Before the Proposed Te Tai o Poutini Plan Hearings Panel

In the Matter of	the Resource Management Act 1991 (**Act**)
And	
In the Matter of	a submission (S491) and further submission on the Proposed Te Tai o Poutini Plan by Bathurst Resources Limited and BT Mining Limited
And	
In the Matter of	Topic 10B: Ecosystems and Indigenous Biodiversity

Statement of Evidence of **Gary Neil Bramley** for Bathurst Resources Limited and BT Mining Limited

Dated: 30 July 2024

大成 DENTONS KENSINGTON SWAN
18 Viaduct Harbour Avenue
Private Bag 92101
Auckland 1142
P +64 4 472 7877
F +64 4 472 2291
DX SP26517

Solicitor: C Sheard
E: Christina.sheard@dentons.com

lane neave.
Lane Neave
Level 1, 2 Memorial Street
Queenstown 9300
Solicitor Acting: Joshua Leckie
Email: joshua.leckie@laneneave.co.nz
Phone: 03 409 0321

Table of Contents

INTRODUCTION

Qualifications and Experience

1. My name is Gary Neil Bramley. I am the Terrestrial Ecology Team Leader and a Director of EcoLogical Solutions Limited, which is a multi-disciplinary ecology company with offices in Kāeo, Auckland, Tauranga and Nelson.

2. I hold the degrees of Bachelor of Science (1992) and Master of Science (First Class Honours in Ecology, 1995) both from Massey University, and a Doctorate of Philosophy in Biology from the University of Waikato (1999).

3. My previous work experience includes working as an independent consulting ecologist, working as an ecologist for Reconnecting Northland (a landscape scale conservation project in Northland), working as a tutor in Biology at Waikato Polytechnic and as a lecturer in Biology at the University of Waikato. I have worked as a consultant ecologist since 2000, initially for NZ Environmental Limited and then Mitchell Partnerships Limited (now Mitchell Daysh). Between January 2016 and March 2022, I operated my own business (The Ecology Company) which merged with Freshwater Solutions Limited to become EcoLogical Solutions in April 2022.

4. Since 2000 the majority of my relevant work experience has been to undertake or contribute to a large number of ecological investigations, significance assessments and assessments of ecological effects of developments on urban, peri-urban, coastal, forest, wetland, gumland, farmland and subalpine areas throughout New Zealand. I have mainly worked throughout Northland, Auckland, Canterbury, the West Coast of the South Island and the Waitaki and Queenstown Lakes Districts.

5. I have been involved in a variety of development projects in New Zealand, including several plan changes, large-scale subdivisions and retirement villages, infrastructure projects (roading, electricity generation, a monorail, a cycle trail, wastewater treatment), irrigation projects and mining projects. I have carried out assessments of the effects of such schemes on terrestrial and aquatic ecology and have developed, contributed to or managed the implementation of mitigation works including riparian and terrestrial restoration projects. I have developed biodiversity offsets for some of the proposals I have been involved with.

6. I have published or contributed to twelve peer reviewed papers and more than 300 unpublished reports prepared for variety of clients. I have been responsible for the preparation of specialist ecological reports, Assessment of Environmental Effects documentation, management plans and Department of Conservation concession and wildlife permit applications. In July 2017, I completed the “Making Good Decisions” programme and am a certified resource consent hearings commissioner.

7. In 2004 I was awarded an “Old Blue” Conservation Award by the Royal Forest and Bird Protection Society followed in 2006 by a Northland Biodiversity Enhancement Group award for contribution to the conservation of Northland’s natural heritage. In 2018, I was awarded life membership of the Puketi Forest Trust, a charitable trust which I helped establish in 2003 to restore Puketi Forest in Northland.

8. I have provided ecological advice to a range of mining projects over the course of my career, including the following:

   (a) Bathurst Resources Limited and related party coal mines at Stockton, Denniston, Canterbury, Maramarua and Southland.

   (b) Birchfield Mining Limited coal mines at Strongman Mine near Greymouth and Giles Creek near Reefton.

   (c) Francis Mining Group coal mines at Reefton, Roa and Lyell.

   (d) Stevenson Mining Limited proposed coal mine at Te Kuha, near Westport.

   (e) Westland Mineral Sands Limited mineral sand mines near Westport and Hokitika.

   (f) TIGA Minerals and Mining proposed mineral sand mine at Barrytown.

   (g) Oceana Gold Corporation underground gold mine at Waihi.

   (h) Several small gold mines near Hokitika.

9. I have also visited a number of other mines to assess rehabilitation outcomes including Oceana Gold Corporation’s mine at Reefton, Puke Coal (near Huntly) and the access road to Pike River Mine near Greymouth.

10. I was recently a contributing author to a paper entitled “The Biodiversity Compensation Model: a framework to facilitate better ecological outcomes” Baber, M., Quinn, J., Craig, J., Bramley, G., Lowe, M., Webb, C., Ussher, G., Miller, D., Whiteley, C., Kessels, G., Davies, F., Markham, J., van Winkel, D., Wedding, C. and Chapman, S. submitted as a forum article to the New Zealand Journal of Ecology.

11. During the previous field season (2023 – 2024) I led a team of ecologists undertaking a variety of field and other studies at the Buller Coal Plateau on behalf of Bathurst Resources. Studies relevant to this evidence include:

    (a) A plateau-wide contextual study undertaken as a desktop review identifying and summarising all the previous ecological surveys from the Buller Coal Plateau that we could locate.

    (b) Monitoring the survival and persistence of Species of Significance **(SOS**) plant species associated with Escarpment Mine which have been propagated and repatriated to rehabilitated sites.

    (c) Monitoring of natural and directly transferred red tussock and herbfield vegetation associated with Cypress Mining Area.

    (d) A plot-based vegetation classification and mapping survey using data from 190 10m x 10m RECCE plots located in different vegetation types across the Buller Coal Plateau and data from more than 45,000 high resolution photographs taken via a drone.

    (e) An assessment of rehabilitation outcomes for both vegetation and fauna at Stockton Plateau.

12. Some of these workstreams have been completed, others are in the final stage of writing up.

Code of Conduct

13. While this is not an Environment Court hearing I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. This evidence is within my area of expertise, except where I state that I am relying on material produced by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Background and Involvement

14. I have been providing ecology advice to Bathurst Resources Limited and BT Mining Limited (together, **Bathurst**) for eight years. Prior to that I provided advice to Solid Energy at the majority of their mines including Stockton. I first visited the Stockton and Denniston Plateaux in 2009 and have visited multiple times since then. I am familiar with Bathurst's operations on the West Coast.

SCOPE OF EVIDENCE

15. Bathurst have engaged me to provide ecology evidence on Bathurst's submissions on the Proposed Te Tai o Poutini Plan (**TTPP or the Plan**).

16. In this brief of evidence, I will:

    (a) Describe Bathurst's West Coast operations and the environment the operations occur in from an ecological perspective.

    (b) Describe the application of the mitigation hierarchy at the Buller Coal Plateau and how it has affected ecological outcomes there. I begin with a discussion of the effects management hierarchy generally, including the limits to offsetting, then provide specific examples of the application of the hierarchy at various locations within the Buller Coal Plateau to date including avoidance, minimisation, remediation, offsetting and compensation.

    (c) Discuss the National Policy Statement for Indigenous Biodiversity (**NPS-IB**).

    (d) Address Bathurst's submissions on Topic 10: Ecosystems and Indigenous Biodiversity.

    (e) Address any further submissions of relevance to this hearing stream.

EXECUTIVE SUMMARY

17. Bathurst's West Coast operations include Stockton Mine as well as mining licenses, mining permits and exploration permits on the Buller Coal Plateau which covers approximately 4,820ha north of Westport. The Buller Coal Plateau lies within the Ngakawau Ecological District and North Westland Ecological Region.

