

16 March 2011



WASTEWATER TREATMENT PLANT AND LANDFILL JOINT COMMITTEE

A Joint Committee of the Porirua and Wellington City Councils

Notice is hereby given that, commencing at 3.30pm on Monday 21 March 2011, an extraordinary meeting of the WASTEWATER TREATMENT PLANT AND LANDFILL JOINT COMMITTEE will be held in the PORIRUA CITY COUNCIL CHAMBER, ADMINISTRATION BUILDING, HAGLEY STREET, PORIRUA CITY, to conduct the business set out as under.

TERMS OF REFERENCE

To provide governance for the joint services entered into by the Porirua and Wellington City Councils through the joint venture agreements for the Wastewater Treatment Plant and the Spicer Valley Landfill.

MEMBERSHIP

Porirua City Council:

Cr T M Sheppard (Chairperson)

Cr S M Dow

Cr B E Kropp

Wellington City Council:

Cr N Best (Deputy Chairperson)



Gary Simpson
CHIEF EXECUTIVE

SCOPE OF ACTIVITY

To consider and make recommendations to both Councils regarding:

- *overview, input and policy formulation in the areas of management of the Spicer Valley joint landfill operation, and the Wastewater Treatment Plant, as set out in the joint venture agreements, entered into by both Councils, including development of Trade Waste Bylaws.*
- *proposals for infrastructural development relating to the joint ventures*
- *new initiatives relating to the joint ventures*
- *the Spicer Forest partnership agreement between Greater Wellington Regional Council, Wellington City Council and Porirua City Council on land surrounding the Spicer Valley Landfill*
- *the budget for operation of the joint ventures for inclusion in the Councils' Annual Plans / Long Term Council Community Plans*
- *receipt of the Annual Report of the joint ventures for inclusion in the Councils' Annual Reports*
- *any proposed service changes*

POWER TO ACT

The powers of the Joint Standing Committee as described in the Deed Relating to Joint Works dated 22 December 1986 and the powers of the Joint Committee as described in the Agreement Relating to Joint Refuse Disposal Works dated 2 May 1983

Setting of fees and charges related to the operation of the Spicer Valley Landfill and recommending the basis for charging for trade wastes at the Wastewater Treatment Plant

Decisions on acceptance of wastes into the Spicer Valley Landfill and Wastewater Treatment Plant

ORDER OF BUSINESS

PAGE

1. APOLOGIES

2. CONFIRMATION OF MINUTES

Meeting held 9 February 2011

CHAIRPERSON'S RECOMMENDATION

1

That the minutes be adopted as a true and correct record.

3. ITEMS FOR DECISION

3.1. SPICER LANDFILL – DISPOSAL CHARGES REVIEW

5

Report #652662 of the General Manager Asset Management and Operations dated 18 February 2011

CHAIRPERSON'S RECOMMENDATION

That the Wastewater Treatment Plant and Landfill Joint Committee recommend:

- 1. That Porirua City Council agree to increase landfill charges at Spicer Landfill by 9% from 1 July 2011.*
 - 2. That Wellington City Council agree that Porirua City Council increases landfill charges at Spicer Landfill by 9% from 1 July 2011.*
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3.2. SPICER FOREST – OPTIONS FOR FUTURE USE AND MANAGEMENT 13

Report #654701 of the General Manager Asset Management and Operations dated 28 February 2011

CHAIRPERSON'S RECOMMENDATION

That the Wastewater Treatment Plant and Landfill Joint Committee recommend:

1. *That a delegation be given to Porirua City Council officers to continue discussions with Wellington City Council officers for a new joint management agreement for forestry and recreational opportunities for Spicer Forest; and to negotiate the exit of Greater Wellington Regional Council from the existing arrangement for the management of Spicer Forest; and to report back to this committee on any potential settlement issues with Greater Wellington Regional Council.*
2. *That a delegation be given to Wellington City Council officers to continue discussions with Porirua City Council officers for a new joint management agreement for forestry and recreational opportunities for Spicer Forest; and to negotiate the exit of Greater Wellington Regional Council from the existing arrangement for the management of Spicer Forest; and to report back to this committee on any potential settlement issues with Greater Wellington Regional Council.*

4. PUBLIC EXCLUDED BUSINESS**COUNCIL TO RESOLVE**

That the public be excluded from the following parts of the proceedings of this meeting namely:

- a) *Confirmation of Minutes*
- b) *Contract No. 1467 – Tangare Drive Wastewater Pump Station Upgrade Tender Report*

That the general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under Section 48(1) of the Local Government Official Information and Meetings Act 1986 for the passing of this resolution are as follows:

<i>General subject of each matter to be considered</i>	<i>Reason for passing this resolution in relation to each matter</i>	<i>Grounds under Section 48(1) for the passing of this resolution</i>
<i>a) Confirmation of Minutes re: Contract No 1470 Porirua Wastewater Treatment Plant New Clarifier Tender Report.</i>	<i>Section 7(2)(h)- Enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities and Section 7(2)(i) - Enable any local authority holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial or industrial negotiations).</i>	<i>The public conduct of the relevant part of the proceedings would be likely to result in a disclosure of information for which good reason for withholding that information would exist, under Section 7 of the Local Government Official Information and Meetings Act 1987.</i>
<i>b) Contract No 1467 Tangare Drive Wastewater Pump Station Upgrade Tender Report</i>	<i>Section 7(2)(h)- Enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities.</i>	<i>The public conduct of the relevant part of the proceedings would be likely to result in a disclosure of information for which good reason for withholding that information would exist, under Section 7 of the Local Government Official Information and Meetings Act 1987.</i>

This resolution is made in reliance on Section 48(1) of the Local Government Official Information and Meetings Act 1987 and the particular interests protected by Section 6 or Section 7 of the Act which would be prejudiced by the holding of the whole or the relevant part of the proceedings of the meeting in public as specified above.

WASTEWATER TREATMENT PLANT AND LANDFILL JOINT COMMITTEE

Minutes of an Extraordinary Wastewater Treatment Plant and Landfill Joint Committee meeting held in the Council Chambers, Administration Building, Hagley Street, Porirua on Wednesday 9 February 2011 at 4.10pm.

PRESENT

Porirua City Council: Cr T M Sheppard (Chairperson)
Cr S M Dow
Cr B E Kropp

Wellington City Council: Cr N Best

IN ATTENDANCE

Porirua City Council: N O Leggett (Mayor)
Cr D C Latham

OFFICERS

Porirua City Council: P Bailey General Manager Asset Management and Operations
P Keller Solid Waste Manager
G Marshall Manager Technical Services
P Nordberg Manager Water and Drainage Assets
S Mika Committee Advisor

Wellington City Council: M Archer Manager, Infrastructure Planning

04/11 CONFIRMATION OF MINUTES

Meeting held 24 November 2010

RESOLVED (Sheppard / Dow)

That the minutes be adopted as a true and correct record.

CARRIED

GENERAL BUSINESS

05/11 JOINT WASTE SERVICE DELIVERY

Councillor Best requested an update with the joint waste service delivery. The General Manager Asset Management and Operations verbally updated and reported on the timelines. This issue is still in progress and will report further when the work is completed.

RESOLVED (Sheppard / Kropp)

That the public be excluded from the following parts of the proceedings of this meeting, namely:

- a) **Contract No 1470: Porirua Wastewater Treatment Plant – New Clarifier – Tender Report**

That the general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under Section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution are as follows:

General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Grounds under Section 48(1) for the passing of this resolution
a) Contract No 1470: Porirua Wastewater Treatment Plant – New Clarifier – Tender Report	Section 7(2)(h)—Enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities; and Section 7(2)(i)—Enable any local authority holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial or industrial negotiations)	The public conduct of the relevant part of the proceedings would be likely to result in a disclosure of information for which good reason for withholding that information would exist, under Section 7 of the Local Government Official Information and Meetings Act 1987.

This resolution is made in reliance on Section 48(1) of the Local Government Official Information and Meetings Act 1987 and the particular interests protected by Section 6 or Section 7 of the Act which would be prejudiced by the holding of the whole or the relevant part of the proceedings of the meeting in public as specified above.

CARRIED

For item 07/11 refer to public excluded minutes.

The meeting closed at 4.13pm.

Approved and adopted as a true and correct record:

.....
CHAIRPERSON

.....
DATE



WASTEWATER TREATMENT PLANT AND LANDFILL JOINT COMMITTEE

MEETING OF 21 MARCH 2011

Asset Management & Operations
18 February 2011

SPICER LANDFILL - DISPOSAL CHARGES REVIEW

PURPOSE

The purpose of this report is to seek approval for an adjustment to the landfill charges for Spicer Landfill.

SIGNIFICANCE OF DECISION

Council's significance policy is not triggered by this decision as no policy thresholds are triggered requiring consideration as a strategic issue.

RECOMMENDATIONS

That the Wastewater Treatment Plant and Landfill Joint Committee recommend:

1. That the Porirua City Council **agree** to increase landfill charges at Spicer Landfill by 9% from 1 July 2011.
2. That Wellington City Council **agree** that Porirua City Council increases landfill charges at Spicer Landfill by 9% from 1 July 2011.

Report prepared by:

A handwritten signature in black ink, appearing to read 'Peter Keller'.

Peter Keller
SOLID WASTE MANAGER

Approved for submission by:

A handwritten signature in black ink, appearing to read 'Peter Bailey'.

Peter Bailey
GENERAL MANAGER ASSET MANAGEMENT AND OPERATIONS

1 EXECUTIVE SUMMARY

- 1.1 The operation of Spicer landfill is paid for by user charges, not rates. These charges pay for landfill operating and maintenance costs and for levies imposed by central government.
- 1.2 Landfill charges (ignoring changes to GST and the imposition of the Waste Levy by central government) have not been increased since June 2006.
- 1.3 Spicer landfill's charges are lower than the other two landfills in the region, whereas in January 2009 they were effectively the same. There is some evidence that waste is being diverted to Spicer because of ease of access and the lower price.
- 1.4 A fee increase is required to:
 - Disincentivise waste diversion to Spicer with consequential environmental and social impacts due to increased transport;
 - Reduce the risk of shortening the life of the landfill; and
 - Provide a financial incentive for customers to consider alternatives to landfilling such as reuse and recycling.
- 1.5 A fee increase would contribute to both Councils' strategic focus in their Long Term Plans by providing a financial incentive to reduce waste to landfill.
- 1.6 A cautionary approach is recommended with an increase of 9%.
- 1.7 For householders an increase of 9% would increase the charge for a car load of waste by \$1.20. It is unlikely that a fee increase of 9% would significantly affect resident's ability to pay or increase negative behaviour such as fly tipping.
- 1.8 Landfill quantities will continue to be monitored, and in a future paper recommendations may be made to further increase charges.

2 CONTRIBUTION TO COUNCILS' STRATEGIES

- 2.1 This review contributes to both Councils' strategic focus in their Long Term Plans by providing a financial incentive to reduce waste to landfill:
 - "Waste Reduction is fundamental to Council's commitment to sustainable development and to reducing Greenhouse gas emissions"¹, and
 - "The city will reduce its impact on the environment through more efficient use of energy, water, land and other resources, and by minimising waste"².

¹ Refer paragraph titled "Why", Page 151, 2009-2019 Porirua City LTCCP

² Page 54, Wellington City Long Term Plan 2009-19

PCC - #652662-v5

3 BACKGROUND

- 3.1 Spicer Landfill is a joint venture (JV), jointly owned by Porirua City Council (78.5%) and Wellington City Council (21.5%). The landfill is managed by officers of Porirua City Council on behalf of the JV.
- 3.2 The operation of Spicer landfill is paid for by user charges, not rates. Landfill income is solely from charges to landfill users. These charges pay for landfill operating and maintenance costs and for levies imposed by central government.
- 3.3 Landfill charges (ignoring changes to GST and the imposition of the Waste Levy) have not been increased since June 2006 when they were set at \$80/tonne (including GST)³.
- 3.4 Landfill charges were adjusted in October 2010 to account for the increase in GST from 12.5% to 15%, and before that in July 2009 to account for the \$10/tonne Waste Levy imposed by central government as part of the Waste Minimisation Act 2008.
- 3.5 The income from the Waste Levy goes completely to central government. Although Council receives some of this money back through the Sustainable Management Fund, the amount received depends only on the population of the city, and not on the amount levied. The amount received from central government by Council is therefore not linked to landfill charges.
- 3.6 At the time of the review in January 2009³ to increase charges for the Waste Levy, Spicer's charge of \$80/tonne was \$2/tonne lower than Southern landfill and \$2/tonne higher than Silverstream Landfill. The landfill charges were effectively the same for all three landfills.
- 3.7 In the interim Spicer's charges have fallen behind the other two landfills. Currently (Feb 2011) landfill charges for general waste are:
 - Southern \$100.09/tonne;
 - Silverstream \$97.40/tonne; and
 - Spicer \$93.30/tonne.
- 3.8 This paper investigates the costs and benefits of adjusting Spicer's charges, and recommends that charges be increased.

4 DISCUSSION AND OPTIONS CONSIDERED

- 4.1 With respect to possible changes in charges there are three options:
 - Reduce charges;
 - Maintain the status quo; and
 - Increase charges.

³ Report to JV Committee 14 Jan 2009 #438812 v1
PCC - #652662-v5

- 4.2 In the following discussion the importance of maintaining relativity to other landfills in the region, the increasing cost of provision of the landfill service, customers' ability to pay and the possible effect on avoidance (fly tipping) as a result of changing landfill charges are discussed.

Relativity to other Landfills

- 4.3 As noted above, Spicer's charges are substantially lower than the other two landfills in the region, whereas in January 2009 they were effectively the same.
- 4.4 Currently the difference between Southern and Spicer is \$6.79 per tonne and it is possible, but not certain, that Southern's charges will increase. This is an option that has been noted recently in the news media⁴.
- 4.5 An increase in the price difference, for example if Spicer reduced its charges, would make it more attractive for commercial operators to drive to Spicer to dispose of their waste. This would have two negative consequences, namely:
- An increase in environmental and social impacts such as greenhouse gas emissions, road damage and traffic accidents due to the increased use of truck transport; and
 - A more rapid filling of Spicer with a consequent reduction in the landfill life.
- 4.6 Consequently a reduction in landfill charges is not recommended.
- 4.7 There is some evidence (anecdotal and by analysis of the comparative waste flows) that commercial operators already prefer Spicer over Southern because of ease of access and possibly the lower price, and therefore divert their trucks to Spicer.
- 4.8 An increase in landfill charges to the same level as the other landfills would have the following positive effects:
- It would re-establish parity between the three landfills in the region;
 - It would help to ensure that waste is not unnecessarily diverted to Spicer with consequent environmental and social costs and the risk of shortening the life of the landfill; and
 - It would provide a financial incentive for customers to consider alternatives to landfilling such as reuse and recycling.
- 4.9 This last point is aligned with both Councils' policies of waste reduction.
- 4.10 It could be argued that Council should be aiming to set landfill prices even higher to further incentivise diversion from landfill through recycling. However at some point waste would be diverted away from Spicer to Southern or Silverstream.

⁴ Dominion Post
PCC - #652662-v5

- 4.11 A cautionary approach is recommended at this stage with an increase of 9%, or \$8.40/tonne, to \$101.70/tonne (all including GST), slightly higher than the charge currently used at Southern.
- 4.12 Landfill quantities will continue to be monitored, and in a future paper recommendations may be made to further increase charges.

Cost of Provision of Service – Possible Risks

- 4.13 The provision of a landfill service has a cost which is met by income from landfill charges. The current status, possible cost increases and possible risks to landfill income are discussed as follows.
- 4.14 *Funding of Service* – Currently income exceeds expenditure (including overheads but excluding depreciation)⁵ so the landfill does not need to be funded from rates.
- 4.15 *Operating Cost Increases* – The landfill operator is entitled to a quarterly increase in his fee to cover increases in his costs. This is as prescribed in the contract documents and the amount is calculated using Statistics New Zealand indices for labour and material cost increases.
- 4.16 Since mid 2006 operating costs have increased in line with these cost indices by approximately 18%. In comparison the landfill charges at Spicer exclusive of GST and the Waste Levy, which both go to central government, have not increased.

Date	Cause of increase	Fee (\$/tonne, general waste)	
		<i>incl.</i> GST and levies	<i>excl.</i> GST and levies
July 2006	Market rate policy	\$80	\$71
July 2009	Waste Levy	\$91.25	\$71
Oct 2010	Increase in GST	\$93.30	\$71

- 4.17 In line with Porirua City Council's policy on setting fees and charges, charges cannot be increased because of increased costs as income exceeds expenditure. This is despite operating costs increasing significantly since 2006 when charges were last increased.
- 4.18 *New contracts due* – the existing operating contract expires at the end of September 2011 and tenders will be sought for a new contract in March. Depending on the tender prices received, there is some risk of cost increases relative to the current contract price.
- 4.19 *Ability to fund capital works* – the current landfill income should be enough to fund capital works without permanently drawing down the reserve.

