¹
- 8. Earthworks undertaken within plantation forests carried out in accordance with an Erosion and Sediment Control Plan and Harvest Plan that are provided to the Regional Council prior to the works being undertaken are not required to meet Conditions 1 and 2.**

Vegetation Clearance and Earthworks in Erosion-prone Areas (Rule 5.150)

Within ~~the area shown as High Soil Erosion Risk on Area LH2 of~~⁴⁸⁰ the Planning Maps and outside any riparian margin, the use of land for:

- a. Cultivation or spraying of slopes less than ~~15°~~ 25 degrees⁴⁸¹;
- b. Cultivation or spraying on slopes greater than ~~15°~~ 25 degrees⁴⁸²; provided the total area sprayed or cultivated is less than 200 m²;
- ~~c. Vegetation clearance of species listed in the Biosecurity NZ Register of Unwanted Organisms or the Canterbury Pest Management Strategy;⁴⁸³~~
- d. Hand clearance and spot spraying of vegetation;
- e. Silvicultural practices of release cutting, pruning or thinning to waste and harvesting in accordance with an Erosion and Sediment Control Plan and Harvest Plan that are provided to the Regional Council prior to the works being undertaken prepared in accordance with the Environmental Code of Practice for Plantation Forestry (ECOP) 2007 by suspension systems;⁴⁸⁴

- f. Earthworks within a production forest undertaken in accordance with NZ Forest Road Engineering Manual (2012).⁴⁸⁵

is a permitted activity provided the following conditions are met:

1. Any cleared areas are stabilised and where it is not put to its final use shall be revegetated within 6 months from the date of the commencement of the vegetation clearance or earthworks;
- ...
3. ~~When firebreaks, roads, or tracks are constructed or maintained the maximum depth of cut or fill is 0.5 m; and or exotic forest harvesting is carried out, culverts and stormwater controls are installed and maintained to lead water via a channel into an existing watercourse~~⁴⁸⁷
- ...
4. the concentration of total suspended solids in the discharge shall not exceed:
 - (a) 50 g/m³, where the discharge is to any Spring-fed river, Banks Peninsula river, or to a lake; or
 - (b) 100 g/m³ where the discharge is to any other river or to an artificial watercourse.
- ...

5. Vegetation clearance and earthworks undertaken within a plantation forest are not required to meet conditions 1 and 4 and instead the following conditions shall apply:

- (a) any vegetation clearance and earthworks activity shall be undertaken in accordance with an Erosion and Sediment Control Plan and Harvest Plan that are provided to the Regional Council prior to the works being undertaken;**
- (b) Any cleared areas are stabilised and where it is not put to its final use shall be revegetated within 18 months from the date of the commencement of the vegetation clearance or earthworks, unless the area is left to revegetate naturally or converted to another land use; and**
- (c) Any discharge of stormwater to surface water does not, after reasonable mixing, breach the water clarity standards in Schedule 5, with compliance being measured as a 4 year rolling median at the forest estate level where the upstream catchment is greater than 300ha; or downstream of the discharge point where the forest catchment area is less than 300 ha.**

Hazardous Substances (Rule 5.162)

The use of land for the storage in a portable container and use of a hazardous substance listed in Part A of Schedule 4 is a permitted activity provided the following conditions are met:

1. The **aggregate** quantity of specified hazardous substances stored **on a site** in one **or more** portable containers does not exceed **2,000 5,000** ⁵¹⁸ litres;
2. The container(s) are located in an area, or a structure, that will contain a leak or spill of the substance and will allow the spilled substance to be collected;
3. Equipment that is suitable to absorb any leak or spill of the substance (a "spill kit") is located with the container(s) at all times, along with instructions on how to use the spill kit;
4. The container(s) are not located within
 - (a) 20 m of a surface water body or a bore;
 - (b) a group or community drinking water supply protection area as set out in Schedule 1; and

5. The storage and management of hazardous substances shall comply with all applicable HSNO regulations prepared under the Hazardous Substances and Noxious Organisms Act 1996.

~~5. The container(s) do not remain on a site for more than 90 days in any consecutive 12 month period.~~

Note: Officers have recommended that the following definition of portable container be added into Section 2.10 of the pLWRP as a consequential amendment:

Portable container means one or more containers of petrol, kerosene or diesel used for refuelling and the container(s) is fixed to a vehicle, towed by a vehicle or transported by helicopter, but does not comprise part of the inbuilt fuel system required to power a vehicle or machine.⁵¹⁹

DEFINITIONS

Section 2.10 Definitions, translations, and abbreviations: under the heading "Definitions" and after the words "... reproduced here for information purposes" insert a new sentence as follows:

"Any external documents incorporated by reference into the definitions below shall include any amendment to, or replacement of, such documents."