18. More than 50 ecological surveys have been undertaken in various parts of the Ngakawau Ecological District which have detected at least 585 species of terrestrial plants, 56 bird species (including 28 native species), 458 species of bryophyte (105 mosses, 4 hornworts, 349 liverworts), four species of lizards, more than 300 species of terrestrial invertebrates and 186 taxa of aquatic invertebrates. There are also at least four naturally uncommon ecosystems present within the Ngakawau Ecological District, all of which occur on the Buller Coal Plateau including boulderfields of acidic rock, sandstone erosion pavement; tarns and seepages and flushes. The Buller Coal Plateau includes substantial areas of indigenous vegetation and provides habitat for a very high diversity of indigenous fauna. The previously undisturbed areas would meet the criteria for ecological significance for Significant Natural Areas (**SNA)** as set out in the NPS-IB. Much of the Buller Coal Plateau would meet the

criteria to be considered a natural inland wetland as defined by the National Policy Statement for Freshwater Management 2020 (**NPS-FM**).

19. Coal extraction from the Buller Coal Plateau and elsewhere will often have to occur in places where it will conflict with indigenous biodiversity (or other ecological values) because that is where the coal is.

20. Ecological management methods have steadily improved over time at Stockton Mine as knowledge about the functioning of ecosystems has improved and management practices have been refined. To date approximately 64.5% of Stockton Mine can be considered 'rehabilitated' with 51% being planted and 13.5% being covered with directly transferred vegetation (**VDT**). Soil depth, canopy cover and cover of native species are significantly higher at VDT sites compared to planted sites. VDT sites also have a more similar hydrology to natural areas, whereas planted sites have better drainage, which will influence the terminal vegetation type which will occur there. Exotic species are more prevalent at planted sites. For these reasons, best practice is now moving to a requirement to achieve VDT as part of new consents.

21. Cypress Mining Area (consented 2005) was the first to attempt to offset biodiversity losses associated with its development. Escarpment Mine (granted consents in 2011) was the first to apply compensation to coal mining activities there. Neither were subject to specific accounting methods or an assessment against the principles of offsetting and compensation. Currently approximately 94% of the 5,272ha Buller Coal Plateau receives ecosystem management as part of the Denniston Biodiversity Enhancement Area associated with Escarpment Mine and the Wider Habitat Enhancement Area associated with Cypress Mining Area. These management areas extend beyond the plateau and cover 26% of the Ngakawau Ecological District. There is also a 1,000ha management area in the Oparara Valley to offset rōroa losses from Cypress Mine and a 24,000ha management area in the Heaphy Valley to compensate for residual effects at Escarpment Mine.

22. The relief sought by Bathurst in relation to the ecological objectives and policies are appropriate from an ecological point of view. The effects management hierarchy is recognised as international best practice for managing effects and was intended to be implemented in full, rather than piecemeal, subject to the principles which underly offsetting and compensation which were independently developed internationally.

BATHURST'S WEST COAST OPERATIONS

23. Bathurst is New Zealand's largest coal producing company and is a New Zealand registered, ASX-listed, resource company with the majority of its shareholders being investors from outside New Zealand. All Bathurst's mining operations are located

within New Zealand, being distributed across the West Coast, Southland and Waikato regions. My understanding is that Bathurst's West Coast operations provide high quality metallurgical coal to international steel makers.

24. Bathurst's largest operating mine is the existing Stockton Mine near Westport, but it also owns mining licences or mining permits, and exploration permits, and holds some resource consents, on the Denniston Plateau to the south of Stockton Mine.

25. Despite being commonly used, the names Denniston Plateau, Stockton Plateau and Buller Plateau are not listed in the New Zealand Geographic Board gazetteer of geographical place names. Bathurst and its predecessor, Buller Coal Limited, retained specialist geomorphologists to define the Denniston and Stockton Plateau based on the geomorphological features evident.

26. The Denniston Plateau covers approximately 1,700ha forming a roughly circular area about 4.5km across as shown in **Figure 1** attached to my evidence. The Stockton Plateau covers approximately 3,120ha including five areas between the northern extent of the Denniston Plateau and the Stockton Mine as shown in **Figure 2** attached to my evidence. These areas together (i.e., the Stockton and Denniston Plateaux) are described in more detail in **Appendix 1** attached to my evidence and referred to here as 'the Buller Coal Plateau'.

27. Brunner Coal Measures occupy an area of 26,585ha on the northern West Coast of the South Island between Golden Bay and Ross and extending as far east as the Gordon Range (north of St Arnaud). The approximate extent of Brunner Coal Measures on the Buller Coal Plateau is shown in **Figure 3** attached to my evidence. The extent of Brunner Coal Measures is also discussed in more detail in **Appendix 1** attached to my evidence.

28. The Buller Coal Plateau lies within the Ngakawau Ecological District and North Westland Ecological Region. The North Westland Ecological Region is floristically one of the richest in New Zealand.

29. More than 50 terrestrial and aquatic ecological surveys have been undertaken in various parts of the Ngakawau Ecological District including the Upper Waimangaroa valley and the Buller Coal Plateau, mostly since the early 1990s.

30. Julius von Haast described ascending Mt Rochfort and overlooking the Denniston Plateau in 1861[1] as follows "this plateau is intersected by an incredible number of small streams, rivulets and precipices and is covered with manuka and subalpine scrubs".

[1] Haast, J. 1861. Report of a topographical and geological exploration of the western districts of the Nelson Province, New Zealand. Printed by C. and J. Elliott. 150pp.

31. There is evidence of historic (pre-European) fire across the Buller Coal Plateau and these likely resulted in shallow soils being eroded/blown away resulting in the substantial areas of exposed sandstone pavement interspersed with low stature vegetation present today.

32. Vegetation on the Buller Coal Plateau includes stunted forest, shrubland with a high component of mānuka (*Leptospermum scoparium* agg.), pākihi, and various rushland and tussockland vegetation types. Altitudinal sequences of lowland to subalpine vegetation occur on steep coastal hillslopes such as Mt Frederick (1,105m asl), which overlays fertile gneiss and granite parent material, Mt Rochfort (1,040m asl), which overlies infertile Brunner Coal Measures and Mt William (1,062m asl), which includes both granite and coal measures geology. At these locations lowland mixed beech-kāmahi (*Pterophylla racemosa*)-podocarp (often rimu (*Dacrydium cupressinum*)) forest grades into beech (including both mountain beech (*Fuscospora cliffortioides*) and silver beech (*Lophozonia menziesii*) and Southern rātā (*Metrosideros umbellata*) forest which becomes more stunted with increasing altitude.

33. Mānuka, pink pine (*Halocarpus biformis*), yellow-silver pine (*Lepidothamnus intermedius*) and *Gahnia* spp. are a significant component of the dense shrubland and low stature forest on the high elevation slopes.

34. Vegetation on the gently sloping sandstone pavements of the Buller Coal Plateau is dominated by stunted tussock-shrublands. *Chionochloa* spp. (tussock, including the local endemic coal measures tussock, *C. juncea*), *Gleichenia dicarpa* (tangle fern), *Dracophyllum* spp., wire rush (*Empodisma minus*) and prostrate mānuka are common and widespread. Based on the vegetation alone, large parts of the Buller Coal Plateau meet the criteria for natural inland wetlands in the NPS-FM.