⁵ Due to the market rate pricing structure required in Council's Solid Waste Management Plan 2006
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4.20 *Waste disposal trends* – Landfill income is directly linked to tonnage of waste to the landfill. This has been steady at 63,000 +/- 3000 tonnes/y for the last four years. There is some indication that tonnages may be dropping but given the limited data available, the current expectation is that tonnages will remain at 63,000 tonnes/y.

4.21 *Emissions Trading Scheme (ETS) charges* - Potential ETS Charges for Spicer are currently estimated at \$850k/y at \$20/Tonne CO₂e. This would be a significant cost requiring a future fee increase but for several reasons can't be adequately quantified at present. These reasons include:

- The price for CO₂ may or may not rise;
- ETS charges only apply from 1/1/2013, and are payable from 1/1/2014; and
- It is too early to predict if the existing ETS regulations regarding landfills will remain as they are, especially given the lack of clarity and potential loopholes that are becoming apparent.

Ability to Pay

4.22 It is unlikely that a fee increase of 9% would substantially affect the ability of users to pay:

- For householders using a car, an increase of 9% would increase the charge for a car load of waste by \$1.20 to \$14.50 and a trailer by \$2.60 to \$31.20.
- For commercial users of the landfill the fee increase will restore parity with other landfills in the region and set Spicer's charge slightly higher than Southern's.

Risk of Avoidance

4.23 It is unlikely that a fee increase of 9% would substantially increase fly tipping. Fly tipping is mostly smaller quantities from households. Increases in rubbish bag charges, for example, have shown a short term effect such as an increase in the use of non Council bags, but this abated after a few weeks.

5 OPERATIONAL IMPLICATIONS

5.1 Capital and operating expenditure are directly linked to landfill quantities. Quantities are unlikely to be significantly affected by a fee increase of 9%.

5.2 Assuming acceptance of the recommendations of this report by this Committee and subsequently by Council, the proposed increase in fee will be advertised in the local media and on Council's website in June prior to the increase taking effect from 1st July 2011.

5.3 Major customers, for example those with accounts, will also be informed by letter in June.

6 FINANCIAL IMPLICATIONS

- 6.1 Financial implications are discussed above in sections 4 and 5. Landfill expenditure, including provision for future capital works and overheads, is expected to be covered by income.
- 6.2 The 2011/12 Annual Plan has the proposed increase in price already incorporated into the budgets.

7 STATUTORY REQUIREMENTS

- 7.1 There are no significant legal implications associated with this decision.
- 7.2 This review is aligned with Council's policies as described in its Solid Waste Management Plan, Spicer Landfill Asset Management Plan, Revenue and Financing Policy and the Policy on Setting Fees and Charges.
- 7.3 In accordance with s46 (2) of the Waste Minimisation Act 2008, Council can charge fees for a facility that are higher or lower than required to recover the costs to provide the service, providing the incentives or disincentives will promote waste minimisation.

8 CONSULTATION

- 8.1 Given that a price increase of 9% is unlikely to affect the ability of users to pay, or cause an increase in fly tipping, or increase environmental impacts associated with increased transport of waste, consultation with the community has not been carried out to date.

9 CONCLUSION

- 9.1 Spicer Landfill's charges are substantially lower than the other two landfills in the region, whereas in January 2009 they were effectively the same.
- 9.2 There is evidence that waste is already being diverted to Spicer because of ease of access and the lower price.
- 9.3 A fee increase is required to:
 - Disincentivise waste diversion to Spicer with consequential environmental and social impacts due to increased transport;
 - Reduce the risk of shortening the life of the landfill; and
 - Provide a financial incentive for customers to consider alternatives to landfilling such as reuse and recycling.

- 9.4 A fee increase would contribute to both Councils' strategic focus in their Long Term Plans by providing a financial incentive to reduce waste to landfill.
- 9.5 A cautionary approach would be an increase of 9%. This would increase the fee for general waste to \$101.70/tonne (including GST); slightly higher than the charge currently used at Southern.
- 9.6 Landfill quantities will continue to be monitored, and in a future paper recommendations may be made to further increase charges.
- 9.7 Landfill expenditure is expected to continue to be covered by income.
- 9.8 For householders an increase of 9% would increase the charge for a car load of waste by \$1.20. It is unlikely that a fee increase of 9% would significantly affect resident's ability to pay or increase negative behaviour such as fly tipping.
- 9.9 There are no significant legal implications associated with this decision.

10 ATTACHMENTS:

- 10.1 None

SPICER FOREST - OPTIONS FOR FUTURE USE AND MANAGEMENT

PURPOSE

Spicer Forest is a joint venture between Porirua City Council and Wellington City Council who are the landowners; and Greater Wellington Regional Council who manage the forest. The forest is scheduled to be clear-felled in 2016 with financial, environmental and land use implications for both landowners. This report looks at potential options for the future use and management of the forest.

SIGNIFICANCE OF DECISION

Porirua City Council's Significance Policy is not triggered by the matters considered in this report.

RECOMMENDATIONS

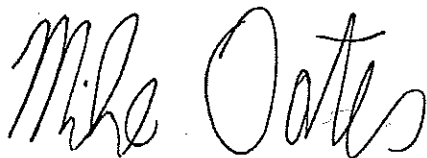
That the Wastewater Treatment Plant and Landfill Joint Committee recommend:

1. That a delegation be given to Porirua City Council officers to continue discussions with Wellington City Council officers for a new joint management agreement for forestry and recreational opportunities for Spicer Forest; and to negotiate the exit of Greater Wellington Regional Council from the existing arrangement for the management of Spicer Forest; and to report back to this committee on any potential settlement issues with Greater Wellington Regional Council.
2. That a delegation be given to Wellington City Council officers to continue discussions with Porirua City Council officers for a new joint management agreement for forestry and recreational opportunities for Spicer Forest; and to negotiate the exit of Greater Wellington Regional Council from the existing arrangement for the management of Spicer Forest; and to report back to this committee on any potential settlement issues with Greater Wellington Regional Council.

Report prepared by:



Karyn Stillwell
MANAGER, LEISURE ASSETS & SERVICES



Mike Oates
**MANAGER, OPEN SPACE AND RECREATION PLANNING
WELLINGTON CITY COUNCIL**

Approved for submission by:



Peter Bailey
**GENERAL MANAGER ASSET MANAGEMENT AND OPERATIONS
PORIRUA CITY COUNCIL**



Neville Brown
**DIRECTOR – CITY SERVICES
WELLINGTON CITY COUNCIL**

1 EXECUTIVE SUMMARY

- 1.1 This report gives options for the future of Spicer Forest and recommends that it is in both Councils' best interests to regain more control over the outcome of the forest which can be achieved by negotiating Greater Wellington's exit out of the joint venture.

2 CONTRIBUTION TO COUNCILS' STRATEGIES

- 2.1 The management and future of Spicer Forest contributes to all four of Porirua City Council's Strategic Focus Areas, as identified in their 2009-2019 Long Term Council Community Plan (LTCCP). It also contributes towards four of Wellington City Council's long term outcomes in their 2009-2019 LTCCP.

3 BACKGROUND

- 3.1 In 1983, Porirua City Council (PCC) and Tawa Borough Council entered into a 'Joint Refuse Disposal Works Agreement' to provide for public works for the mutual benefit of their respective districts. The agreement covered Spicer Landfill which had already been established; and part of the remainder of the land was to be planted in radiata pine as a production forest. All costs and any revenue associated with the joint works were to be apportioned 77% towards PCC and 23% against Tawa Borough and were based around the population ratio between the two authorities at this time. The agreement was signed and a joint committee established to provide governance.
- 3.2 The Regional Council was then engaged by Porirua City and Tawa Borough to plant, tend and manage the land set aside for forest development. All costs associated with the forest venture were to be met by the Regional Council with this capital outlay and risk recognised by a higher share of the net profits. The Regional Council's share of the net profit was to be 66% with the remaining 34% to be split between the landowners. Porirua City Council was to receive 26% of the net profit and Tawa Borough approximately 8%. The forest was planted in 1986 under a 'gentleman's agreement' between the three parties, with all subsequent attempts to formalise the arrangement being unsuccessful. This was primarily due to local body reorganisation that was to occur in three years time.
- 3.3 In 1989, Tawa Borough's interest in the land was vested with Wellington City Council after the Local Government Reorganisation. When the local body boundaries were altered to reflect the amalgamation, Wellington City inherited 56ha of land covered under the original joint venture (JV) agreement, 40ha of which was planted in the pine forest. Porirua City Council has landholdings in the forest of 32ha.

Discussion and Options considered:

- 3.4 In fulfilling the agreement to realise the timber value of the forest, the ecological, recreational and amenity values of the WCC and PCC landholdings will clearly be affected. The attached discussion document (see Appendix One) identifies the impact that clear-felling will have on these values and provides forest management scenarios that could mitigate this impact. In broad outline they amount to four options.
- 3.5 **Option 1a:** Clear-fell the pine forest in 2016 and manage the land back into an indigenous vegetation cover (this is the current position).
- 3.6 **Option 1b:** Clear-fell the pine forest in 2016 and replant back into an exotic vegetation cover.
- 3.7 **Option 2:** Staged logging of the forest over several decades, gradually returning the land back into an indigenous vegetation cover.
- 3.8 **Option 3:** Retain the pine forest and manage for longevity, developing recreation opportunities and managing for multiple use values.
- 3.9 **Option 4:** Retain part of the forest and manage in perpetuity while logging the remainder of the trees in stages over several decades.

4 OPERATIONAL IMPLICATIONS

- 4.1 Options 1a and 1b could be implemented within the confines of the current agreement with Option 2 requiring negotiations with Greater Wellington to a change in the harvest arrangements. Options 3 and 4 will require the Regional Council's early exit from the joint venture and a new management agreement developed between Porirua City Council and Wellington City Council.
- 4.2 Officers have commissioned some preliminary work on Option 3 and 4 (see Attachment Two) to enable the development of recreation opportunities. There is potential for a significant active recreation park to be developed utilising Spicer Forest and the surrounding Colonial Knob land, DoC land and Porirua Scenic Reserve. There are opportunities for multiple non-motorised recreation opportunities to be developed in the future, such as mountain biking, walking, running, horse riding and other family friendly activities. The impact of a logging access road (through to the proposed Meridian Wind Farm) has yet to be discussed and any investment in a recreational park in the area would be subject to a successful bid (by both Councils) through their respective 2012-2022 LTCCPs. No work has been done on the cost implications of Options 3 and 4, as the discussions have only been preliminary but officers would like the opportunity to investigate this option in more depth.

5 FINANCIAL IMPLICATIONS

5.1 A summary of the projected revenue and expected costs (as at October 2009) are outlined in the following table (please see Attachment One for further details):

Options	Log Revenue	Shareholder Revenue			Post Logging Costs	
		GWRC	WCC	PCC	WCC	PCC
1a. Clearfell forest in 2016, retaining 10ha of pines above landfill (replant in Natives)	\$660,320	\$500,245	\$36,673	\$123,399	\$294,280	\$777,735
1b. Clearfell forest in 2016 and replant in exotics.	\$757,615	\$500,245	\$58,972	\$198,396	\$214,073	\$143,007
2. Staged clearfell of forest over a 50 yr period.	\$757,615	\$500,245	\$58,972	\$198,396	\$481,280	\$1,426,830
3. Retain Existing Forest.	\$0	\$0	\$0	\$0	\$107,000	\$107,000
4. Retain part Forest – staged clearfell the remainder (over 50 yr period)	\$534,790	\$0	\$267,395	\$267,395	\$510,680	\$619,000

6 STATUTORY REQUIREMENTS

6.1 At this stage there are no significant legal implications associated with initiating discussions on the future management of Spicer Forest.

7 CONSULTATION

7.1 As a mandate is being sought from the Wastewater Treatment Plant and Landfill Joint Committee for officers to commence discussions and negotiations on the future of Spicer Forest, there has been no external consultation at this stage.

8 CONCLUSION

8.1 A number of options exist for the future management of Spicer Forest, as outlined in Section 3 of this report. These options have significant financial implications for both PCC and WCC if Spicer Forest is clear felled in 2016 as planned. Officers have done some preliminary work on Options 3 and 4, which involves retaining the pine forest and/or some limited felling over time, and developing recreational opportunities. Further discussions need to be initiated with Greater Wellington over the future of the forest, and these discussions will assist with decision making. Officers from both PCC and WCC are seeking a mandate from the Committee to

commence discussions with GWRC on the future of Spicer Forest, with a view to reporting back to the Committee at a later date.

9 ATTACHMENTS:

- #654701 - Appendix One:
Spicer Forest JV Forest Management Option - Discussion Document Oct 2009
- #654470 - Appendix Two:
Recreation Activity Areas for Spicer Forest, Colonial Knob, Spicer Botanical Park

Spicer Forest Joint Venture Forest Management Options

Discussion Document | October 2009

Absolutely

POSITIVELY

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Spicer Forest Joint Venture Forest Management Options

**A Discussion Document exploring the Spicer Forest partnership
between Wellington City Council, Porirua City Council and
Greater Wellington Regional Council.**

Executive Summary

Spicer forest is a radiata pine joint venture forest between Wellington City Council, Porirua City Council and Greater Wellington Regional Council. The forest was planted in 1986 and is scheduled for logging in 2016.

In fulfilling the agreement to realise the timber value of the forest the ecological, recreational and amenity values of Wellington City Council and Porirua land will be adversely affected. This discussion document identifies the impact that clear-felling will have on these values and provides forest management scenarios that could mitigate this impact. In broad outline they amount to four:

- 1a. Clear-fell the pine forest in 2016 and manage the land back into an indigenous vegetation cover (this is the present intention).
- 1b. Clearfell the pine forest in 2016 and replant back into an exotic vegetation cover.
2. Staged logging of the forest over several decades, gradually returning the land back into an indigenous vegetation cover.
3. Retain the pine forest and manage for longevity developing recreation opportunities and managing for multiple use values.
4. Retain part of the forest and manage in perpetuity while logging the remainder of the trees in stages over several decades.

Options 1a and 1b could be implemented within the confines of the current agreement with Option 2 requiring negotiations with Greater Wellington to a change in the harvest arrangements. Options 3 and 4 would require the Regional Councils early exit from the joint venture. The projected revenue and expected costs are outlined under each option. These have been summarised in the table below.

Option	Log Revenue	Shareholder Revenue			Post Logging Costs	
		GWRC	WCC	PCC	WCC	PCC
1a. Clearfell forest in 2016, retaining 10ha of pines above landfill. Replant in native.	\$660,320	\$500,245	\$36,673	\$123,399	\$294,280	\$777,735
1b. Clearfell forest in 2016 and replant in exotics.	\$757,615	\$500,245	\$58,972	\$198,396	\$214,073	\$143,007
2. Staged clearfell of forest over a 50yr period	\$757,615	\$500,245	\$58,972	\$198,396	\$481,280	\$1,426,830
3. Retain Existing Forest	\$ 0	\$ 0	\$ 0	\$ 0	\$107,000	\$107,000
4. Retain part forest – staged clear-fell the remainder over 50 yr period.	\$534,790	\$ 0	\$267,395	\$267,395	\$510,680	\$619,000

The purpose of this discussion document is to highlight the impending clearfell logging operation and the implications this will have for Spicer forest shareholders and wider community. It is intended to stimulate a decision making process by the two landowners, Porirua City Council and Wellington City Council, and in consensus with Greater Wellington, agree upon a mutually beneficial forest management option.

Introduction

Spicer forest covers some 73 hectares of Wellington City Council and Porirua City Council owned land and is located at the head of the Ohariu Valley. The forest fills the headwaters of the Ohariu Stream catchment, spilling over a saddle above the Porirua landfill site. The forest extends eastwards to cross the ridgeline separating the Ohariu and Porirua catchments to cover the hill slopes above Tawa. On this eastern side the forest is contiguous with the Forest of Tane, a privately owned plantation that was planted at the same time as the Councils forest. Most of both Spicer forest and the Forest of Tane fall within the Wellington City Councils 'Ridges and Hilltops Overlay' and are part of Wellingtons 'Outer Green Belt'. The land varies between 100 and 300 metres in altitude.

The area occupied by Spicer forest has the potential to be used for a range of activities additional to timber production, or as alternatives to timber production. Under current arrangements, the forest is scheduled to be logged in 2016.