Culvert: Insert new definition as follows:

Culvert means a channel or conduit carrying water across or under a road.

Disturbed Land: Delete definition included in pLWRP as notified (supported by Officers)

~~Disturbed land means the disturbance of soil by any means, including blading, blasting, contouring, ripping, root raking, moving, removing, excavating, and cutting. Soil disturbance excludes disturbance as a result of vegetation disturbance activity, non-motorised soil disturbance activities, thrusting, boring or trenching or mole ploughing associated with cable or pipe laying, soil disturbance undertaken by a mine or quarry operation, cultivation and grazing, and foundation works for structures.~~

Ecosystem Services: Amend as follows:

~~Ecosystem services means the physical functioning of a fresh water body that enables ecosystems, including people and communities to exist, and includes such things as flow variability, floodways, ponding and peak flow buffering and~~ includes the goods and services provided by healthy ecosystems, including medicinal plants, clean water and air, and protection from extreme natural events⁹³.

Erosion and Sediment Control Plan: Insert the following definition (similar to that adopted in the Horizons One Plan):

Erosion and Sediment Control Plan means a plan prepared in accordance with the "Environmental Code of Practice for Plantation Forestry (2007)" and having regard to the "New Zealand Forest Road Engineering Manual (2012)" and the "New Zealand Road Engineering Manual – Operators Guide (2012)" and the "Erosion and Sediment Control Guideline 2007" prepared by Environment Canterbury.

In all cases the Erosion and Sediment Control Plan shall include, but not be limited to:

- (i) The description of the nature, scale, timing and duration of activities including construction, roading, the formation of any new track, earthworks, stabilisation and harvesting.**
- (ii) The erosion and sediment control measures to be employed and indicative locations.**
- (iii) Water run off controls.**
- (iv) Methods to avoid the slumping of batters, cuts and side castings.**
- (v) Measures to maintain slope stability.**
- (vi) Methods of sediment retention and control of sediment run off.**
- (vii) Methods to avoid effects on riparian margins and water bodies.**
- (viii) Re-vegetation requirements.**
- (ix) Detail heavy rainfall response and contingency measures.**
- (x) Identify maintenance and monitoring procedures.**
- (xi) Identify procedures for review and amendment to the Erosion and Sediment Control Plan, and**
- (xii) Relevant Harvest Plans (including maps and associated text).**

Harvest Plan: Insert the following definition (similar to that adopted in the Horizons One Plan):

Harvest Plan means a plantation forest Harvest Plan prepared in accordance with the "Environmental Code of Practice for Plantation Forestry (2007)" and having regard to the "New Zealand Forest Road Engineering Manual (2012)" and the "New Zealand Road Engineering Manual – Operators Guide (2012)" and the "Erosion and Sediment Control Guideline 2007" prepared by Environment Canterbury. Any Harvest Plan must include a Harvest Plan Map and associated text. The Harvest Plan Map must be produced at between 1:5,000 up to 1:10,000 scale and must include, but not be limited to, the following:

- (i) **Title, date and north arrow.**
- (ii) **The harvest area boundary.**
- (iii) **Any property boundaries in the vicinity of the harvest area.**
- (iv) **Contours.**
- (v) **Location of all proposed and existing roads, tracks, landings, firebreaks, stream crossings and associated culverts.**
- (vi) **Harvesting methodology (hauler or ground-base) and proposed extraction directions.**
- (vii) **Location of any water bodies, perennial streams and the bed of any lake.**
- (viii) **Location of any wetland identified in Schedules 9 and 10.**
- (ix) **Location of any known historic heritage or waahi tapu sites, outstanding natural features and landscapes, areas of significant indigenous vegetation and habitats of significant indigenous fauna identified in any district or regional plan.**
- (x) **Location of slash management and disposal areas for hauler landings.**
- (xi) **Location of end haul disposal areas, and**
- (xii) **Any other area relevant to managing the harvest area.**

Non-point Discharge: Amend definition as follows:

"Non-point **source** discharge means run-off or leachate from land onto or into land, a water body or the sea".

Plantation Forest: Amend definition as follows:

"Plantation forest means includes all areas of trees grown for harvest or as a carbon sink forest with a density of 150 or more stems per hectare. A forest of selected species of trees that are specifically planted and managed for a carbon sink or planted and managed specifically for harvesting and production of timber or other wood based products, and includes under-storey that has established beneath the canopy and areas that are demonstrated to be failed plantings from the previous rotations."

Reasonable Mixing Zone: Amend definition as follows:

"Reasonable mixing means the mixing that occurs in a mixing zone as defined in Schedule **8 5** of this plan".