35. The Buller Coal Plateau is the only known area of Brunner Coal Measures geology which covers a large contiguous area (thousands of hectares) and where gently undulating terrain, relatively high altitude, high annual rainfall (4,000 – 6,400mm), poorly drained and infertile soils, and high westerly wind exposure have combined to create a distinctive coal measures vegetation. The Buller Coal Plateau is a low fertility environment with often shallow soils where plant growth is stunted, plants grow slowly and the food supply for animals is constrained. Vegetation forms an intricate mosaic with a high degree of natural edge which forms ecotones between different vegetation associations. This results in a high plant species diversity and a correspondingly high diversity of habitats for fauna. Likely, at least in part, because of the high habitat diversity, a wide range of fauna species occurs on the Buller Coal Plateau. In addition, the Buller Coal Plateau's location, well connected to surrounding habitats which are more fertile and productive (e.g., Orikaka forests

to the west), enables the species present in surrounding areas to visit the plateau and contribute to the diversity of fauna species there.

36. Our contextual study identified at least 585 species of terrestrial plants, 56 bird species (including 28 native species), 458 species of bryophyte (105 mosses, 4 hornworts, 349 liverworts), four species of lizards, more than 300 species of terrestrial invertebrates and 186 taxa of aquatic invertebrates within the Ngakawau Ecological District. There are also at least four naturally uncommon ecosystems present within the Ngakawau Ecological District, all of which occur on the Buller Coal Plateau including boulderfields of acidic rock, sandstone erosion pavement; tarns and seepages and flushes.

EFFECTS MANAGEMENT HIERARCHY

37. In terms of applying the effects management hierarchy, whilst the coal's location is fixed, certain avoidance can and should still be applied to elements such as infrastructure (roads, buildings, water treatment infrastructure including ponds and sumps, the location of overburden dumps and the like) where their location is not important to their function.

38. With respect to minimisation, elements of mine planning and site management can ensure that, for example, areas are rehabilitated promptly, the size of overburden dumps is minimised, edge effects are addressed, and fauna are managed appropriately (e.g., via search and salvage or relocation) to minimise overall effects.

39. As I set out below, site rehabilitation (or remediation) is critical with respect to achieving acceptable long-term ecological outcomes post-mining and best practice is continually being developed as further data is obtained.

40. In my view, both minimisation and remediation are types of mitigation - that is they lessen the overall impact of a proposal.

41. Furthermore, given that some management actions contribute to, or achieve, both mitigation and offsetting, it is important from an overall maintenance of biodiversity perspective that opportunities are not lost due to incorrect, inappropriate or misunderstood 'bottom lines' being applied that limit the ecological outcomes.

42. Biodiversity offsets are measurable conservation outcomes designed to address adverse and unavoidable impacts of projects and result in a no net loss of biodiversity. Offsets are only intended to address any significant residual effects which remain once avoidance, minimisation and remediation options have been exhausted. Offsets must conform to generally agreed principles (e.g., as set out in Appendix 6 of the NPS-FM and Appendix 3 of the NPS-IB (noting that these are not

identical)). These principles include that some ecological values are so vulnerable or irreplaceable that they cannot be offset (the so-called 'limits to offsetting' which I discuss in more detail below).

43. The offsetting process is technical, varies on a case-by-case basis and is heavily reliant on comprehensive data. In my view the TTPP needs to allow the technical assessments to be carefully tested during the consenting process and not apply unreasonable constraints before these knowledge gaps can be filled.

44. Offsets are underpinned by numerical calculations to ensure no net loss (and ideally a net gain) in biodiversity. This is practically easy to achieve for some ecological values (such as the number and diversity of plants per hectare or the number of kiwi in a particular area), but impractical or impossible to achieve for others (such as populations of cryptic or difficult to survey species such as many invertebrates or non-vascular plants).

45. Any offset proposal needs to meet the principles of offsetting and demonstrate no net loss of biodiversity (and in practice a biodiversity gain) via a biodiversity offset accounting model (**BOAM**) to be considered an offset.

46. Biodiversity compensation is designed to compensate for residual effects on biodiversity which cannot be avoided, remedied, minimised or offset. More recently Dr Matt Baber and others have developed a 'Biodiversity Compensation Model' (**BCM**) which is intended for use at the consenting stage of a project when the effects have been identified, but not precisely quantified, as a sense check to confirm that a particular quantum of ecological management is sufficient to address residual effects. The BCM has a number of conservatisms built in and can be backfilled to develop a BOAM as the appropriate data come to hand. Where the BCM has been applied to date it has generally resulted in biodiversity outcomes above and beyond no net loss (i.e., a net gain in biodiversity more than would have been indicated necessary from a BOAM calculation). The NPS-IB provides principles for biodiversity compensation in Appendix 4.

47. It is important that the TTPP provide for the ability to apply the full effects management hierarchy for mineral extraction activities because the location of minerals is fixed. As I have indicated above, much of the vegetation on the Buller Coal Plateau qualifies as natural inland wetland, and most of it also meets the ecological criteria for identifying Significant Natural Areas. Whilst many of the effects of mining can be addressed by the higher elements in the hierarchy, there will be many instances where compensation will be required because of the impossibility of developing a credible BOAM. This includes for cryptic species and those which are impractical to measure.

48. This conclusion does not mean that efforts should not be made to address effects via avoidance, minimisation, remediation and offsetting, but one of the benefits of applying the hierarchy is that it crystalises and makes explicit the different ecological values and how each can be addressed within the hierarchy. This means that, for example, methods to offset loss of a rare liverwort, could be developed as part of minimisation and offsetting, but allowing for compensation enables any risk associated with those strategies to be addressed as well leading to an overall better ecological outcome.

49. The effects management hierarchy (as opposed to the need to 'avoid, remedy or mitigate' adverse effects as set out in Section 5 of the Resource Management Act (1991) without any hierarchy (**RMA**)) is the internationally agreed best practice approach to managing adverse effects on biodiversity values and the management of natural resources and is one of the most important procedural instruments for protecting biodiversity from the impacts of development.

50. As I have described above, the Buller Coal Plateau includes substantial areas of indigenous vegetation and provides habitat for a very high diversity of indigenous fauna. The diverse vascular flora is supported by the highly variable mosaic of topographies, hydrologies, aspects, physiographies and other physical and chemical conditions. The bryophyte flora is highly diverse and includes species which are known to occur at only a few other locations in New Zealand or elsewhere in the world. The invertebrate fauna includes species which are widespread in New Zealand, species which are endemic to the West Coast and species adapted to alpine and/or wet environments. The lizard fauna is a unique assemblage of species. The bird fauna is highly diverse and includes threatened and at risk species. Much of the Buller Coal Plateau can be characterised as a wetland.

51. Coal extraction from the Buller Coal Plateau and elsewhere will often have to occur in places where it will conflict with indigenous biodiversity (or other ecological values) because that is where the coal is.

52. As I have set out above, much of the very high biodiversity of the Buller Coal Plateau can be attributed to its location surrounded by, and well connected to, more fertile habitats from which species can colonise the less favourable coal measures habitats. The altitude, high rainfall and existing management also contribute to maintaining that biodiversity.

53. Provided that overall better ecological outcomes are achieved via the effects management hierarchy, enabling of mineral extraction at the Buller Coal Plateau by the TTPP is not inconsistent with the National Policy Statements.

54. The effects of mining on biodiversity are long-term (years to centuries) and, in some cases, permanent (e.g., changes to hydrology and associated flow on effects on vegetation and habitats), but effective avoidance, remediation and mitigation can substantially reduce these impacts. The background adverse effects on biodiversity due to weeds and pests (including weeds given access via historic mining) are now well established and widespread across the Buller Coal Plateau and beyond. If ecosystem management at the Buller Coal Plateau were to stop, these weeds and pests would increase and expand their influence and native species would decline. Effects management via offsetting and compensation in particular provides a mechanism and a source of funds to implement this vitally important management and meaningfully address adverse effects. Achieving the best ecological outcomes post mining will require a policy framework which recognises a mix of avoidance, remediation, mitigation, offsetting and compensation applied appropriately as part of the effects management hierarchy can achieve the maintenance and protection of indigenous biodiversity as required by the NPS-IB.