Agreements, amalgamation and financial interests

In 1983, Porirua City Council and Tawa Borough entered into an agreement to carry out works pursuant to the Local Government Act 1974. The 'Agreement Relating To Joint Refuse Disposal Works' provided for the 'execution and maintenance of public works for the mutual benefit of the respective districts including; refuse disposal, land development for housing, commercial and industrial purposes, and farming and afforestation'. The refuse disposal site had already been established and operational as Spicer Landfill since 1976 and this was also encapsulated under the agreement¹. Appendix 1 shows the original land area set aside for these works.

A joint committee was established to manage the works and to make recommendations to their respective Councils any issues arising. Any revenue derived from joint works was to be apportioned to Porirua and Tawa based on the population ratio difference between the two local bodies. At the time of the agreement in 1983 this was;

Shareholder	Population 1983	Ratio %
Porirua City Council	41,104	77.089
Tawa Borough	12,216	22.911
		100%

The agreement did make provisions for updating the difference in population ratio at five yearly census intervals, any alteration of boundaries between the City or Borough and any disputes arising from the agreement. To date these provisions have not been administered despite large boundary changes during the local body amalgamations that were to follow in 1989.

¹ Wellington City Council managers have expressed interest in divesting out of the landfill JV asset and winding up this joint works component of the original agreement.

Greater Wellington was then engaged in 1985 to advise and produce an afforestation plan for the land that had been allocated for forestry works. The forest was subsequently planted in 1986 as the third major joint public works between Porirua and Tawa (a wastewater treatment plant had also been established as a joint venture works under the agreement).

Around the time of planting the forest, a 'gentleman's agreement' was struck between the two landowners Porirua and Tawa, and the Regional Council to implement the afforestation plan. The Regional Council was to undertake the set up, planting and management of the new forest in return for becoming a joint venture shareholder. This was despite initially advising against this type of forest management model because of the high value of the land.

There is no doubt that the intentions of the verbal arrangement at this time were in good faith between all parties but the finer details of the joint venture structure including revenue apportionment may have been ambiguous.

It wasn't until territory amalgamation loomed in late 1989 that the Regional Council initiated the first attempt at a formal agreement outlining their involvement, responsibilities and revenue apportionment. The 'Joint Forest Works Agreement' was the Regional Councils attempt to formally capture in contract what the three parties had informally discussed almost three years earlier when the forest was planted.

Under this retrospective agreement, all costs involved with operations and management over the life of the forest were to be carried by the Regional Council. An indicative cost for this has been provided; (appendix 2)

Shareholder	Expenses
Greater Wellington Regional Council	\$ 159,095
Porirua City Council (rates only)	\$ 0
Tawa Borough (rates only)	\$ 0

This capital outlay and financial risk was to be recognised by Greater Wellington's share of the revenue apportionment. The new revenue structure would see the Regional Council claiming 66% of the net forest revenue with the two landowners left to claim the remaining 34%. The 34% allocated to Tawa and Porirua would then be split by the population ratio as determined by the original agreement. Under the Joint Forest Works Agreement, the net revenue apportionments would now look like;

Shareholder	Revenue Apportionment
Greater Wellington Regional Council	66.029%
Porirua City Council	26.187%
Tawa Borough	7.784%
	100%

The agreement was not signed by Porirua or Tawa.

At a similar time, a 'Variation of Agreement' was drawn up by Porirua and Tawa to make amendments to the original 1983 agreement. This was signed by these two parties and in doing so acknowledged the Regional Councils Joint Forest Works Agreement. It is uncertain why the more formalised Joint Forest Works Agreement was not signed by the two landowners at this time.

Between 1991 and 1996 there were a number of forestry right and forest works agreements instigated by all three parties but the confusion around the 1989 agreement and change in governing body meant that none were signed in unison.

Also worth mentioning is the lack of provision in the agreements for any post harvest cleanup. At the completion of the logging, the Regional Councils involvement will cease, leaving the landowners with all cleanup responsibilities and costs.

As a result of local body re-organisation in 1989, Tawa Borough became part of Wellington City. This, in conjunction with territory boundary changes, meant that over 50% of the land included in the joint forestry project was now formally vested with Wellington City Council. This created major anomalies in the original land use agreement relating to the forestry project. The previous revenue apportionment agreement (which had remained unaltered) between Tawa and Porirua did not reflect the change in population ratio or change in forest land ownership.

The territory boundary change also meant that a major part of Porirua owned land under forest is now located within the Wellington City Council territorial boundary (appendix 3). The actual land covered in pine forest (net stocked area) on Wellington City Council land is 40.8 hectares with 32.1 hectares of pine forest covering Porirua City Council land.

When the Joint Refuse Disposal Works Agreement was established in 1983 the longer term management and use of Spicer forest was given scant consideration. This original agreement was essentially limited to the growing of a crop of pines as a low maintenance, revenue generating land use. The other values of the land were not ignored but their future long term significance for the land owners and wider community was not anticipated. A more holistic approach to the management and use of the forest has now become more apparent.

What are the present values of Spicer forest?

Spicer forest is relatively 'hidden' to the public. Only the eastern edge is visible from populated areas and the forest is not readily accessible. There are no formal access ways for the public with the northern entrance being obscured by commercial business leading up to the Spicer landfill. The Te Araroa Walkway passes through the forest; however this section is used infrequently. The values of the forest can be briefly summarized under the following headings:

Timber Values

A Cash Flow analysis has been conducted to provide the future net revenue of the forest when harvested in 2016. A registered forestry consultant has used a forest inventory carried out in 2002 to calculate the volume of logs likely to be recovered when the trees are harvested, provide an estimate of income from log sales and likely costs associated with the logging. The consultant was then able to estimate likely profit when the forest is harvested (appendix 4). The figures can also be discounted back to 2009 to provide a net value for the forest at present day (appendix 5).

Spicer Forest Predicted Log Revenue 2016:

Shareholder	Net Profit
Greater Wellington Regional Council	\$ 500,245
Porirua City Council	\$ 198,396
Wellington City Council	\$ 58,972
	\$ 757,615

Spicer Forest Net Present Value 2009:

Shareholder	NPV
Greater Wellington Regional Council	\$217,265
Porirua City Council	\$ 85,589
Wellington City Council	\$ 26,335
	\$ 329,190

Carbon Sequestration Values

Spicer forest was planted in 1986 and as such is not eligible for ongoing carbon credits under the Kyoto Protocol for carbon that is sequestered. However, because it is a Pre 1990 forest it will automatically be entered into the New Zealand Emissions Trading Scheme² (Forestry). This has implications for the future land use of the forest.

Pre 1990 forest owners will be liable for the carbon lost when a forest is harvested and not replanted. In effect, this land use change is considered a carbon emission under the Emissions Trading Scheme. A 30 year old Radiata Pine forest which has been pruned and thinned contains approximately 750 tonnes of carbon per hectare. This would have to be repaid if deforestation occurred. The financial liability for the forest owners in not reforesting the Spicer forest land area will be approximately;

	Net stocked area	CO2 emission @750t/ha	Financial liability @ \$30/t
Porirua City Council	32.1 (ha)	24,075 (t)	\$722,250
Wellington City Council	40.8 (ha)	30,600 (t)	\$918,000
			\$1,640,250

² The ETS in its current form is to be reviewed at select committee with possible amendments due before Sept 09.

To compensate Pre 1990 forest owners who are penalised under this scheme the government is offering an incentive of 60 credits³ per hectare (New Zealand Units or NZUs) to persuade forest owners to retain their land in forest or a woody vegetation cover. 60 NZUs will be allocated (if applied for) per hectare of land covered in forest. These units can be sold on the carbon trading market with an anticipated price of \$30 per NZU. If Spicer forest is harvested and the land replanted or left to revert back to indigenous vegetation cover in perpetuity there will be no obligation to pay these units back. Should the Council(s) decide to sell the units, the expected one off return would be;

	Net stocked area	@ 60 NZUs per hectare	Financial return @ \$30/NZU
Porirua City Council	32.1 (ha)	1,926 (NZUs)	\$57,780
Wellington City Council	40.8 (ha)	2,448 (NZUs)	\$73,440
			\$131,220

The possible sale of NZUs has not been factored into revenue calculations.

Although the vegetation post logging will not be eligible for carbon credits, it will still have a carbon sequestration value which could be used to offset against corporate emissions. Landcare Research estimate that regenerating indigenous vegetation around the Wellington region is sequestering approximately three tonnes of carbon dioxide per hectare per year (3t/CO₂e/ha/yr), while faster growing exotic species such as pine could be sequestering approximately 25t/CO₂e/ha/yr. This would provide corporate carbon emissions offsetting to the annual amount of;

	Net stocked area	Exotic sequestration @25t/CO ₂ e/ha/yr	Native sequestration @ 3t/CO ₂ e/ha/yr
Porirua City Council	32.1 (ha)	802.5t/CO ₂ e/yr	96.3t/CO ₂ e/yr
Wellington City Council	40.8 (ha)	1020t/CO ₂ e/yr	122.4t/CO ₂ e/yr
		1822.5t/CO₂e/yr	218.7t/CO₂e/yr

Soil and Water Values

The present forest cover provides soil stability in severe weather events, especially on the steeper western slopes. The closed canopy forest being located in the upper catchment of the Ohariu Valley stream will be providing rain interception during small to medium size storm events thus reducing the amount of water runoff and potential downstream flood peaks. The quality of the water leaving the forested areas has also been enhanced. The root networks of trees growing along the Ohariu stream edge within the forest helps to do this by reinforcing stream banks and reducing stream bank erosion. The plantation replaced previously open and exposed pasture of which steeper areas were subject to sheet erosion prior to the forest being planted.

³ As part of the ETS, a Draft Forestry Allocation Plan is currently being publicly consulted to provide feedback on the allocation amount of free NZUs to pre 1990 forest owners.

Ecological Values

Shade and shelter has created conditions for new species of plants and animals to colonise the area. Pines tend to shade out weeds such as gorse and broom and conditions have been created for native species to naturally colonise plantation edges as well as areas within the forest where tree densities are lower and sufficient light penetrates to the forest floor.



As a result of the shade and shelter created, and the removal of grazing stock and possum control, Spicer forest and the Forest of Tane have provided conditions where native vegetation has been able to re-establish over considerable areas. Pockets of vegetation including mahoe and five-finger exist within the current pine forests. With this enhanced plant diversity, bird life has increased dramatically to become a positive feature for the Tawa community. Native bird counts in the nearby Redwood bush indicate increasing numbers of fantail, grey warbler, kingfisher and bellbirds. With harvesting of the pine forest, some damage to these pockets and disruption to the localised ecology can be expected.

Landscape and Amenity Values

The eastern edge of Wellington City is defined by the upper slopes and skyline of the containing hills, managed as a coherent and continuous area of public open space by Wellington City Council as 'Wellington's Outer Green Belt'. Spicer forest makes a significant contribution to the character and interest of its northern section. Of particular note:

- The forest provides a backdrop to Tawa and contributes to the high amenity values of the urban edge. Groups of various exotic trees additional to pines add visual interest along the forest margins and the dense regeneration of natives softens the lower faces of the hill.
- The forest provides a backdrop to the Porirua Landfill. The scale of the pines reduces the impact of the landfill and provides enclosure, and shelter. The plantation softens the adverse impacts of the landfill along its western side, contributing to coherence in the patterns of vegetation along the face of the hill. On the eastern side of the landfill pines also provide containment, but less effectively.
- Although plantation edges along the main ridge track are dominated by pines there are groups of cypresses and eucalypts, with pockets of natives. There are views from the ridge out to Tawa and to open farmed ridges to the west, as well as to Porirua Harbour in the north. Within the wider context of the Outer Green Belt the forest provides a unique experience; almost all of the outer green belt has open pasture along the ridges with indigenous vegetation regenerating on the eastern slopes above the city and open farmland to the west. The forest provides an experience of shelter and enclosure in contrast to the open and exposed landscape along the remainder of the Outer Green Belt's main ridgelines.

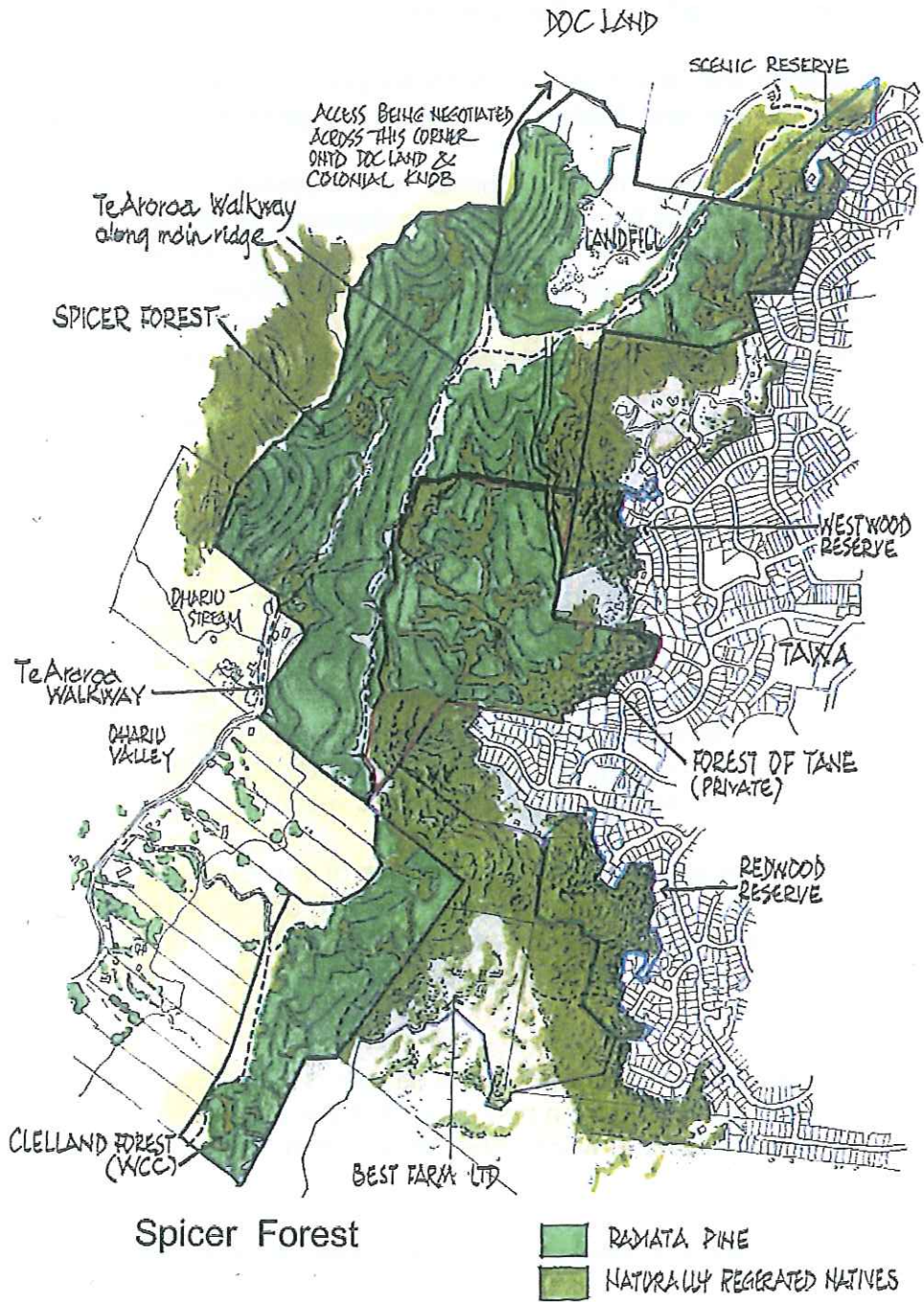
- Seen within the wider landscape of northern Wellington and Porirua, Spicer forest makes an invaluable contribution to the continuum of woody vegetation across the eastern hills above the city and along the lower slopes of Colonial Knob. From SH 1 and the urban environment the coherence and continuity of vegetation along the western hills is visually important and a defining feature of this landscape's distinctive character.

Recreation Values

Access to Spicer forest is currently limited to that provided by a rough track starting from an obscure entrance off the road to the Landfill. There are no signs and there is a locked gate. Public use would appear to be limited to occasional horse riders and walkers. The 'track' along the ridge, formed to provide access for forest establishment and management, has not been maintained and is partly overgrown. The Te Araroa Walkway passes through the forest, entering at the southern end of the forest (from the northern end of Ohariu Valley Road) and moving up to the main ridge. The walkway leaves the main ridge of the forest in the north to link up with tracks on Colonial Knob.