Limits to Offsetting and Compensation

55. One of the principles of offsetting is that there are some species, habitats and ecosystems for which biodiversity offsetting is not appropriate. There are a variety of reasons why this may be the case including that the affected biodiversity is irreplaceable or vulnerable, because the effects are unknown or poorly understood or because there are no technically feasible options by which to achieve biodiversity gains in a reasonable timeframe. The particular situation as it applies to a project and the affected biodiversity will vary between projects and across time (e.g., as knowledge improves) and as I have stated above, a substantial amount of data is required, and the assessment is technical in nature.

56. For this reason, each offset and compensation proposal needs to be considered on its own merits at the time of the application for consent. Beyond acknowledging that there are situations where there are limits to offsetting, I do not consider it is helpful to include criteria as to when offsetting and compensation is not available in a planning document such as the TTPP. Including a "technical knock-out" in the policies without allowing robust consideration of the proposals specific context and technical assessment would very likely result in lost opportunities to achieve the overall objective of the NPS-IB and maintain indigenous biodiversity.

57. The multitude of different effects resulting from different projects, the range of species and habitats affected and the variety of potential offset and compensation actions that could theoretically apply, as well as the ecological complexity of habitats (cf. species) such as the Buller Coal Plateau, means that there a large number of possible permutations relating to implementation of an individual offset. Depending

on the number and type of biological attribute being considered, offset calculations can involve the review and synthesis of a large amount of complex data. I do not consider that this complexity can be adequately addressed in a policy setting. By way of example, you could have a policy that offsetting is not appropriate for species which are considered 'threatened'. This would include (but not be limited to) rōroa, *Powelliphanta* snails, West Coast green gecko and several vascular and non-vascular plants (bryophytes). The types of management required to produce more of each of those species so as to achieve no net loss would be different, and for bryophytes, the potential methods available have not been used before on New Zealand species, meaning that there is a higher risk involved in offsetting them, than there is, for example, in offsetting rōroa populations, which are known to respond positively to control of pest mammals. Pilgrim et al (2013[2]) developed a framework for assessing the likelihood that effects can be offset which I have reproduced as Table 1 which demonstrates the complexity of developing appropriate offsets. It also includes consideration of some of the non-biological features of a project. I do not see how such a complex decision process can be simplified to a policy and applied by people who may not have a good understanding of the particulars of the proposal, especially since many of the terms used have not been adequately or consistently defined so that there is a common understanding of their meaning.

[2] Pilgrim, J.D., Brownlie, D.,Ekstrom, J.M.M,, Gardner, T.A., von Hase, A., ten Kate, K., Savy, C.E., Stephens, R.T.T., Temple, H.J., Treweek, J., Ussher, G.T. Ward, G. 2013. A process for assessing the offsetability of biodiversity impacts. Conservation Letters 6:5 376–384.

Issue	Sub-issue	Criterion	Class 1 (lowest likelihood)	Class 2	Class 3	Class 4 (highest likelihood)
Residual impact magnitude	Severity	Declines of each biodiversity feature at a set scale (e.g. per square kilometre)	Severe	Major	Minor	Very limited (but still significant)
	Extent	Proportion of range/population of each biodiversity feature impacted	Majority	Large	Small	Very small (but still significant)
	Duration	Length of impacts, relative to viability of affected biodiversity	Permanent	Long-term	Medium-term	Short-term
Offset opportunity	Options	Potential for restoring affected biodiversity functions elsewhere	None	Possible	Possible	Possible
		Offset options within natural range	Limited	Limited	Reasonable	Great
		For restoration offsets, condition to which offset can be restored compared to impacted feature	Worse	Worse	Equal or Better	Better
		For averted loss offsets, landscape-level condition of affected biodiversity	At or near original; increasing	Good; decreasing	Reasonable; decreasing rapidly	Poor; decreasing rapidly
Offset feasibility	Technical	Availability of proven relevant methods for restoration, protection, etc.	No proven methods	Few proven methods	Some proven methods	Many proven methods
		Adequacy of long-term offset implementation plans	Inadequate	Credible plan exists	Credible plan exists	Credible plan exists
		Adequacy of long-term offset monitoring plans	None	Lacking detail	Adequate	Excellent
	Financial	Funding for long-term offset implementation	Post-impacts	Post-impacts	Some pre-impacts	Fully pre-impacts
		Funding for long-term offset monitoring	None	Inadequate	Lacks funding for independent input	Includes funding for independent input
	Temporal	Time after impacts until offset gains replace affected biodiversity, relative to viability	Long-term	Medium-term	Short-term	Gains prior to impacts
	Capacity	Capacity of offset implementer for relevant methods at necessary scale	Negligible	Limited	Some	High
		Capacity of developer to keep residual impacts within predicted magnitudes	Negligible	Limited	Some	High

Note: Subjective terms (e.g. "major") will need clear, preferably quantitative, definition when locally applied. Overall likelihood of offset success is indicated by the lowest class for which a project is ranked on any table row, from Class 1 (lowest likelihood) to Class 4 (highest likelihood).

Table 1: Example system for assessing the likelihood that project impacts can be successfully offset on the basis of residual impact magnitude, offset opportunity, and feasibility as indicated by offset planning, budget provision, timeliness and capacity (from Pilgrim et al. 2013).

58. I am firmly of the view that offsetting proposals need to be considered on their merits at the consenting stage having given due consideration to all of the relevant evidence and the applicant's ability to demonstrate credibly that the offset will achieve a net gain and conform to the widely accepted principles of offsetting. The alternative is for proposals to meet policy criteria in order to qualify as an offset which will limit both what can be consented and what can be achieved for biodiversity gain.

59. The same applies to compensation proposals, except that compensation by its very nature is likely to be 'out of kind' (i.e., not like for like). This means that it is even more important to consider compensation proposals in the round, on their individual merits and being cognisant of any deficiencies. If the opportunity to pursue offsets is limited and the situations when compensation can be considered are narrowly prescribed via a policy in my view it is highly unlikely that the best ecological outcome will be achieved.

60. Deploying the full effects management hierarchy does not mean that proposals will automatically be granted approval where biodiversity can be or will be compromised,

but it does enable proposals to be evaluated on their merits (and deficiencies) including an assessment of the validity and appropriateness of any offsetting and compensation propose.

CURRENT APPLICATION OF THE EFFECTS MANAGEMENT HIERARCHY AT STOCKTON MINE

61. The effects management hierarchy has not been explicitly applied as a hierarchy to manage effects on biodiversity on the Buller Coal Plateau to date to my knowledge, although the various elements have been applied individually at different times and at different locations.

62. In terms of avoidance, as part of the Cypress Mining Area consents, Solid Energy agreed to give up access to an area known as the Deed Area which was part of an original Recommended Area for Protection identified as part of the Protected Natural Area Programme. The DPPA is another example of an effort to achieve avoidance, although as noted below, the permanent protection of this area could not be agreed.

63. With respect to minimisation, the current practice at Stockton is to search and salvage lizards (skinks and geckos) and *Powelliphanta* snails, including *P. patrickensis* and *P. augusta*. Some lizards and snails are also salvaged as part of VDT operations, although the proportion salvaged this way remains unknown. For *P. augusta,* 7,500 snails and 2,800 eggs have been released back into habitats at Stockton and Denniston covering approximately 70ha. The number of snails and the extent of their range is now substantially more than was known to be the case when the snails were originally salvaged.

64. Another example of minimisation is management of weeds at Denniston as part of the ecosystem management required by the Escarpment Mine consents. This management has reduced the distribution and abundance of weeds, particularly gorse (*Ulex europaeus*) but also heath rush.

65. There are extensive examples of remediation as I describe in more detail below, including both planting and VDT. The ecological outcome of this approach varies according to the method used, but remediation is capable of substantially reducing adverse effects and restoring habitat values similar to those pre-mining in the medium to long term (years), particularly if VDT is used.

66. As I set out below, both Cypress Mining Area and Escarpment Mine resource consent conditions include ecosystem management which has more than likely offset effects, particularly on birds, but they have not been the subject of a specific biodiversity loss/gain calculation. These actions have maintained bird populations,

including rōroa, within and around the Buller Coal Plateau and allowed them to increase in number there and return to rehabilitated sites as they become available.

67. Also, as I have set out below, the Heaphy compensation programme has resulted in biodiversity gains in Kahurangi National Park, but this was not the subject of a formal compensation calculation.

68. As I have detailed in paragraph 84, 94% of the Buller Coal Plateau is already being managed and this extends beyond the plateau to cover 26% of the Ngakawau Ecological District. The opportunities for additional ecosystem management in the form of offsetting within the Buller Coal Plateau itself are therefore limited, because there are few areas that contain like for like (i.e., the same) biodiversity values not already being managed. Future management is likely to occur in different, but adjoining, habitats and would therefore be unable to fully comply with the principles of offsetting, but would meet the principles of compensation and contribute positively to maintaining biodiversity values on the plateau because of their intact and functional ecological connection. Without the ability to consider compensation in particular, the best ecological outcome for any particular future mining proposal is unlikely to be achieved.

69. Both the NPS-FM and NPS-IB provide for the full application of the effects management hierarchy, including offset and compensation, although as I have noted above, the principles outlined in each document, although very similar, are not identical.

HISTORY OF REHABILITATION/REMEDIATION

70. Mining on the Buller Coal Plateau dates back to approximately the 1860s. Historically there was very little management of the ecological effects of mining. Rehabilitation standards have changed drastically over the more than 160 years that mining has been taking place on the Buller Coal Plateau, and since the first meaningful attempts at rehabilitation were made in the 1990s.

71. It is only relatively recently (since the Stockton Coal Mining Licence was granted consent in 1990), that consent conditions have applied relating to maintenance or protection of vegetation and fauna from the effects of mining. All of the land use activities authorised by the CMLs are currently under way and most remaining activities relate to rehabilitation (including rehabilitation from mining previously undertaken by the Crown which Bathurst is carrying out under the Crown indemnity).

72. Ecological management methods have steadily improved over time as knowledge about the functioning of ecosystems has improved and management practices have been refined. Cypress Mining Area (consented 2005) was the first to attempt to

offset biodiversity losses for rōroa and forest birds. Escarpment Mine (granted consents in 2011) was the first one to apply compensation to coal mining activities there.

73. The first rehabilitation trials took place at Stockton in 1990. The goal of these early rehabilitation efforts was to build up organic matter and nitrogen to boost plant growth and achieve stabilisation of sediments in the high rainfall environment at Stockton, thereby assisting in preventing sediment discharge to streams. Of the methods trialled, only direct seeding and fertilising lotus at a trial called 'Stonehenge' achieved this result. An exotic rush (*Juncus squarrosus*, heath rush) was also propagated and planted because it was easy to establish on waste rock surfaces and initially it was thought to be a native *Carpha* species. *J. squarrosus* is now a major environmental weed at Stockton and Denniston.

74. Solid Energy began developing VDT as a rehabilitation technique in the late 1990s. Methods of VDT have been refined over time. The conditions of the Stockton CML require Bathurst to continue implementing a research programme to continually refine best practice for rehabilitation and that work is ongoing. As rehabilitation moves across separate mining areas within the plateau, rehabilitation methods are implemented in response to the type of environment being rehabilitated and the rehabilitation resources available.

CURRENT REMEDIATION ACTIVITIES

75. There are currently three main rehabilitation approaches at Stockton to establish vegetation on the post-mining engineered landform (**ELF**):

    (a) broadcast sowing or hydroseeding of exotic grasses and lotus (*Lotus pedunculatus*) which are later interplanted with native plants (this approach normally requires fertliser input to achieve growth);

    (b) planting of a range of nursery grown native seedlings into unvegetated topsoils; and

    (c) vegetation direct transfer (**VDT**).

76. Unsurprisingly, the outcomes with respect to indigenous species/biodiversity are very different for each approach. One of the important ecological drivers for rehabilitated habitats is hydrology, which can be substantially modified by mining. Restoration of more natural hydrologies sufficient to maintain red tussock (wetland) vegetation, at least for the ten years it has been in storage, has been achieved at McCabe's tussock storage pad and is expected to be achievable elsewhere.

77. Rehabilitation is carried out progressively over time. As at June 2024, approximately 474ha of the c. 787ha active site at Stockton Mine has been rehabilitated to varying degrees. This includes c. 4.5ha of Stage 1 rehabilitation ('bulk shaped waste rock'), c. 3.4ha of Stage 2 rehabilitation ('capped with granite and soiled'), c. 402ha of Stage 3 rehabilitation ('planting') and c. 64ha of VDT as shown in **Figure 4** attached to my evidence. This represents approximately 0.6%, 0.4%, 51% and 13.5% of the active site respectively. Stage 1 and Stage 2 rehabilitation sites will move to Stage 3 over time. To date approximately 64.5% can be considered 'rehabilitated' (Stage 3) with 51% being planted and 13.5% being VDT. Some of this vegetation, particularly the planted areas, requires time to achieve a state that can be considered closure ready. Planted areas will improve for biodiversity as habitats develop over time, but are very unlikely to ever resemble natural vegetation because of the species used and the altered hydrology. Offsetting would be required to achieve no net loss of biodiversity in a reasonable timeframe for most planted sites. VDT areas will also improve over time, but from a much higher base, and the best are almost indistinguishable from pre-mining habitats, so can achieve no net loss of biodiversity, or very close to it, with limited further management. For this reason, best practice is now moving to a requirement to achieve VDT for new consents. For example:

(a) The resource consent conditions associated with Cypress Mining Area include a requirement to complete 12.5ha of VDT of red tussock grassland and herbfield vegetation and there are closure criteria (standards) with respect to species diversity and weed presence.

(b) At Escarpment Mine, 19 vascular plant species of conservation interest or with distinctive distributions (referred to in the conditions and here as 'species of significance' or more colloquially as 'SOS plants') must be returned to habitats there before the mine can be closed. As well as conditions relating to SOS plants, there are also conditions relating to vegetation more generally and to the rehabilitation of species of significance and the vegetation associations/communities of which they are part. The relevant conditions include:

(i) Mine site rehabilitation closure criteria for vegetation, to be assessed in relation to corresponding attributes of the pre-mining vegetation. The closure criteria set cover levels for vascular vegetation and minimum requirements for establishment of species of significance and maximum cover levels for weeds.

(ii) A requirement for a Mine Site Rehabilitation section within the Ecology and Heritage Management Plan which includes objectives

for vegetation rehabilitation and population outcomes for species of significance.

(iii) A requirement to survey for "Threatened" and "At Risk" plants prior to commencing mining, and to define their habitat characteristics to enable creation of suitable habitats at rehabilitated sites.

(iv) A requirement for baseline vegetation monitoring survey using an agreed methodology for the purpose of identifying the pre-mining condition of vegetation.

78. This requirement is based on evidence gathered by Dr Robyn Simcock (Manaaki Whenua – Landcare Research) and others, including myself, as to the relative rehabilitation outcomes of the various approaches. The most recent data in this regard was collected by my team during the previous field season. Table 2 below shows a summary of rehabilitation outcomes for vegetation at Stockton from our summer 2023 – 2024 surveys.