Spicer forest could accommodate a wide range of activities. The forest forms the backdrop to Tawa and is readily accessible from Porirua City. The area could become a destination for a range of outdoor activities including mountain biking, walking, horse riding, jogging, as well as more passive activities such as picnicking. There is a sufficient area to accommodate all of these activities without undue conflict. It is recommended that Porirua and Wellington City Councils undertake a joint recreation study to identify recreational needs and opportunities for this area. The findings from a recreation study could help determine the ideal forest management scenario.





Spicer Forest

Map 1- Existing cover

Future management options

There are a range of possible options for the future management of the forest and the land. In broad outline they amount to four:

1. Clearfell the pine forest in 2016 as per the original agreement and manage the land back into either an indigenous or exotic vegetation cover.
2. Staged logging of the forest over several decades gradually transitioning the land back into an indigenous vegetation cover.
3. Retain the pine forest and manage for longevity, developing recreation opportunities and managing for multiple use values.
4. Retain part of the forest and manage in perpetuity while logging the remainder of the trees in stages over several decades.

Before exploring these options further there are a number of influencing factors which must be considered.

- Most of Spicer forest is contained within the Wellington City Council Outer Green Belt concept area with WCC land subject to the Outer Green Belt Management Plan. This states the objective for the area – Sector 1, is *“To cease plantation forestry on Wellington City Council owned lands after the next harvest.”* The plan does acknowledge *“the community may value the open forest landscape that the pines provide.”* There is also a requirement for WCC to *“indicate to Greater Wellington Regional Council the desire to avoid replanting following the harvest of the current plantation and declare an intention to classify the area as a scenic reserve.”*
- It has been generally agreed that a cover of woody vegetation should be sustained in the long term regardless of which option is chosen (accepting that there might be a periodic removal of trees for profit). This is because the area has ecological value and because soil stability and water quality are important.
- The western slope above the Ohariu stream is classified as erosion prone under the Regional Soil Plan and as such there is a requirement to actively re-establish this area in woody vegetation within 18 months of any logging operation.
- The forest being Pre 1990 will be automatically entered into the Emissions Trading Scheme. An emissions ‘tax’ will apply to forests planted before 1990 which are removed and the land subsequently kept free of woody vegetation.
- Although the land is not Kyoto compliant and not eligible for ongoing carbon credits, the carbon sequestered by any future vegetation cover can be used to offset against corporate carbon emissions. Different vegetation types have varying carbon sequestration capability.
- Regardless of how the vegetation is managed, the Spicer forest land will become increasingly important for recreation. Porirua City is lacking parks

of a scale adequate to accommodate activities such as mountain biking and the area has the potential to become an integral part of Wellington City's Northern Reserves Framework. Within this framework the forest land could provide for recreational activities not currently possible in the northern part of the city. A key consideration in exploring future options must be the role of vegetation in providing diverse and high quality environments for recreational experiences.

- Depending on the forest management outcomes outlined above, a joint management model could be developed between Porirua and Wellington City for the ongoing management of the forest and recreational pursuits.
- The neighbouring Forest of Tane on the eastern slope is due for logging around the same time as Spicer. It is anticipated that the logs from this forest will be extracted from the top of the forest out along the Spicer ridgeline to Broken Hill road. A subdivision is possible for the Forest of Tane land once the trees have been removed.
- Meridian Energy has been granted resource consent for the construction of a wind farm at Mill Creek, west of Wellington. Conditional access through Spicer Forest to build the wind farm has been granted by both Porirua and Wellington City Councils. This will involve the construction of a private link road between Broken Hill road, through the forest, exiting into Ohariu Valley road. For the most part the road would follow the existing track along the ridge. This would have had to have been upgraded for logging trucks regardless of whether the wind farm was built. As part of the access agreement with both Councils, Meridian has agreed to make a financial contribution to the recreational infrastructure within the forest in the form of new walk tracks.

From the above it becomes clear that retaining a cover of woody vegetation is desirable from all perspectives and that a stable and diverse cover would be preferable from a recreational perspective.

A discussion of each of the four options follows with more detailed cost and revenue analysis provided in appendix 6 and 7.

1a. Clearfell the forest in 2016⁴ and manage the land back into indigenous vegetation.

With some market flexibility, clear felling the entire forest is scheduled for 2016. The reversion of the WCC land back into native vegetation is the desired objective outlined under the Wellington City Council Outer Green Belt Management Plan. The PCC land occupying the western slope of the forest is considered erosion prone under the Regional Soil Plan i.e. is over 28 degrees, and therefore will be required to be replanted in a woody vegetation cover within 18 months of logging.

In fulfilling the agreement to realise the timber value of the forest, the recreational and ecological values of Wellington and Porirua land will be adversely affected. It is intended under this option to retain 10ha of pines around the landfill to act as a visual buffer.



Retain pines around landfill

The advantage of following through with this option is that it fulfils the original joint works agreement and provides the three parties with revenue as intended under the latter agreements. The logging infrastructure including new road, tracks and skidsites will be available for ongoing vegetation management and recreational pursuits. Over a greater length of time, the ecological value will increase as the indigenous vegetation becomes established. The carbon sequestered by regenerating scrub/native bush will be approximately 3t/CO₂e/ha/yr and this could be used to offset corporate carbon emissions.

The disadvantage of clear felling the forest would be the immediate adverse impact this option would impose on the environmental, ecological and recreational values of the land for a considerable period of time. These effects would include;

- the reduction in soil and water quality within the Ohariu and Porirua stream catchments including increased water runoff and sediment discharge.
- the loss of ecological and landscape value caused by the sudden loss in vegetation cover. There would be a loss of stable habitat for birds and inevitable damage to indigenous regrowth in gullies and along stand edges. The visual disruption, especially on the eastern slope above Tawa will be pronounced.
- recreational opportunities will be significantly reduced with the loss of the vegetation cover.

The clear felling would see most of the trees on the steeper Porirua land 'hauled' across the Ohariu stream in a cable logging operation. This will invariably lead to some damage to the habitat in what is a sensitive area. It will also mean a much higher proportion of log waste material will be left on

⁴ Logging would occur as one continuous operation over a 6 month period. Any native replanting would occur the first winter after logging to take advantage of ground scarification and to establish trees quickly before weeds such as gorse and broom invaded the site.

WCC land incurring a higher cost to clean up. There are no post harvest arrangements between the landowners for this type of work. If pines are to be retained as a buffer around the landfill, these will over time, becoming an increasing windthrow risk.

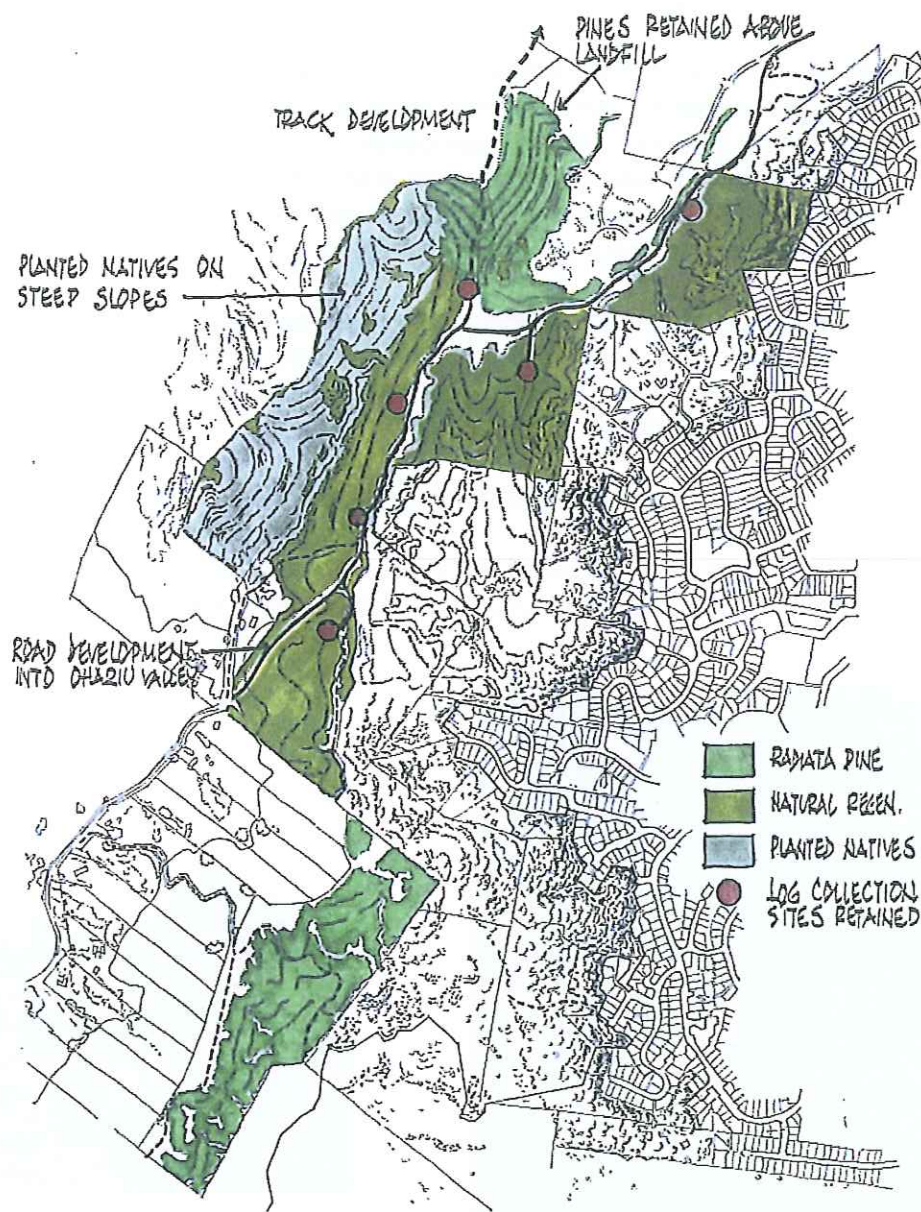
Because the total land area involved, over 70ha, is too large and costly for a full indigenous replanting programme, most of the site (37.9 ha) would be left to revert back through natural succession and regeneration processes. Indigenous reversion will take three to four decades to achieve. An early coloniser, most probably gorse, will dominate the land and landscape and pose a high fire risk in the short to medium term.

If it is intended to return the steeper western slope back into native vegetation, this will need to be achieved through replanting as required under the Regional Soil Plan. The planting programme will require a huge financial investment which will fall with PCC.

The financial return forecast to both Porirua and Wellington City Councils will be insignificant compared to first year post logging costs for each landowner. Further significant post logging costs and resources will be required in the immediate out years for replanting, weed control and maintenance of the site.



Example of logged forest area and skid site



Spicer Forest

Map 1a - Clearfell the forest in 2015/16 and manage the land back into indigenous vegetation

1b. Clearfell the forest in 2015/16 and replant with exotic species.

Clear felling the entire forest is scheduled for 2016 under the current arrangements. Despite WCC's Outer Green Belt Management Plan advising against continuing production forestry in this area, there are a number of advantages to planting a second rotation exotic crop, some of which have only become apparent since the Outer Green Belt plan was written in 2004.

The main advantage of this option would be the relatively low cost and quick re-establishment of a vegetation cover over the land. Faster growing species such as pine or eucalyptus would quickly mitigate the adverse effects of harvesting while a higher value, longer rotation crop such as Douglas Fir would be most suitable on the steeper western slopes. The non commercial values such as soil and water quality; landscape and recreational opportunities could be restored within a shorter period of time.

The future tree crop could be jointly managed by WCC and PCC for commercial value and a more equitable revenue allocation could be expected at rotation end between the two landowners. During this rotation, which could be extended out to 50 - 60 years, the forest could incorporate a wide range of recreational opportunities.

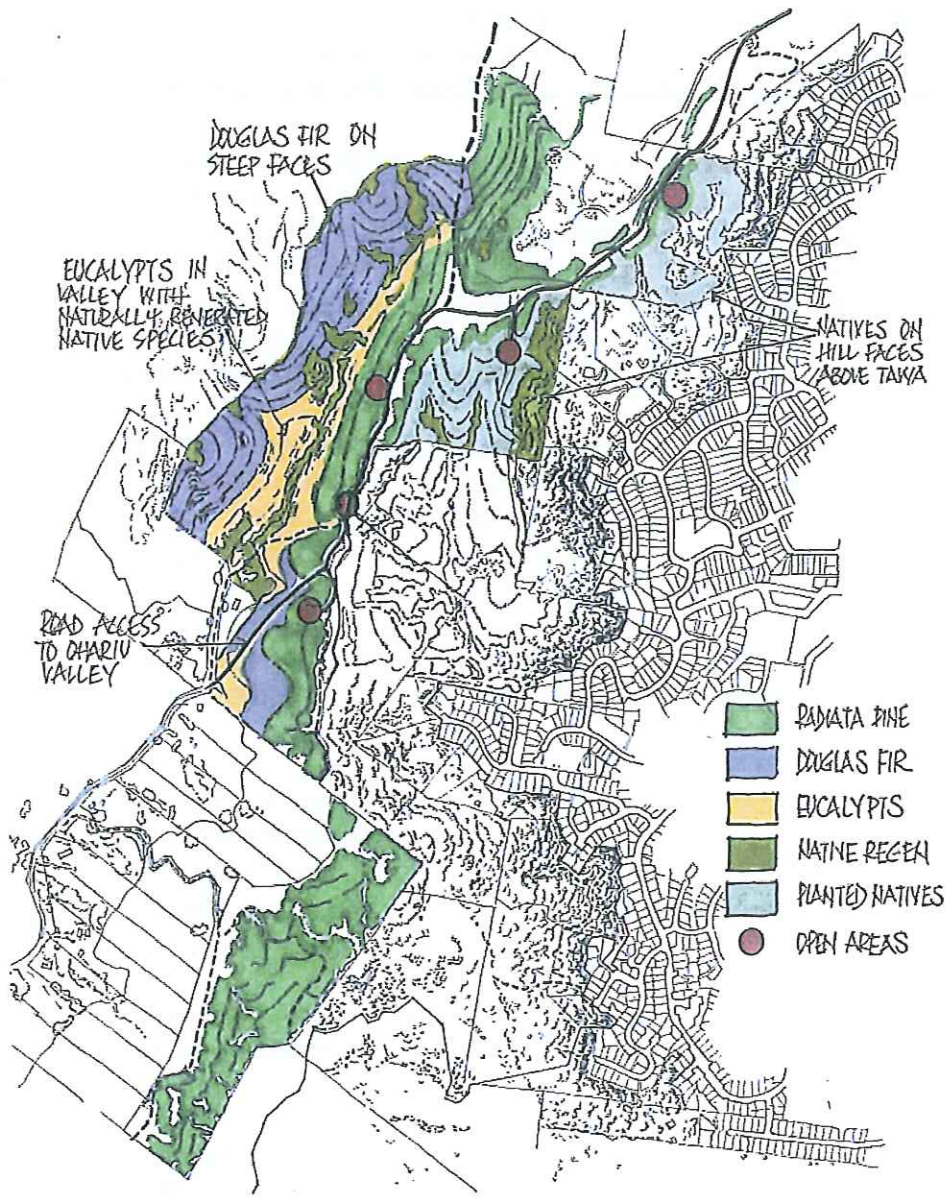
The roads, tracks and skid sites developed for the initial harvesting of the forest could form the recreational infrastructure required to promote multiple use in the future.

For WCC, post logging costs and costs associated with the new exotic forest regime over a 12 year period will exceed the anticipated revenue at harvest by over \$150k. Porirua's balance is much more favourable with anticipated harvest revenue exceeding post logging and future management cost by over \$50k.

The carbon sequestered by a radiata pine block would be approximately 25t/CO₂e/ha/yr which could be used as a corporate emissions offset.