Site	n	ground cover veg. (%)	ground cover non-vasc. (%)	ground cover litter (%)	ground cover rock (%)	total veg cover (%)	top height (m)	soil depth (mm)	no. of species per plot	
									min	max
Direct Transfer	8	83	6	7	2	137	1.0	409	27	45
Planted	7	54	16	6	20	91	0.6	229	15	43
Man-made Tarn	12	60	10	2	21	97	0.6	280	13	46
Natural Tarn	6	77	7	3	4	104	0.6	374	22	34
Disturbed Site	6	62	22	8	6	112	0.9	235	14	27
Natural Site	10	72	15	11	2	184	2.2	366	13	46
Drill Sites*	32	53	11	4	21	104	0.7	202	7	30

*excluded from statistical analyses

Table 2: Subset of environmental variables (average) for rehabilitated and natural sites.

79. Soil depth, canopy cover and cover of native species were significantly higher at VDT sites compared to planted sites, whereas the percentage cover of rock, bare ground and non-vascular vegetation was higher at planted sites. VDT sites had poor to moderate-draining soil, typical of a natural coal measures ecosystem, whereas planted sites had moderate to well-draining soils, which will influence the terminal vegetation type which will occur there. Exotic species were more prevalent at planted sites, with heath rush (*Juncus squarrosus*) present at all seven planted sites and in five of eight VDT sites.

80. Monitoring at the tussock storage pad constructed for Cypress Mining Area has taken place since 2014. Storage pads were required because vegetation was not able to be directly transferred because the mining schedule meant that there was no ELF available to receive vegetation as it was removed. The vegetation therefore had to be relocated and stored until the ELF is ready to receive it (I have called this 'indirect VT"). This monitoring has demonstrated that three of the four relevant closure criteria for the Cypress Mining Area can currently be met, viz:

    (a) 75% of species present in pre-mining transects are present;

    (b) All species present at > 20% frequency at transect pre-mining are present.

    (c) Mean wet tussock wetland cover > or equal to 90%.

81. The one closure criteria that is not being met currently is with respect to weed coverage. The closure standard is that the percentage and frequency of exotic species be less than or equal to 5%. This metric is currently sitting around 8 – 10%, but previous monitoring has confirmed that localised weed control is effective at reducing this and that native species recolonise. Since the vegetation has not been returned to the Cypress Mining Area, it is not a requirement to meet these criteria currently, but they have been assessed so as to inform whether the vegetation is tracking so that closure can be achieved in future. In my view closure will be achievable, but will require ongoing weed control (which is occurring).

82. The average number of native species in red tussock monitoring plots has increased from an average of 10 prior to transfer to just over 14 in 2024. Vegetation cover has fluctuated, sometimes substantially (up to 50% per annum), but this has also occurred in plots with natural vegetation alongside the western edge of the Cypress North pit and vegetation losses have generally been recovered with native species in one or a few years following a decline in cover.

83. With respect to birds, five-minute bird counts at rehabilitated sites in 2021 recorded eight species (six indigenous and two exotic), including New Zealand pipit (*Anthus novaeseelandiae*) and South Island fernbird (*Poodytes punctatus punctatus*), both of which are considered At Risk – Declining. In 2024, 15 species were recorded (ten indigenous and five exotic) at the same sites including South Island robin (*Petroica australis australis*), South Island fernbird and New Zealand pipit (all of which are regarded as At Risk – Declining). Rōroa (great spotted kiwi) have also been recorded using four of nine rehabilitated sites in 2021 and two of three sites in 2024.

CURRENT OFFSETTING ACTIVITIES

84. Currently approximately 94% of the 5,272ha Buller Coal Plateau receives ecosystem management as shown in **Figure 5** attached to my evidence. This management mostly takes the form of weed and pest control funded by Bathurst Resources as part of the Denniston Biodiversity Enhancement Area (**DBEA** 1,742ha) associated with Escarpment Mine and the Wider Habitat Enhancement Area (**WHEA**, 1,588ha) associated with Cypress Mining Area.

85. Within the 4,509ha DBEA is the Denniston Permanent Protection Area (718ha). The intention of the DPPA was for the consent holder to undertake 'best endeavours' to secure permanent protection from mining (i.e., avoidance), but I understand the parties involved were unable to reach agreement and that protection has not been achieved.

86. Within the 8,000ha WHEA there is a smaller Snail Enhancement Area ('SEA') which covers 893ha of the Buller Coal Plateau. Also created as part of the Cypress Mining consents, was a requirement to manage 1000ha in the Oparara valley for the period mining plus 21 years in order to 'offset' rōroa and forest bird losses. The loss of rōroa and forest birds at the Cypress Mining Area has never been the subject of a BOAM, although radio-tracking of rōroa in the area indicates no rōroa have died and successful breeding has occurred, indicating that any gain in the Oparara area would be a net gain in rōroa, although the situation is less clear for forest birds.

87. There are also areas managed for Mt Augustus snail protection dating from when mining commenced at Mt Augustus in 2006. These management areas extend beyond the plateau to adjoining habitats.

88. Together the DPPA and the WHEA comprise 12,700ha which covers c. 26% of the Ngakawau Ecological District.

89. The establishment of these areas was not subject to a formal biodiversity offsetting regime using either a biodiversity offset accounting model ('BOAM') or a biodiversity compensation model ('BCM'). To my knowledge there has never been a no net loss standard applied to any mining application on the Buller Coal Plateau. I did construct a limited BOAM for a hydroelectricity proposal by Solid Energy in approximately 2009 which was granted consent, but has never been constructed. If a formal biodiversity regime was applied, as required by the NPS-IB and NPS-FM, I would expect similar or better outcomes.

90. Monitoring indicates that the pest control undertaken by Bathurst has been generally effective at maintaining or increasing bird numbers as demonstrated by five-minute bird counts and annual kiwi call counts. There have been 'winners' (species for

which have increased a lot) and 'losers' (species that have increased slightly, stayed the same or perhaps decreased slightly).

91. Maintaining populations in the wider area is important because it means that there are sufficient individuals to move into rehabilitated areas as they become suitable and this is occurring. For example, bird counts in rehabilitated areas in 2024 were approximately twice what they were in 2021 and more species were present in 2024 than in 2021.

92. There have been some unintended/unforeseen consequences of mammalian pest control. For example, when the baseline surveys for the Cypress Mining Area were undertaken, most *Powelliphanta* snails were detected as shells (rather than live snails), and most had been preyed upon by either rats or possums. Thrushes were also considered a credible threat to *Powelliphanta* snails at the time. More recent surveys have failed to detect any increase in snails as a result of management, and most shells located have been preyed upon by the endemic Western weka (*Gallirallus australis australis*) which appear to be increasing in number as a result of the pest control.

93. With respect to compensation, Bathurst funds the management of 24,000ha in the Heaphy Management Area (Kahurangi National Park). This compensation was agreed as part of the Escarpment Mine permissions, but was not tested against the principles for biodiversity compensation set out in the National Policy Statement for Indigenous Biodiversity and the quantum was arrived at through negotiation between the parties, rather than via a formal calculation (e.g., a BCM). The limited data I have seen indicate that bird numbers in the Heaphy valley have increased since this management began.

RELIEF SOUGHT

94. The amendment sought by Bathurst to Objective ECO-O2 to consider the effects management hierarchy within this policy is appropriate in my view because it recognises that the coking coal is fixed in its location, that the area has high biodiversity values (and would certainly qualify as an SNA), but that those values can be maintained, protected and enhanced if managed appropriately including via the application of offset and compensation.