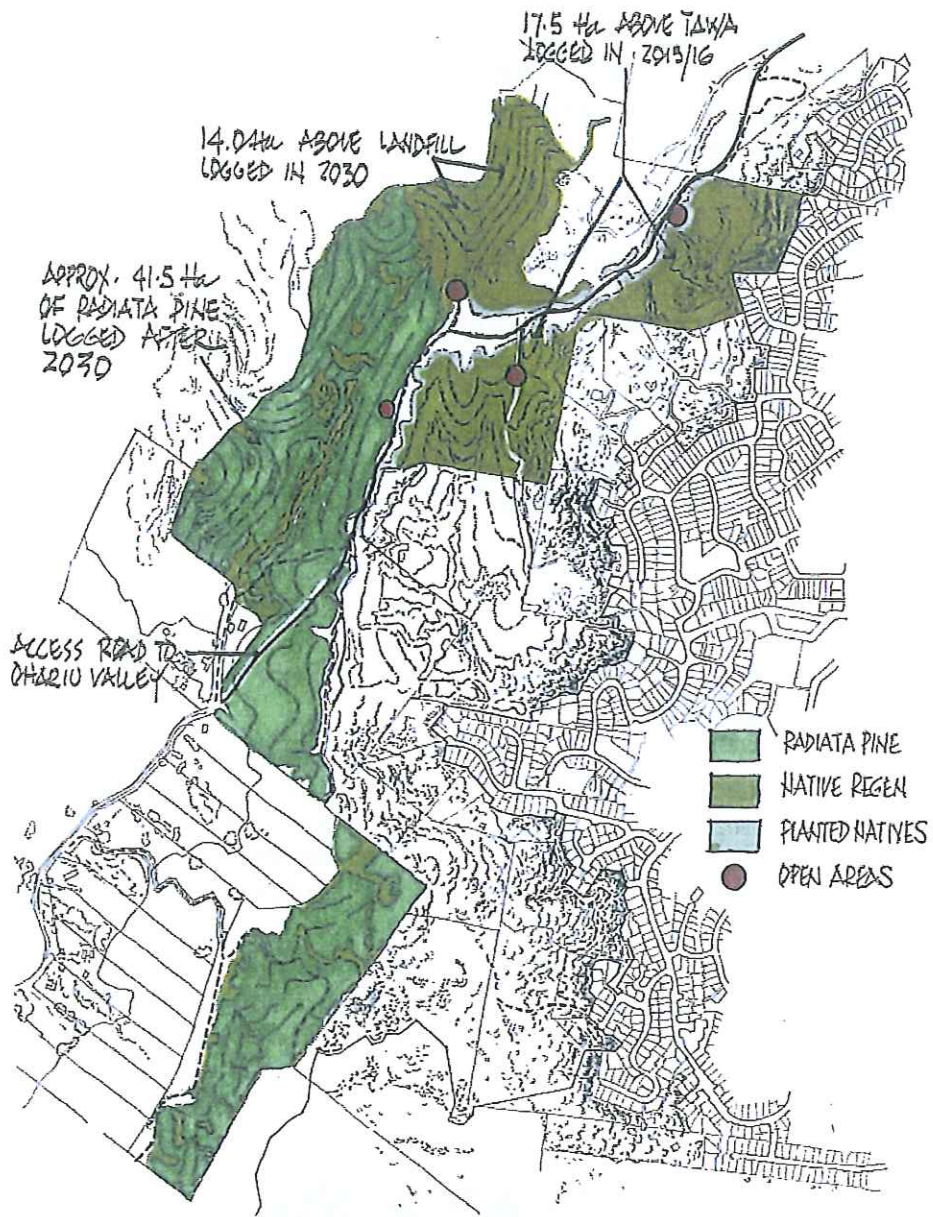
The disadvantages of this option include those adverse effects of clearfelling already mentioned. The replanting of a second rotation tree crop would be against Wellington City Council policy as outlined in the Outer Green Belt Management Plan and a review of this plan would have to be undertaken. There would also be risks and costs involved with the ongoing management of a commercial forest block.

While the majority of the harvested forest area would be replanted with an exotic crop species, it would still be advised to replant the eastern slope above Tawa with native plants or leave to revert back to native vegetation. The objective of this being to minimise the urban and exotic forest interface which could pose a future hazardous tree risk as the exotic forest matures.



Spicer Forest

Map 1b- Clearfell the forest in 2015/16 and replant with exotic species



Spicer Forest

Map 2- Staged Logging of the Forest.

3. Manage the existing forest without any logging.

Under this option the entire forest would be retained and managed for its multiple use values similar to Wellington City Councils Inner Town Belt. However, there would inevitably be a need for tree management as the trees age, posing risks to recreational users. There would also be pines along the eastern edge of the forest that have the potential to shade houses and become a hazard and some tree removal would be required to retain views out from the forest.

The advantage of this option is the retention of all the non commercial values the forest provides including soil stability, amenity and landscape qualities. There will be increasing pressures to recreate in this area from Wellingtons northern suburbs and Porirua, and the retention of the pine forest will offer an alternative landscape for recreational opportunities that cannot be found elsewhere on the Outer Green Belt. It is only advised to retain the forest if it is to be promoted as a recreational hub. PCC and WCC could undertake joint management of the forest under a new agreement and manage the land and forest for its multiple use values.

The main disadvantage of this option is forgoing the timber value that harvesting of the forest would have provided. The joint venture would have to be absolved and an arrangement made with the Regional Council regarding their investment in the forest.

The track network developed for logging would not be subsequently available for recreation and this infrastructure would have to be developed by Wellington and Porirua City Councils if the forests recreation potential is to be realised. The Meridian Energy contribution could be used for this.

The management of pine trees to enhance visual amenity and recreation values would require the ongoing allocation of funds. As the trees age past maturity, there would be a long term risk of the forest suffering increasing amounts of wind damage and this would have to be addressed at some stage.



Forest recreation

4. Staged logging of part of the forest while retaining the steeper western slope in pine trees in perpetuity.

A more holistic forest management approach would be the combination of management techniques mentioned in options 2 and 3 above – staged logging of half of the forest over a period of time whilst retaining the steeper western slope in pine trees in perpetuity.

17.5 ha of forest would be logged above Tawa in 2016. Staged logging of a further 37ha could occur over a number of decades gradually transitioning the land back into an indigenous cover through revegetation planting and natural reversion.

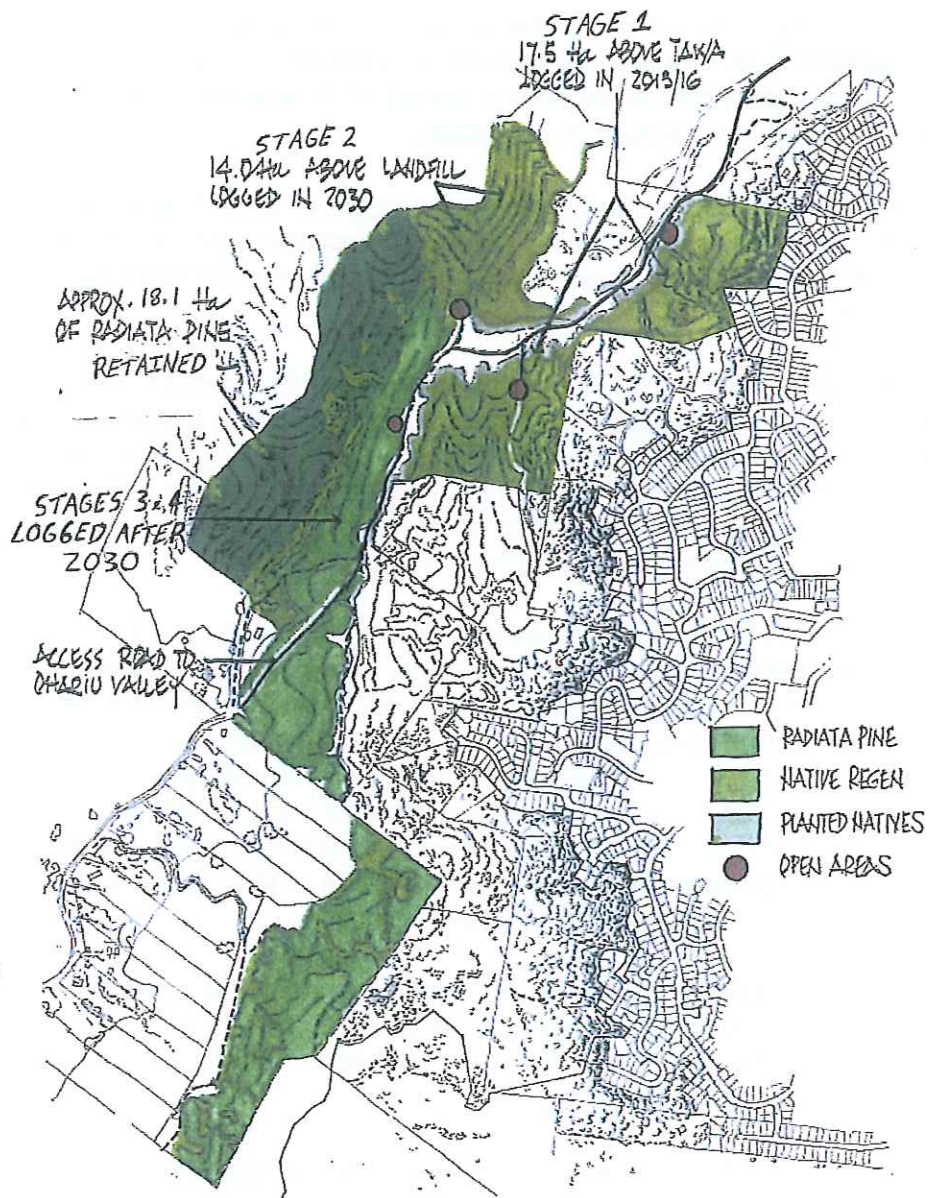
The forested area on PCC land, approximately 18ha, would not be clear felled. A thin to waste operation could be completed on this slope now to reduce the stems per ha to a low number – 300. This will have the effect of allowing more light onto the forest floor promoting native forest regeneration. Over time, as the remaining pines succumb to windthrow, the indigenous forest cover will become the dominant vegetation cover.

The main advantage of this scenario is to eliminate the costly requirement to log and replant the steeper western slope. The trees on this slope are of the lowest value in the forest yet the logging cost would be the highest because of the difficulty in access. Replanting this slope with natives would be extremely expensive and this would be avoided as the increased light levels on the forest floor would allow natural regeneration to occur. Retaining the trees on this slope would also significantly mitigate environmental issues that may result from logging including increased siltation of the Ohariu stream and potential erosion from loss of a vegetative cover.

The main disadvantage would be forgoing any revenue associated with the pines on this slope – the forgone revenue is anticipated at \$118k. The pine thinning's on the ground would, in the short term, restrict recreational use and pose an increased fire risk.

There will be potential for windthrow as the remaining trees on this slope age although this would probably occur on a gradual basis and achieve the same result as the thinning operations – letting natives regenerate.

Because both PCC and WCC are intrinsically linked to the land through the land boundary anomaly, and through both parties recreational interest in the area then a joint management approach would need to be considered. This would require Greater Wellingtons exit out of the JV agreement so that the forest can be managed more holistically by the landowners.



Spicer Forest

Map 4 – Staged Logging, Retain Part Forest in Perpetuity

The financial Implications of the options

The likely returns from timber harvested under the various options can be calculated using the Allan Bell assessment (adjusted to account for log price changes since 2005) and allowing for likely roading and harvesting costs (roading costs have been factored in despite the possibility that Meridian Energy may construct the main access road into the forest.)

All four options put forward result in the retention of a woody vegetation cover and therefore meet the requirements under the Emissions Trading Schemes Pre 1990 Forest criteria. Because the land is to be kept in a perpetual forest cover (irrespective of whether it is exotic or indigenous) then the units could be sold without the obligation to repay back. Should the land use change at any point back into a non forest cover the units would have to be repaid. The possible sale of NZUs has not been factored into the financial calculations.

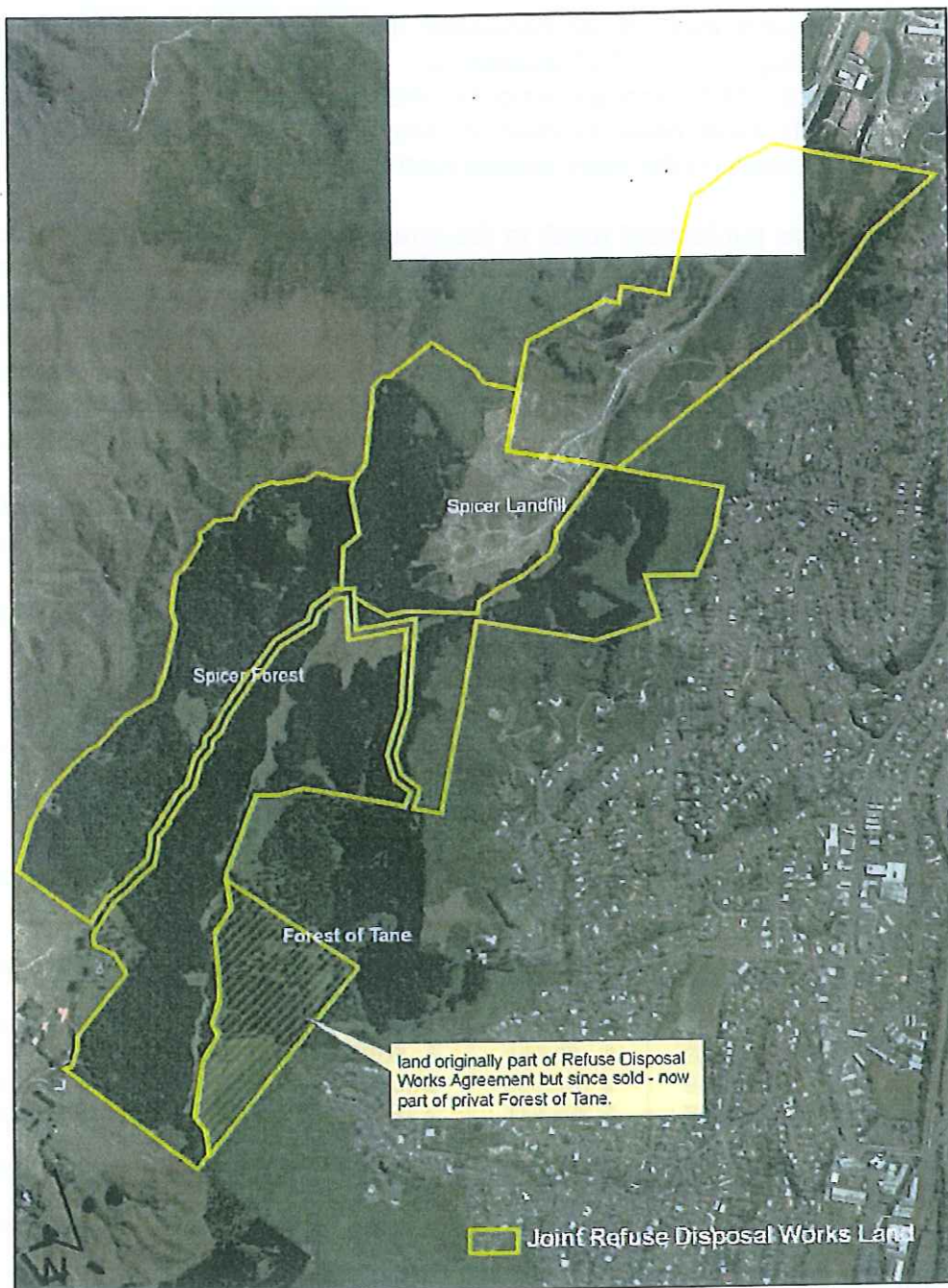
The post logging costs for options 1, 2 and 4 have been identified and include rehabilitative measures, weed control and replanting. Estimates of these costs have been obtained from the Regional Council, NZForestWorks Ltd and Berhampore Nursery. A full analysis of the predicted revenue and post logging costs have been provided in appendix 6 - 7.

Financial Summary Table -

Option	Net Log Revenue	Shareholder Revenue			Post Logging Costs	
		GWRC	WCC	PCC	WCC	PCC
1a. Clearfell forest and replant in native / leave to regenerate (retain 10ha of pines around landfill)*.	\$ 660,320	\$ 500,245	\$36,673	\$ 123,399	\$ 294,280	\$ 777,735
1b. Clearfell forest in 2016 and replant in exotics*.	\$ 757,615	\$ 500,245	\$58,972	\$ 198,396	\$ 214,073	\$ 143,007
2. Staged Clear-felling **						
2016 Stage 1	\$ 191,362	\$ 126,354	\$ 14,895	\$ 50,112	\$ 198,125	
2030 Stage 2	\$ 116,688	\$ 77,048	\$ 9,083	\$ 30,557		\$ 599,000
2040 Stage 3	\$ 198,349	\$ 130,966	\$ 15,439	\$ 51,941	\$ 137,100	\$ 694,250
2050 Stage 4	\$ 251,216	\$ 165,877	\$ 19,555	\$ 65,786	\$ 146,055	\$ 133,580
	\$ 757,615	\$ 500,245	\$ 58,972	\$ 198,396	\$ 481,280	\$ 1,426,830
3. Retain Existing Forest***	\$ 0	\$ 0	\$ 0	\$ 0	\$ 107,000	\$ 107,000
4. Staged Clear-felling, ***						
Retain part forest in perpetuity						
2016 Stage 1	\$165,112		\$165,112		\$198,125	
2030 Stage 2	\$ 98,564		\$ 98,564			\$599,000
2040 Stage 3	\$144,168		\$144,168		\$149,000	\$ 10,000
2050 Stage 4	\$126,946		\$126,946		\$163,555	\$ 10,000
	\$ 534,790	\$ 0	\$ 267,395	\$267,395	\$510,680	\$619,000

*within confines of current agreement **staged harvest requires GW approval ***requires GWs exit from JV

Appendix 1: Original Land Works Agreement Area



DATA STATEMENT
 Property boundaries
 Land Information NZ
 2018/10/20/2018
 2018/10/20/2018
 2018/10/20/2018
 2018/10/20/2018

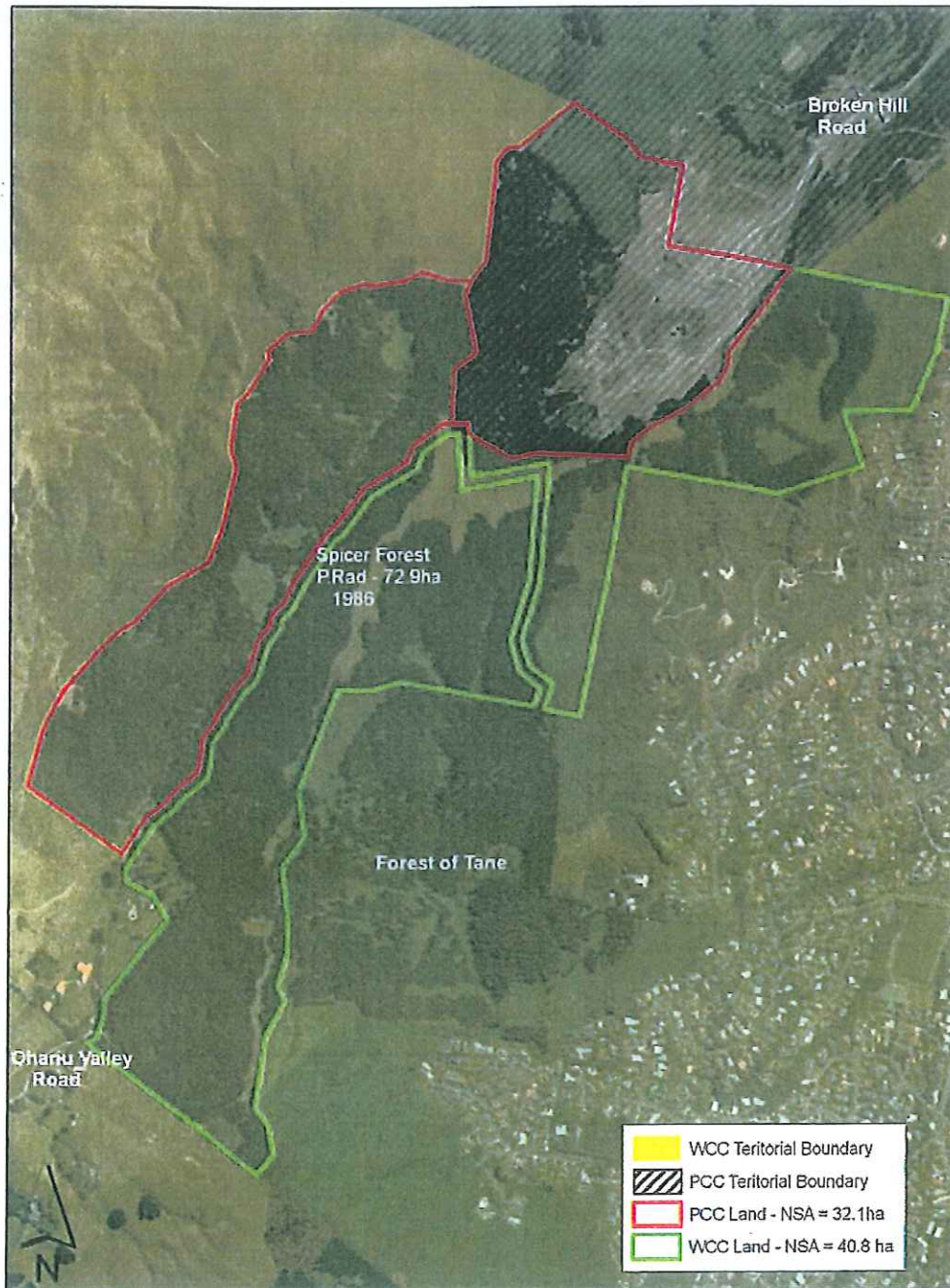
Land Set Aside Under Agreement
 Relating To Joint Refuse Disposal Works



Appendix 2: Spicer Forest Indicative Costs to Date

\\CIVIC\Groups\SPARKS NEW G DRIVE\ANNUAL PLAN PROJE					\$159,095	\$383,395
72.0	Direct Costs	Total	Admin WRC	Admin PCC	Historic Costs	Compounded to 2009
Year	WRC	PCC	\$30	\$0	Spent to 2009	5%
1986	\$45,700		\$2,160	\$0	\$47,860	\$147,003
1987			\$2,160	\$0	\$2,160	\$6,319
1988			\$2,160	\$0	\$2,160	\$6,018
1989			\$2,160	\$0	\$2,160	\$5,731
1990			\$2,160	\$0	\$2,160	\$5,458
1991	\$25,480		\$2,160	\$0	\$27,640	\$66,519
1992			\$2,160	\$0	\$2,160	\$4,951
1993	\$27,040		\$2,160	\$0	\$29,200	\$63,740
1994			\$2,160	\$0	\$2,160	\$4,490
1995	\$23,075		\$2,160	\$0	\$25,235	\$49,964
1996			\$2,160	\$0	\$2,160	\$4,073
1997			\$1,080	\$0	\$1,080	\$1,940
1998			\$1,080	\$0	\$1,080	\$1,847
1999			\$1,080	\$0	\$1,080	\$1,759
2000			\$1,080	\$0	\$1,080	\$1,675
2001			\$1,080	\$0	\$1,080	\$1,596
2002			\$1,080	\$0	\$1,080	\$1,520
2003			\$1,080	\$0	\$1,080	\$1,447
2004			\$1,080	\$0	\$1,080	\$1,378
2005			\$1,080	\$0	\$1,080	\$1,313
2006			\$1,080	\$0	\$1,080	\$1,250
2007			\$1,080	\$0	\$1,080	\$1,191
2008			\$1,080	\$0	\$1,080	\$1,134
2009			\$1,080	\$0	\$1,080	\$1,080

Appendix 3: Territory Boundaries and Land Ownership



Data Statement

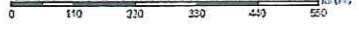
Property boundaries
 based on aerial photos
 taken in 2008. Accuracy
 is not guaranteed. No
 liability is accepted for
 any errors or omissions.

Other digital data
 was used to create
 this map. Accuracy
 is not guaranteed. No
 liability is accepted for
 any errors or omissions.

Map prepared by
 WCC Mapping Unit
 August 2008

Spicer Forest Land Administration

1:9,102



Appendix 4: Predicted Log Yield, Log Revenue and Logging Costs 2016

Predicted Log Yield and Revenue Analysis

Log Grade	P1	P2	\$	K	Domestic	Pulp	Total
Yield (t)	2,264	2,810	4,628	9,206	5,224	10,741	34,873 tonnes'
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00	
Revenue	\$271,680.00	\$266,950.00	\$393,380.00	\$672,038.00	\$313,440.00	\$322,230.00	\$2,239,718.00

Note: Yield values from Allan Bell valuation 2005
Log Price's as of October 2008

Predicted Logging Cost and Revenue Analysis

Volume	34,873 tonnes
Total Revenue	\$2,239,718.00
Logging Costs	\$30.50/t \$1,063,626.50
*Roading Costs	\$3.00/t \$ 104,619.00
Cartage	\$9.00/t \$ 313,857.00
Total Costs	\$42.50/t \$1,482,102.50
Net Revenue	\$757,615.50

* Roading costs would be significantly lower with the construction of the main access road by Meridian.

Appendix 5: Net Present Value 2009

WCVIC&RGroups\PARKS NEW G DRIVE\ANNUAL PLAN PROJECTS\Hazardous trees removal_A008\Urban Forest Mgmt Planning\Commercial forests\Spicer Forest\Discussion Document Jan 09\Spicer										
Forest	Spicer Preliminary		Valuation Of Tree Crop with no land rental							
Discount Rate	10.0%		Backup CD	Bak5\WRC3					For Sensitivity Analysis	% Change
Compound Rate	5.0%		Indirect Costs	0.0%					Delivered Price Change	0.0%
Reason For Valuation	Market Value of Tree Crop		Compound Costs Used?	N					Logging Cost Change	0.0%
Date Of Valuation	30 June 2009		Felling at age 28 (2014)						Cartage Cost Change	0.0%
Year	2009		Valuation Status:		DRAFT					
Annual Overheads	\$65.00	\$/ha/year							Temp Roads Change	0.0%
Land Rental Cost	n/a	\$/ha/year	66.0%	\$217,265	Greater Wellington					
Total Stocked Area	72.9		26.0%	\$65,589	Porirua City Council					
Total Forest Value	\$329,190	NPV	8.0%	\$26,335	Wellington City Council					
Forest Value \$/ha	\$4,516		100.0%	\$329,190						
Tax Regime	Cashflows are Pre-Tax									
Stand / Block	Species	Nsa (ha)	Avg Age	\$Value	EstabYr	TRV m3/ha	\$Value/ha	Stumpage \$/ha	CF Age	
Spicer 01	P. radiata	21.0	23.0	\$93,829	1986	519	\$4,468	\$7,697	28.0	
Spicer 02	P. radiata	22.1	23.0	\$165,313	1986	571	\$7,480	\$12,548	28.0	
Spicer 03	P. radiata	27.1	23.0	\$64,285	1986	419	\$2,372	\$4,322	28.0	
Spicer 04	P. radiata	1.5	23.0	\$3,977	1986	350	\$2,651	\$4,772	28.0	
Spicer 05	P. radiata	1.2	23.0	\$1,786	1986	350	\$1,489	\$2,899	28.0	
Spicer	P. radiata	0.0	n/a	\$0	1986	0	n/a	\$0	28.0	

Appendix 6: Predicted Stakeholder Revenue

Option	Log Revenue	GWRC	WCC	PCC
1a. Clearfell forest in 2016 (retain 10ha of pines around landfill)*.	\$ 660,320	\$ 500,245	\$ 36,673	\$ 123,399
1b. Clearfell forest in 2016*.	\$ 757,615	\$ 500,245	\$ 58,972	\$ 198,396
2. Staged Clear-felling **				
2016 Stage 1	\$ 191,362	\$ 126,354	\$ 14,895	\$ 50,112
2030 Stage 2	\$ 116,688	\$ 77,048	\$ 9,083	\$ 30,557
2040 Stage 3	\$ 198,349	\$ 130,966	\$ 15,439	\$ 51,941
2050 Stage 4	\$ 251,216	\$ 165,877	\$ 19,555	\$ 65,786
	\$ 757,615	\$ 500,245	\$ 58,972	\$ 198,396
3. Retain Existing Forest NZUs***	\$ 0	\$ 0	\$ 0	\$ 0
4. Staged Clear-felling, 18.1ha of forest retained***				
2016 Stage 1	\$165,112	\$ -	\$165,112	
2030 Stage 2	\$ 98,564	\$ -	\$ 98,564	
2040 Stage 3	\$144,168	\$ -	\$144,168	
2050 Stage 4	\$126,946	\$ -	\$126,946	
	\$ 534,790	\$ -	\$267,395	\$267,395

* within confines of current agreement **staged harvest requires GW approval ***requires GWs exit from JV

Option 1a Total projected revenue is \$757,615
Retaining 10ha of pines will give actual revenue of \$660,320

GWRC receives 66.029 % of total projected revenue = \$500,245
Remaining revenue = \$660,320 - \$500,245 = \$160,075

PCC receives 77.089% of remaining revenue = \$123,399.

WCC receives 22.910% of remaining revenue = \$36,673.

Option 1b Total projected revenue is \$757,615

GWRC receives 66.029 % of total projected revenue = \$500,245
Remaining revenue = \$257,370

PCC receives 77.089% of remaining revenue = \$198,396.

WCC receives 22.910% of remaining revenue = \$58,972

Option 2

Stage 1 Clear felling 17.5ha of pines on eastern slope will give actual revenue of \$191,362

GWRC receives 66.029% of actual revenue = \$126,354.

PCC receives 77.089% of remaining revenue = \$50,112

WCC receives 22.910% of remaining revenue = \$14,895.

Stage 2 Clear felling 14ha of pines will give actual revenue of \$116,688

GWRC receives 66.029% of actual revenue = \$77,048.

PCC receives 77.089% of remaining revenue = \$30,557

WCC receives 22.910% of remaining revenue = \$9,083.

Stage 3 Clear felling 21ha of pines will give actual revenue of \$198,349

GWRC receives 66.029% of actual revenue = \$130,966.

PCC receives 77.089% of remaining revenue = \$51,941

WCC receives 22.910% of remaining revenue = \$15,439.

Stage 4 Clear felling 20.4ha of pines will give actual revenue of \$251,216

GWRC receives 66.029% of actual revenue = \$165,877.

PCC receives 77.089% of remaining revenue = \$65,786

WCC receives 22.910% of remaining revenue = \$19,555.

Option 3 Total projected revenue is \$757,615
Actual revenue from log harvest is \$0

Option 4

Stage 1 Clear felling 17.5ha of pines on eastern slope will give actual revenue of \$165,112
New revenue apportionments to be decided between PCC and WCC. At this stage the revenue has been split 50/50.

Stage 2 Clear felling 14ha of pines will give actual revenue of \$98,564

Stage 3 Clear-felling of 12ha of pines will give actual revenue of \$144,168

Stage 4 Clear-felling of 11.3ha of pines will give actual revenue of \$126,946

Lost Revenue Retaining 18.1ha of pines on the western slope will mean forgoing \$118,202 of revenue.