95. With respect to Policy ECO – P2, the proposed change in wording to include "where the activity has no more than minor adverse effects on the significant indigenous vegetation or fauna habitat" is incongruous to me, because both offsetting and compensation are intended to redress more than minor residual adverse effects and should be contemplated only after steps to avoid, minimise, and remedy adverse effects are demonstrated to have been sequentially exhausted as per the relevant

principles attached to the National Policy Statements. The policy later goes on to state that effects must be managed in accordance with the effects management hierarchy, but this approach is not obviously supported by Objective ECO-O2, which is why I consider that the wording change to ECO-O2 is appropriate.

96. With respect to ECO-P6 I support the change requested by Bathurst to qualify the use of the term 'avoid' with the application of the effects management hierarchy because expansion of existing mining activity could prevent an indigenous species or community being able to persist in their habitats within their natural range in the Ecological District for the period of mining and for some time beyond. In my view proper attention to the effects management hierarchy can (and should) ensure that the habitats are usable again by indigenous species and that the intent of the policy is achieved in a reasonable time frame. The obvious example of this is *P. augusta* where there was no proven methodology for maintaining the species within their known range and in fact, they were unable to persist in their habitats in their natural range for several years, but that situation is now being addressed via return of snails to natural and rehabilitated habitats within and beyond their known natural range (although it is early days in terms of confirming long-term persistence). Another example is the herbfield habitats from Cypress Mining Area – they are not currently persisting in their natural range, but have survived the DT process and persisted outside their natural range for 10 years without losing any species and in fact species diversity has increased in the monitoring plots.

97. In relation to the relief sought by Bathurst, the s42A planning analysis considers that this matter is best dealt with in a separate policy. In my experience at the hearing end of such policies, when I am often asked to interpret the policies for the decision maker, I consider it would be best dealt with in the same policy, otherwise there is a tendency to try and apply it in isolation as a gateway test.

98. I also consider that making the effects management hierarchy explicit in ECO-P8c would be beneficial form an ecological point for view.

99. In regard to Bathurst's further submission on Department of Conservation Submission Point 602.066 in relation to ECO-O2, I note that the Section 42A planning analysis did not support the addition of "and where appropriate restored" because the definition of restoration included in the NPS-IB relates to "modified or degraded" areas and that "this policy relates to significant areas that are unlikely to meet that definition". It is incorrect to assume that significant areas are not "modified or degraded". Ecological significance is a binary assessment (significant or not), and there are a range of factors to be considered, including rarity. It is common for habitats that are rare to be even highly degraded, but still be "the best example" of that habitat and meet the representativeness criterion as well. Such areas would be

considered significant, but may have poor ecological connection or diversity. In my view the inclusion of the words "and where appropriate restored" recognises the intent of the NPS-IB as set out in Section 1.7 (particularly 1.7b which recognises restoration is sometimes necessary).

100. With regard to Policy ECO-P2, the Department of Conservation have sought that the words "and adverse effects are no greater in intensity, scale, or character over time than at the operative date, and do not result in the loss of extent or degradation of ecological integrity" be added. The Section 42A report recommends rewording to "and adverse effects are no greater in intensity, scale, or character over time than at the operative date and do not result in the loss of ecosystem representation or degradation of ecological integrity…" Despite reference to the effects management hierarchy further down the policy, my view is that this wording could effectively make extensions to existing lawful activities a prohibited activity, because such extensions are by definition, greater in scale. Any expansion would result in a loss of representation value, although for common ecosystems this effect may be minor. As I have described in my evidence above, I am of the opinion that the correct application of the effects management hierarchy can address increases in scale and maintain indigenous biodiversity as intended by the NPS-IB.

101. In relation to ECO-P9, the Department of Conservation's further submission on their Submission Point 602.073 suggesting change to the wording of that policy, I agree with the Section 42A report that the wording proposed is unnecessary. The matters covered by the additional wording are already provided in the appendices to the national policy statements.

NATIONAL POLICY STATEMENT FOR INDIGENOUS BIODIVERSITY

102. The objective of the NPS-IB (my highlight) is to maintain indigenous biodiversity across Aotearoa so that there is **at least no overall loss** in indigenous biodiversity after the commencement date; and to achieve this:

(a) through recognising the mana of tangata whenua as kaitiaki of indigenous biodiversity; and

(b) by recognising people and communities, including landowners, as stewards of indigenous biodiversity; and

(c) by **protecting and restoring indigenous biodiversity** as necessary to achieve the overall maintenance of indigenous biodiversity; and

(d) while **providing for the social, economic, and cultural wellbeing of people and communities now and in the future**.

103. The relief sought by Bathurst, which focuses mainly on enabling the proper use of all of the elements of the effects management hierarchy via the relevant objectives and policies, will achieve these outcomes because the coal resources are overlain by very high value habitats which are well understood because of a history of survey and management dating back to the 1990s. There has also been continuous improvement with respect to developing closure criteria and resource consent conditions as they relate to mining and an increase in public expectation that means that poor outcomes are less tolerated. That is not to say that things have been perfectly managed in the past, but a range of effective tools have been developed to assist in biodiversity management across the Buller Coal Plateau and the outcomes of this management have confirmed that these techniques are successful. In general terms they just need to be prioritised and applied more widely and more often which the full application of the effects management hierarchy enables.

CONCLUSION

104. The relief sought in relation to the ecological objectives and policies is appropriate from an ecological point of view. The effects management hierarchy is recognised as international best practice for managing effects and was intended to be implemented in full, rather than piecemeal, subject to the principles which underly offsetting and compensation which were independently developed internationally based on practical experience in settings without legislation similar to the Resource Management Act (which requires effects to be avoided, remedied and mitigated, but not as a hierarchy). Suitable techniques including individual species management, VDT (also known as ‘community translocation’) and landscape scale ecosystem management have proven effective at maintaining particular ecological values at the Buller Coal Plateau and could be applied equally effectively elsewhere. These outcomes have been maintained for up to approximately 20 years at Stockton Mine to date and are expected to be enduring.

Gary Neil Bramley

30 July 2024

APPENDIX 1: LOCATION AND EXTENT OF BULLER COAL PLATEAU

1. Mabin (2012) defined the Denniston Plateau as covering approximately 1,700ha, forming a roughly circular area about 4.5km across as shown in **Figure 1 attached to my evidence**. Most of the Denniston Plateau lies between 600 – 700 metres above sea level (m asl), but it includes c. 280ha which is up-warped to the south (near Mt Rochfort) and a down-warped part covering c. 200ha in the northwest.

2. Templeton and McMorran (2020) identified five areas that they considered formed parts of the Stockton Plateau across a 11.8km stretch between the northern extent of the Denniston Plateau and Stockton Mine. The Stockton Plateau is dominated by a large triangular shaped area of outcropping Brunner Coal Measures within which Stockton Coal Mine is located, but includes smaller areas of outcropping Brunner Coal Measures located around the northern, eastern and southern margins of the larger area. Templeton and McMorran (2020) estimated that the Stockton Plateau covered an area of approximately 3,120ha, being 7.6km long and 4.1km wide, and forming an oval shape between Mt Augustus, the Mt William Range and Mt Stockton. The Stockton Plateau slopes 10° towards the northeast at elevations varying between 860m and 610m above sea level. These areas making up the Stockton Plateau are shown in **Figure 2 attached to my evidence**.

3. The term "coal measures" refers to geological sediments laid down in a depositional environment in which coal can form. Coal measures may, or may not, contain coal.

4. There are three coal measure formations on the West Coast: Late Cretaceous–Palaeocene Paparoa Coal Measures (e.g. Greymouth Coalfield), Eocene Brunner Coal Measures (e.g., Buller Coal Plateau) and Miocene Rotokohu Coal Measures (near Reefton). Coal measures' parent material often develops naturally acidic and infertile soils.