SPICER FOREST - Option 1a:									
Log Everything - Retain 11.5ha of Pines Around Landfill									
(6.5ha of SPIC03, 3.5ha of SPIC01 and 1.5ha of Reserve)									
Grade and Revenue Analysis: SPIC03 27.1ha									
Grade	P1	P2	S	K	Domestic	Pulp			
SPIC03 t/ha	3	24	82	110	60	130			
Volume @27.1ha	81.3	650.4	2222.2	2981	1626	3523			11083.9
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00			
Total @27.1ha	\$ 9,756.00	\$ 61,788.00	\$ 188,887.00	\$ 217,613.00	\$ 97,560.00	\$ 105,690.00			\$ 681,294.00
Cost and Revenue Analysis:									
Revenue	\$ 681,294.00								
Volume (t)	11083.9								
Logging costs (\$/t)	30.50 \$ 338,058.95								
Roading costs (\$/t)	3.00 \$ 33,251.70								
Management (\$/t)	0.00 \$								
Cartage (\$/t)	9.00 \$ 99,755.10								
Total (\$/t)	42.50 \$ 471,065.75								
Nett Revenue	SPIC03	\$ 210,228.25	for 27.1ha						(= \$7757.5/ha)
	SPIC03	\$ 50,423.75	for 6.5ha						
	SPIC01	\$ 229,635.00	for 21.0ha						(= \$10,935/ha)
	SPIC01	\$ 38,272.50	for 3.5ha						
	Reserve	\$ 8,598.75	for 1.5ha						
Nett Rev SPIC03 & SPIC01 & Reserv		\$ 97,295.00	(SPIC03 6.5ha + SPIC01 3.5ha + Reserve 1.5ha)						
Total Forest Rev		\$ 757,615.50							
SPIC03 & SPIC01 & Reserve Rev		\$ 97,295.00							
Total Net Rev Option 1a		\$ 660,320.50							

SPICER FOREST - Option 1b:									
Log entire forest.									
Grade and Revenue Analysis: 72.9ha									
Grade	P1	P2	S	K	Domestic	Pulp			
Volume @70.2ha)	2264	2810	4628	9206	5224	10741			34873
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00			
Total	\$ 271,680.00	\$ 266,950.00	\$ 393,380.00	\$ 672,038.00	\$ 313,440.00	\$ 322,230.00			\$ 2,239,718.00
Cost and Revenue Analysis									
Revenue		\$ 2,239,718.00							
Volume (t)		34873							
Logging costs (\$/t)	30.50	\$ 1,063,626.50							
Roading costs (\$/t)	3.00	\$ 104,619.00							
Management (\$/t)	0.00	\$ -							
Cartage (\$/t)	9.00	\$ 313,857.00							
Total (\$/t)	42.50	\$ 1,482,102.50							
Total Net Rev Option 1b	\$	757,615.50							

SPICER FOREST: OPTION 2.0
Staged Logging of The Forest

Grade and Revenue Analysis: SPIC01

SPIC01 - t-ha	30	60	60	145	75	160		
Volume @ 17.5ha (t)	525	875	875	2537.5	1312.5	2625	8750	
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00		
Total	\$ 63,000.00	\$ 83,125.00	\$ 74,375.00	\$ 185,237.50	\$ 78,750.00	\$ 78,750.00	\$ 563,237.50	

SPIC01-t-ha	30	50	60	145	75	160		
Volume @ 3.5ha (t)	105	175	175	507.5	262.5	525	1750	10500
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00		
Total	\$ 12,600.00	\$ 16,625.00	\$ 14,875.00	\$ 37,047.50	\$ 15,750.00	\$ 15,750.00	\$ 112,647.50	

STAGE 1 Log 17.5ha of SPIC01 on Eastern Slope

Cost and Revenue Analysis SPIC01

Area	17.5	
Revenue	\$ 563,237.50	
Volume (t)	8750	
Logging costs (\$/t)	30.50	\$ 266,875.00
Roading costs (\$/t)	3.00	\$ 26,250.00
Management (\$/t)	0.00	\$ -
Cartage (\$/t)	9.00	\$ 78,750.00
Total (\$/t)	42.50	\$ 371,875.00

Cost and Revenue Analysis SPIC01

Area	3.5ha	
Revenue	\$ 112,647.50	
Volume (t)	1750	
Logging costs (\$/t)	30.50	\$ 53,375.00
Roading costs (\$/t)	3.00	\$ 5,250.00
Management (\$/t)	0.00	\$ -
Cartage (\$/t)	9.00	\$ 15,750.00
Total (\$/t)	42.50	\$ 74,375.00

Cost and Revenue Analysis Reserve

Total Revenue	\$ 34,545.00	
Volume (t)	610.5	
Logging costs (\$/t)	30.50	\$ 18,620.25
Roading costs (\$/t)	3.00	\$ 1,831.50
Management (\$/t)	0.00	\$ -
Cartage (\$/t)	9.00	\$ 5,494.50
Total costs (\$/t)	42.50	\$ 25,946.25
Net Revenue	\$ 8,598.75	

Net Revenue Stage 1 \$ 191,362.50

Net Revenue \$ 38,272.50

STAGE 2 Log 14ha (9.0ha of SPIC03 above Landfill, 3.5ha of SPIC01 and 1.5ha of Reserve)

Cost and Revenue Analy

	SPIC03	per ha	SPIC03	SPIC01	Reserve
Area	27.1		9	3.5	1.5
Revenue	\$ 681,294.00	\$ 25,140.00	\$ 226,260.00	\$ 112,647.50	\$ 34,545.00
Volume (t)	11033.9	409	3681	1750	610.5
Logging costs (\$/t)	30.50	\$ 338,058.95	\$ 112,270.50	\$ 53,375.00	\$ 18,620.25
Roading costs (\$/t)	3.00	\$ 33,251.70	\$ 11,043.00	\$ 5,250.00	\$ 1,831.50
Management (\$/t)	0.00	\$ -	\$ -	\$ -	\$ -
Cartage (\$/t)	9.00	\$ 99,755.10	\$ 33,129.00	\$ 15,750.00	\$ 167,582.25
Total (\$/t)	42.50	\$ 471,065.75	\$ 156,442.50	\$ 74,375.00	\$ 25,946.25
Net Revenue Stage 2	\$ 116,688.75		\$ 69,817.50	\$ 38,272.50	\$ 8,598.75

STAGE 3 Log 21.0ha (6.0ha of SPIC02 & 15.0ha of SPIC03)

Cost and Revenue Analy

	SPIC02	per ha	SPIC02	SPIC03
Area	22.1		9	15
Revenue	\$ 818,561.90	\$ 37,039.00	\$ 222,234.00	\$ 377,100.00
Volume (t)	12155	550	3309	6135
Logging costs (\$/t)	30.50	\$ 370,727.50	\$ 100,650.00	\$ 187,117.50
Roading costs (\$/t)	3.00	\$ 36,465.00	\$ 9,900.00	\$ 18,405.00
Management (\$/t)	0.00	\$ -	\$ -	\$ -
Cartage (\$/t)	9.00	\$ 109,395.00	\$ 29,700.00	\$ 55,215.00
Total (\$/t)	42.50	\$ 516,587.50	\$ 140,250.00	\$ 260,737.50
Net Revenue SPIC02	\$ 301,974.40		\$ 81,984.00	\$ 116,362.50

Net Revenue Stage 3 \$ 198,346.50

STAGE 4 Log 20.4ha (3.1ha of SPIC03 & 16.1.0ha of SPIC02 and 1.2 of Amenity)

	SPIC02	per ha	SPIC03	Amenity
Area	16.1		3.1	1.2
Revenue	\$ 596,327.90	\$ 77,934.00	\$ 77,934.00	\$ 29,464.80
Volume (t)	8855	550	1267.9	524.4
Logging costs (\$/t)	30.50	\$ 270,077.50	\$ 38,670.95	\$ 15,994.20
Roading costs (\$/t)	3.00	\$ 26,565.00	\$ 3,803.70	\$ 1,573.20
Management (\$/t)	0.00	\$ -	\$ -	\$ -
Cartage (\$/t)	9.00	\$ 79,695.00	\$ 11,411.10	\$ 4,719.60
Total (\$/t)	42.50	\$ 376,337.50	\$ 53,885.75	\$ 22,287.00
Net Revenue	\$ 219,990.40		\$ 24,048.25	\$ 7,177.80

Net Revenue Stage 4 \$ 251,216.45

Total Net Revenue Option 2.0 \$ 757,614.20

SPICER FOREST: OPTION 4.0									
Staged Logging of The Forest									
Grade and Revenue Analysis: SPIC01									
SPIC01 - t/ha	30	50	50	145	75	160			
Volume @ 17.5ha (t)	525	875	875	2537.5	1312.5	2625			8750
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00			
Total	\$ 63,000.00	\$ 83,125.00	\$ 74,375.00	\$ 185,237.50	\$ 78,750.00	\$ 78,750.00			\$ 563,237.50
SPIC01 - t/ha	30	50	50	145	75	160			
Volume @ 3.5ha (t)	105	175	175	507.5	262.5	525			1750
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00			
Total	\$ 12,600.00	\$ 16,625.00	\$ 14,875.00	\$ 37,047.50	\$ 15,750.00	\$ 15,750.00			\$ 112,647.50
STAGE 1	Log 17.5ha of SPIC01 on Eastern Slope								
Cost and Revenue Analysis SPIC01									
Area	17.5								
Revenue	\$ 563,237.50								
Volume (t)	8750								
Logging costs (\$/t)	30.50	\$ 266,875.00							
Roading costs (\$/t)	3.00	\$ 26,250.00							
Management (\$/t)	3.00	\$ 26,250.00							
Cartage (\$/t)	9.00	\$ 78,750.00							
Total (\$/t)	45.50	\$ 398,125.00							
Net Revenue Stage 1	\$ 165,112.50								
STAGE 2	Log 14ha (9.0ha of SPIC03 above Landfill, 3.5ha of SPIC01 and 1.5ha of Reserve)								
Cost and Revenue Analy									
	SPIC03		per ha	SPIC03		SPIC01		Reserve	
Area	27.1			12	3.3		1.5		
Revenue	\$ 681,294.00	\$ 25,140.00		\$ 226,260.00	\$ 112,647.50	\$ 34,545.00			
Volume (t)	11083.9	409		3681	1750	610.5			
Logging costs (\$/t)	30.50	\$ 338,058.95		\$ 112,270.50	\$ 53,376.00	\$ 18,620.25			
Roading costs (\$/t)	3.00	\$ 33,251.70		\$ 11,043.00	\$ 5,250.00	\$ 1,831.50			
Management (\$/t)	3.00	\$ 33,251.70		\$ 11,043.00	\$ 5,250.00	\$ 1,831.50			
Cartage (\$/t)	9.00	\$ 99,755.10		\$ 33,129.00	\$ 15,750.00	\$ 5,494.50			
Total (\$/t)	45.50	\$ 504,317.45		\$ 167,485.50	\$ 79,625.00	\$ 27,777.75			
Net Revenue Stage 2	\$ 98,564.25			\$ 58,774.50	\$ 33,022.50	\$ 6,767.25			
STAGE 3 & 4	Log 12.0ha (12ha of SPIC02)			(Log 10.1ha SPIC02 and 1.2ha Amenity)					
Cost and Revenue Analy									
	SPIC02		per ha	SPIC02		SPIC02		Amenity	
Area	22.1			12	10.1		1.2		
Revenue	\$ 818,561.90	\$ 37,039.00		\$ 444,468.00	\$ 374,093.90	\$ 29,464.80			
Volume (t)	12155	550		6600	5555	524.4			
Logging costs (\$/t)	30.50	\$ 370,727.50		\$ 201,300.00	\$ 169,427.50	\$ 15,994.20			
Roading costs (\$/t)	3.00	\$ 36,465.00		\$ 19,800.00	\$ 16,665.00	\$ 1,573.20			
Management (\$/t)	3.00	\$ 36,465.00		\$ 19,800.00	\$ 16,665.00	\$ 1,573.20			
Cartage (\$/t)	9.00	\$ 109,395.00		\$ 59,400.00	\$ 49,895.00	\$ 4,719.60			
Total (\$/t)	45.50	\$ 553,052.50		\$ 300,300.00	\$ 252,752.50	\$ 23,860.20			
Net Revenue SPIC02	\$ 265,509.40			\$ 144,168.00	\$ 121,341.40	\$ 5,604.60			
Net Revenue Stage 3 & 4	\$ 271,114.00					548		18.1	
Total Net Rev Option 4	\$ 534,790.75				\$ 126,946.00	27,470.9		7402	

SPICER FOREST - Option 4:

Log everything but retain 18.1ha of pines on western slope (18.1ha of SPIC03)

Grade and Revenue Analysis: SPIC03		18.1ha					
Grade	P1	P2	S	K	Domestic	Pulp	
SPIC03 t/ha	3	24	82	110	60	130	
volume @ 18.1ha	54.3	434.4	1484.2	1991	1086	2353	7402.9
\$/t	\$ 120.00	\$ 95.00	\$ 85.00	\$ 73.00	\$ 60.00	\$ 30.00	
Total @18.1ha	\$ 6,516.00	\$ 41,268.00	\$ 126,157.00	\$ 145,343.00	\$ 65,160.00	\$ 70,590.00	\$ 455,034.00

Cost and Revenue Analysis: SPIC 03		18.1ha	
Revenue		\$	455,034.00
Volume (t)			7402.9
Logging costs (\$/t)	30.50	\$	225,788.45
Roading costs (\$/t)	3.00	\$	22,208.70
Management (\$/t)	3.00	\$	22,208.70
Cartage (\$/t)	9.00	\$	66,626.10
Total (\$/t)	45.50	\$	336,831.95
Nett Revenue	SPIC03	\$	118,202.05
Forgone Revenue Option 4: \$ 118,202.05			

Appendix 7: Predicted Costs Post Logging

Option	Post logging Operation	Area	WCC Costs	PCC Costs
<p>1a. Clearfell the forest in 2016 and manage the land back into Indigenous vegetation. (Retain Radiata on slope above landfill -10ha)</p> <p>*Clear-fell area = 62.9ha WCC=40.8ha PCC= 22.1ha</p> <p>*Native replanting area = 25ha Native planting @ \$7.00 per plant, planted.</p> <p>*Area left to naturally regenerate = 37.9ha.</p>	<p>Yr1.</p> <ul style="list-style-type: none"> o Skid sites - Removal of logging waste along access ways/ future parking areas. o Over sowing* @ \$350/ha. o Native replanting* o Weed/pest control 	<p>5 skid sites</p> <p>WCC=40.8ha PCC= 22.1ha</p> <p>5,000 plants @ 2m x 2m = 1ha 50,000 plants@ 2m x 2m = 10ha</p> <p>62.9ha</p>	<p>\$30,000</p> <p>\$14,280</p> <p>\$35,000</p> <p>\$20,000</p>	<p>\$30,000</p> <p>\$7,735</p> <p>\$350,000</p> <p>\$20,000</p>
<p>Total Yr 1.</p>			<p>\$99,280</p>	<p>\$407,735</p>
	<p>Yr 2 - 5.</p> <ul style="list-style-type: none"> o Native replanting* WCC land PCC land o Weed/pest control o Road/track maintenance 	<p>20,000 plants @ 2m x 2m = 4ha 50,000 plants@ 2m x 2m = 10ha</p>	<p>\$140,000</p> <p>\$40,000</p> <p>\$15,000</p>	<p>\$350,000</p> <p>\$20,000</p> <p>-</p>
<p>Total Cost Option 1a. Yrs 1 - 5</p>	<p>Total Yr 2 - 5.</p>		<p>\$195,000</p> <p>\$294,280</p>	<p>\$370,000</p> <p>\$777,735</p>

Option	Post logging Operation	Area	WCC Cost	PCC Cost
<p>1b. Clearfell the forest in 2016 and replant in exotic species.</p> <p>*Clear-fell area = 72.9ha WCC land = 40.8 ha PCC land = 32.1 ha</p> <p>*17.5ha left to regenerate back into indigenous bush.</p>	<p>Yr1.</p> <ul style="list-style-type: none"> ◦ Skid sites - removal of logging waste along access ways/ future parking areas. ◦ Oversowing @ \$350ha ◦ Replanting pines @ 1000sph = \$600 per ha. ◦ Leave eastern slope above Tawa to naturally regenerate – amenity plant. ◦ Weed control ◦ Replant Eucalypts @500sph on lower slopes along Ohariu Stream = \$2775/ha. ◦ Replant D. Fir @ 1000sph on steep western slopes above Ohariu Stream @ 	<p>5 skid sites</p> <p>WCC=40.8 ha PCC=32.1 ha</p> <p>WCC=17.8 ha PCC=3.5 ha</p> <p>5,000 plants @ 2m x 2m = 1 ha 17.5 ha</p> <p>10 ha</p> <p>22.1 ha</p>	<p>\$30,000</p> <p>\$14,280</p> <p>\$10,680</p> <p>\$35,000</p> <p>\$15,000</p> <p>\$13,875</p>	<p>\$30,000</p> <p>\$11,235</p> <p>\$2,100</p> <p>-</p> <p>-</p> <p>\$13,875</p> <p>\$31,757</p>

	\$1,437 per ha			
Total Yr 1.			\$118,835	\$88,967
Yr 2 - 5.				
o Amenity plant		5,000 plants @ 2m x 2m = 1 ha	\$35,000	-
o Spot spraying pines @ \$110/ha		WCC = 17.8 ha PCC = 3.5 ha	\$ 1,958	\$ 385
o Weed control		17.5 ha	\$15,000	-
o Blanking Eucs		10 ha	\$ 1,500	\$1,500
o Blanking and Chem control of D.Fir @ \$643/ha		22.1ha	-	\$14,210
o Mgnt/Insurance			\$ 8,000	\$ 8,000
Total Yr 2 - 5.			\$61,458	\$24,095
Yr 6 - 12.				
o Prune 1 @ \$650/ha		21.3ha	\$11,570	\$ 2,275
o Thin 1 @ \$350/ha		WCC 22.8 ha, PCC 30.6 ha	\$ 7,980	\$10,710
o Thin 2 @ \$350/ha		WCC 17.8 ha PCC = 25.6 ha	\$ 6,230	\$ 8,960
Mgnt/Insurance			\$ 8,000	\$ 8,000
Total Yr 6 - 12.			\$33,780	\$29,945
Total Cost Option.1b. Yrs 1 - 12			\$214,073	\$143,007

Option	Post logging Operation	Area	WCC Cost	PCC Cost
2. Staged logging. Stage 1: Log 17.5ha in 2016. WCC land = 17.5ha * Native planting @ \$7.00 per Plant, planted.	Yr 1. <ul style="list-style-type: none"> o Skid sites cleanup – removal of logging waste along access ways / future parking areas. o Over-sowing @ \$350/ha o Native replanting o Weed/pest control o Track development in un-logged area 	2 skid sites 17.5 ha 5,000 plants @ 2m x 2m = 1ha 17.5 ha	\$20,000 \$6,125 \$35,000 \$15,000 \$10,000	- - - -
	Total Yr 1.		\$86,125	\$ -
	Yr 2 – 5. <ul style="list-style-type: none"> o Native Replanting o Weed control o Track development and maintenance o Remove naturally regenerated pines @ Yr 3 	5,000 plants @ 2m x 2m = 1 ha 17.5 ha 17.5 ha	\$35,000 \$60,000 \$10,000 \$7,000	- - - -
	Total Yr 2 – 5.		\$112,000	\$ -
	Total Cost Stage 1. Yrs 1 - 5		\$198,125	\$ -

Option	Post logging Operation	Area	WCC Cost	PCC Cost
<p>2. Staged logging. Stage 2: Log 14.0ha in 2030. PCC land = 14.0 ha</p> <p>* Native planting @ \$7.00 per Plant, planted.</p>	<p>Yr 1.</p> <ul style="list-style-type: none"> o Skid sites cleanup – removal of logging waste along access ways / future parking areas. o Over-sowing @ \$350/ha o Native replanting o Weed/pest control o Track development in un-logged area 	<p>1 skid site</p> <p>14 ha</p> <p>20,000 plants @ 2m x 2m = 4ha 14 ha</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>\$10,000</p> <p>\$5,000</p> <p>\$140,000</p> <p>\$15,000</p> <p>\$10,000</p>
	<p>Total Yr 1.</p>		<p>\$ -</p>	<p>\$180,000</p>
	<p>Yr 2 – 5.</p> <ul style="list-style-type: none"> o Native Replanting o Weed control o Track development and maintenance o Remove naturally regenerated pines @ Yr 3 	<p>50,000 plants @ 2m x 2m = 10 ha 14 ha</p> <p>14 ha</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>\$350,000</p> <p>\$45,000</p> <p>\$10,000</p> <p>\$14,000</p>
	<p>Total Yr 2 – 5.</p>		<p>\$ -</p>	<p>\$419,000</p>
<p>Total Cost Stage 2. Yrs 1 - 5</p>			<p>\$ -</p>	<p>\$599,000</p>

Option	Post logging Operation	Area	WCC Cost	PCC Cost	
<p>2. Staged logging. Stage 3: Log 21ha in 2040. WCC land = 6 ha PCC land = 15 ha</p> <p>* Native planting @ \$7.00 per Plant, planted.</p>	<p>Yr 1.</p> <ul style="list-style-type: none"> Skid sites cleanup – removal of logging waste along access ways / future parking areas. Over-sowing @ \$350/ha Native replanting Weed/pest control 	<p>2 skid site</p> <p>WCC = 6 ha PCC = 15ha</p> <p>5000 plants @ 2m x 2m = 1 ha 25,000 plants @ 2m x 2m = 5ha</p>	<p>\$10,000</p> <p>\$ 2,100</p> <p>\$35,000</p> <p>\$10,000</p>	<p>\$10,000</p> <p>\$5,250</p> <p>\$175,000</p> <p>\$40,000</p>	
	<p>Total Yr 1.</p>			\$57,100	\$230,250
	<p>Yr 2 – 5.</p> <ul style="list-style-type: none"> Native Replanting Weed control Track development and maintenance Remove naturally regenerated pines @ Yr 3 	<p>5000 plants @ 2m x 2m = 1 ha 50,000 plants @ 2m x 2m = 10 ha WCC = 6 ha PCC = 15ha</p> <p>WCC = 6ha PCC = 15ha</p>	<p>\$35,000</p> <p>\$30,000</p> <p>\$10,000</p> <p>\$5,000</p>	<p>\$350,000</p> <p>\$90,000</p> <p>\$10,000</p> <p>\$14,000</p>	
	<p>Total Yr 2 – 5.</p>			\$80,000	\$464,000
	<p>Total Cost Stage 3. Yrs 1 - 5</p>			\$137,100	\$694,250

Option	Post logging Operation	Area	WCC Cost	PCC Cost	
<p>2. Staged logging. Stage 4: Log 20.4ha in 2050. WCC land = 17.3 ha PCC land = 3.1 ha</p> <p>* Native planting @ \$7.00 per Plant, planted.</p>	<p>Yr 1.</p> <ul style="list-style-type: none"> Skid sites cleanup – removal of logging waste along access ways / future parking areas. Over-sowing @ \$350/ha Native replanting Weed/pest control 	<p>2 skid site</p> <p>WCC = 17.3 ha PCC = 3.1ha</p> <p>5000 plants @ 2m x 2m = 1 ha 12,500 plants @ 2m x 2m = 2.5ha</p>	<p>\$20,000</p> <p>\$6,055</p> <p>\$35,000</p> <p>\$20,000</p>	<p>-</p> <p>\$1,080</p> <p>\$87,500</p> <p>\$10,000</p>	
	<p>Total Yr 1.</p>			\$81,055	\$98,580
	<p>Yr 2 – 5.</p> <ul style="list-style-type: none"> Native Replanting Weed control Track development and maintenance Remove naturally regenerated pines @ Yr 3 	<p>WCC = 17.3 ha PCC = 3.1ha</p> <p>WCC = 17.3ha PCC = 3.1ha</p>	<p>-</p> <p>\$40,000</p> <p>\$10,000</p> <p>\$15,000</p>	<p>\$20,000</p> <p>\$10,000</p> <p>\$5,000</p>	
	<p>Total Yr 2 – 5.</p>			\$65,000	\$35,000
	<p>Total Cost Stage 4. Yrs 1 - 5</p>			\$146,055	\$133,580

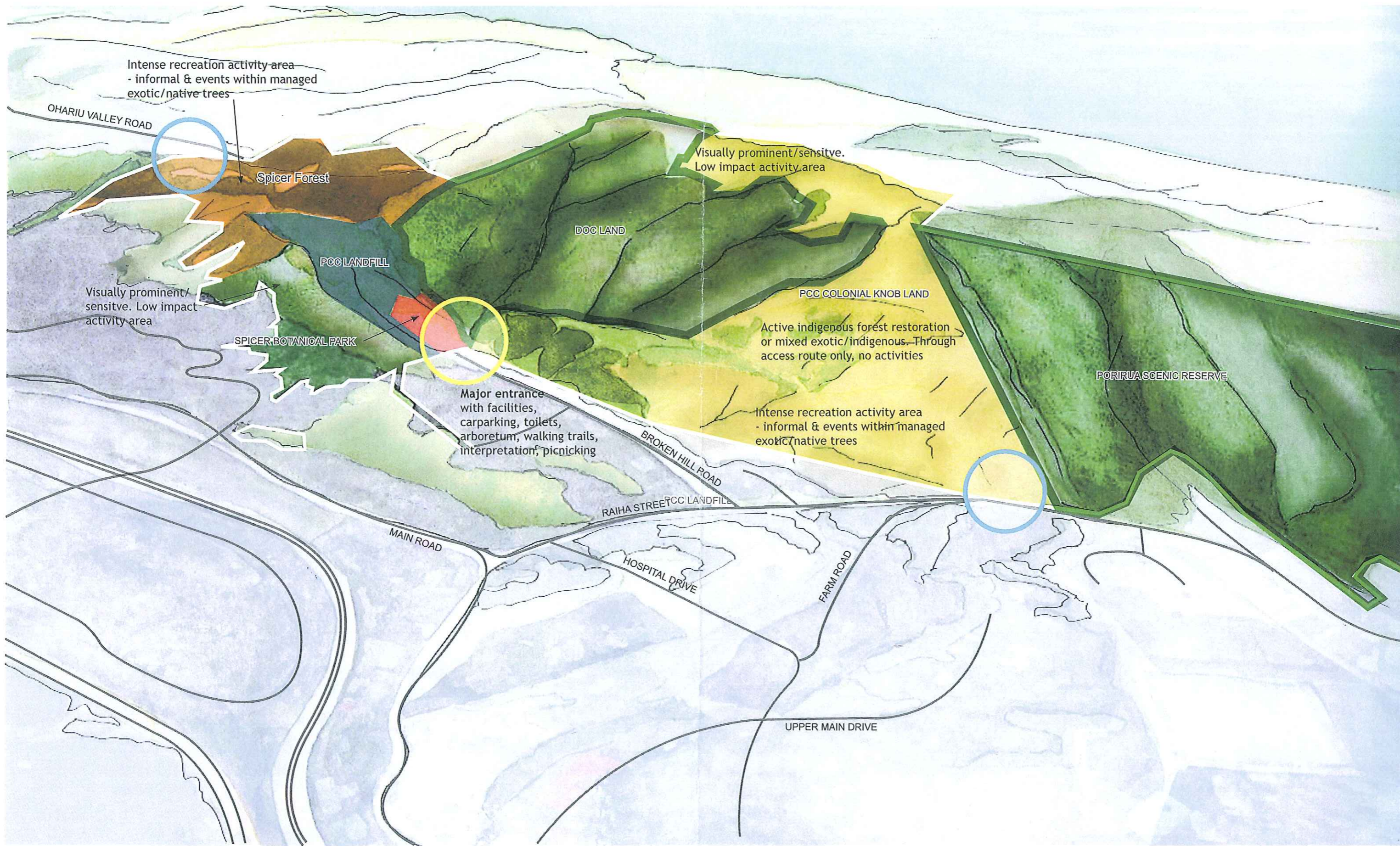
Option	Infrastructure required	Area	WCC Cost	PCC Cost
3. Retain Forest	Yr 1 -5. <ul style="list-style-type: none"> • New tracks. • Gates, car parking • Ongoing track maintenance. • Signage • Amenity planting • Tree Maintenance. 	(Meridian possible contribution to WCC \$150k - Meridian possible contribution to PCC \$150 k)	\$50,000 \$20,000 \$5,000 \$7,000 \$25,000 -	\$50,000 \$20,000 \$5,000 \$7,000 \$25,000 -
Total			\$107,000	\$107,000

Option	Post logging Operation	Area	WCC Cost	PCC Cost
<p>4. Staged logging. Stage 1: Log 17.5ha in 2016. WCC land = 17.5ha</p> <p>* Native planting @ \$7.00 per Plant, planted.</p>	<p>Yr 1.</p> <ul style="list-style-type: none"> o Skid sites cleanup – removal of logging waste along access ways / future parking areas. o Over-sowing @ \$350/ha o Native replanting o Weed/pest control o Track development in un-logged area 	<p>2 skid sites</p> <p>17.5 ha</p> <p>5,000 plants @ 2m x 2m = 1ha 17.5 ha</p>	<p>\$20,000</p> <p>\$6,125</p> <p>\$35,000</p> <p>\$15,000</p> <p>\$10,000</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>
<p>Total Yr 1.</p>			<p>\$86,125</p>	<p>\$ -</p>
	<p>Yr 2 – 5.</p> <ul style="list-style-type: none"> o Native Replanting o Weed control o Track development and maintenance o Remove naturally regenerated pines @ Yr 3 	<p>5,000 plants @ 2m x 2m = 1 ha 17.5 ha</p> <p>17.5 ha</p>	<p>\$35,000</p> <p>\$60,000</p> <p>\$10,000</p> <p>\$7,000</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p>
<p>Total Yr 2 – 5.</p>			<p>\$112,000</p> <p>\$198,125</p>	<p>\$ -</p> <p>\$ -</p>
<p>Total Cost Stage 1. Yrs 1 - 5</p>				

Option	Post logging Operation	Area	WCC Cost	PCC Cost
4. Staged logging. Stage 2: Log 14.0ha in 2030. PCC land = 14.0 ha * Native planting @ \$7.00 per Plant, planted.	Yr 1. <ul style="list-style-type: none"> o Skid sites cleanup – removal of logging waste along access ways / future parking areas. o Over-sowing @ \$350/ha o Native replanting o Weed/pest control o Track development in un-logged area 	1 skid site 14 ha 20,000 plants @ 2m x 2m = 4ha 14 ha	- - - -	\$10,000 \$5,000 \$140,000 \$15,000 \$10,000
	Total Yr 1.		\$ -	\$180,000
	Yr 2 – 5. <ul style="list-style-type: none"> o Native Replanting o Weed control o Track development and maintenance o Remove naturally regenerated pines @ Yr 3 	50,000 plants @ 2m x 2m = 10 ha 14 ha 14 ha	- - -	\$350,000 \$45,000 \$10,000 \$14,000
	Total Yr 2 – 5.		\$ -	\$419,000
	Total Cost Stage 2. Yrs 1 - 5		\$ -	\$599,000

Option	Post logging Operation	Area	WCC Cost	PCC Cost
<p>4. Staged logging. Stage 3: Log 12ha in 2040. WCC land = 12 ha PCC land = 0 ha</p> <p>* Native planting @ \$7.00 per Plant, planted.</p>	<p>Yr 1.</p> <ul style="list-style-type: none"> Skid sites cleanup – removal of logging waste along access ways / future parking areas. Over-sowing @ \$350/ha Native replanting Weed/pest control 	<p>2 skid site</p> <p>WCC = 12 ha</p> <p>5000 plants @ 2m x 2m = 1 ha</p>	<p>\$20,000</p> <p>\$ 4,200</p> <p>\$35,000</p> <p>\$10,000</p>	<p>\$0</p> <p>\$0</p> <p>\$0</p> <p>\$0</p>
	<p>Total Yr 1.</p>		\$69,200	\$0
	<p>Yr 2 – 5.</p> <ul style="list-style-type: none"> Native Replanting Weed control Track development and maintenance Remove naturally regenerated pines @ Yr 3 	<p>5000 plants @ 2m x 2m = 1 ha</p> <p>WCC = 12 ha</p>	<p>\$35,000</p> <p>\$30,000</p> <p>\$10,000</p> <p>\$5,000</p>	<p>\$0</p> <p>\$0</p> <p>\$10,000</p> <p>\$0</p>
	<p>Total Yr 2 – 5.</p>		\$80,000	\$10,000
	<p>Total Cost Stage 3. Yrs 1 - 5</p>		\$149,200	\$10,000

Option	Post logging Operation	Area	WCC Cost	PCC Cost
<p>4. Staged logging. Stage 4: Log 11.3ha in 2050. WCC land = 11.3 ha PCC land = 0 ha</p> <p>* Native planting @ \$7.00 per Plant, planted.</p>	<p>Yr 1.</p> <ul style="list-style-type: none"> Skid sites cleanup – removal of logging waste along access ways / future parking areas. Over-sowing @ \$350/ha Native replanting Weed/pest control 	<p>2 skid site</p> <p>WCC = 11.3 ha</p> <p>5000 plants @ 2m x 2m = 1 ha</p>	<p>\$20,000</p> <p>\$3,955</p> <p>\$35,000</p> <p>\$10,000</p>	<p>-</p> <p>\$0</p> <p>\$0</p> <p>\$0</p>
	<p>Total Yr 1.</p>		\$68,955	\$0
	<p>Yr 2 – 5.</p> <ul style="list-style-type: none"> Native Replanting Weed control Track development and maintenance Remove naturally regenerated pines @ Yr 3 	<p>5000 plants @ 2m x 2m = 1 ha WCC = 11.3 ha</p>	<p>\$35,000</p> <p>\$40,000</p> <p>\$10,000</p> <p>\$10,000</p>	<p>-</p> <p>\$0</p> <p>\$10,000</p> <p>\$0</p>
	<p>Total Yr 2 – 5.</p>		\$95,000	\$10,000
	<p>Total Cost Stage 4. Yrs 1 - 5</p>		\$163,955	\$10,000



Intense recreation activity area
- informal & events within managed
exotic/native trees

Spicer Forest

Visually prominent/sensitive.
Low impact activity area

DOC LAND

PCC LANDFILL

PCC COLONIAL KNOB LAND

Visually prominent/
sensitive. Low impact
activity area

Active indigenous forest restoration
or mixed exotic/indigenous. Through
access route only, no activities

SPICER BOTANICAL PARK

PORIRUA SCENIC RESERVE

Major entrance
with facilities,
carparking, toilets,
arboretum, walking trails,
interpretation, picnicking

Intense recreation activity area
- informal & events within managed
exotic/native trees

BROKEN HILL ROAD

RAIHA STREET PCC LANDFILL

MAIN ROAD

HOSPITAL DRIVE

FARM ROAD

UPPER MAIN DRIVE

- Major roads
- Railway line
- Spicer Forest
- Scenic Reserves
- Land in public ownership
- PCC owned Colonial Knob land
- Secondary entrances
- Parking, beginning of trails to activity areas

Recreation activity areas for Spicer
Forest, Colonial Knob, Spicer
Botanical Park

Preliminary Concept