5. Brunner Coal Measures occupy an area of 26,585ha on the northern West Coast of the South Island between Golden Bay and Ross and extending as far east as the Gordon Range (north of St Arnaud). The largest concentration of Brunner Coal Measures occurs on the Buller Coal Plateau, where the acidic geology combines with poor drainage in a cool, wet, and windy environment to create distinctive vegetation communities and exposed gently sloping rock pavements which are known as sandstone erosion pavement or 'sandstone pavement'. The approximate extent of Brunner Coal Measures on the Buller Coal Plateau is shown in **Figure 3 attached to my evidence**.

6. Brunner Coal Measures cover around 3,013ha and 1,648ha at Stockton and Denniston, respectively, where the most extensive vegetation communities on the exposed gently sloping rock pavements are dominated by prostrate shrub and tussock communities. Forests and

shrublands comprising species adapted to infertile environments develop in more sheltered locations, or those with deeper soils, such as hill slopes and deeply incised gorges.

References

Mabin M., 2012. Statement of evidence of Mark Charles Grace Mabin. Prepared for West Coast Environmental Network Incorporated, Royal Forest and Bird Society of New Zealand Incorporated, West Coast Regional Council and Buller District Councils and Buller Coal Limited. Dated 7 June 2012.

Templeton, L., McMorran, T. 2020. Geomorphological Assessment of the Stockton Plateau. Golder Associates.

Figures 1 - 5

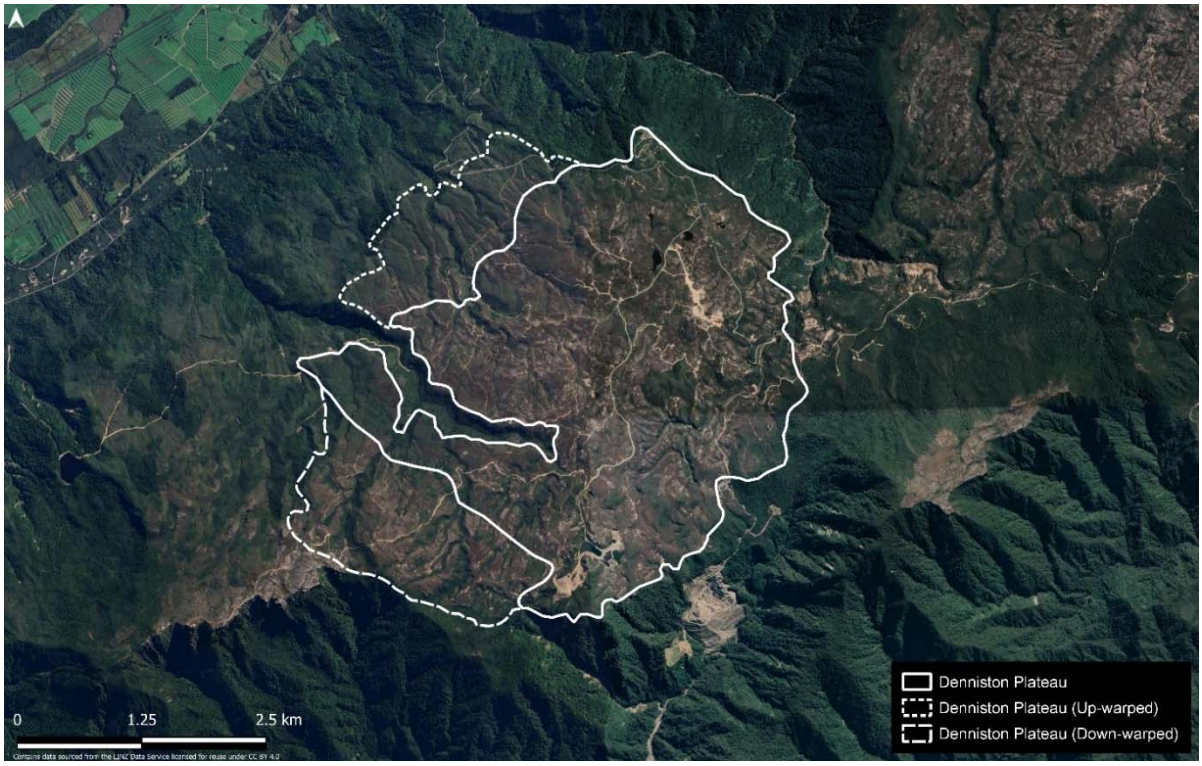

Figure 1: Denniston Plateau as defined by Mabin (2012).

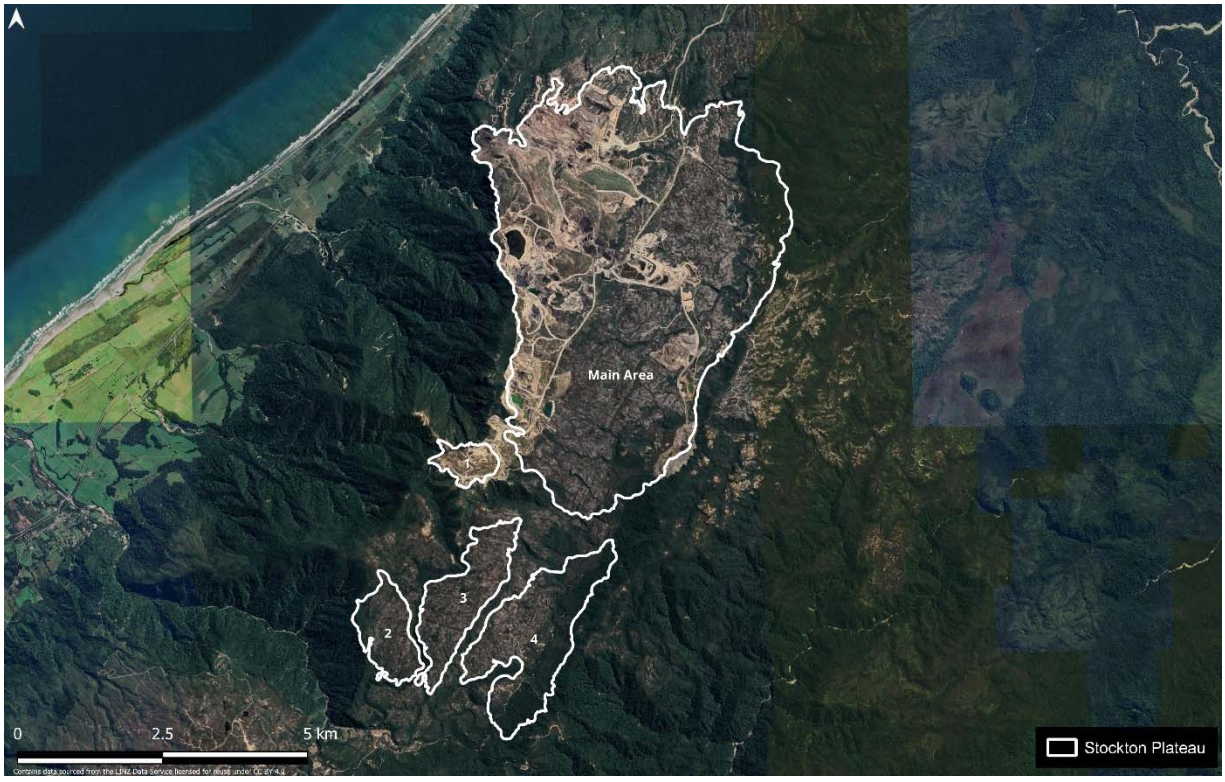

Figure 2: Stockton Plateau as defined by Templeton and McMorran (2020).

Figure 3: Location of the Brunner coal measures on the Buller coal plateau.

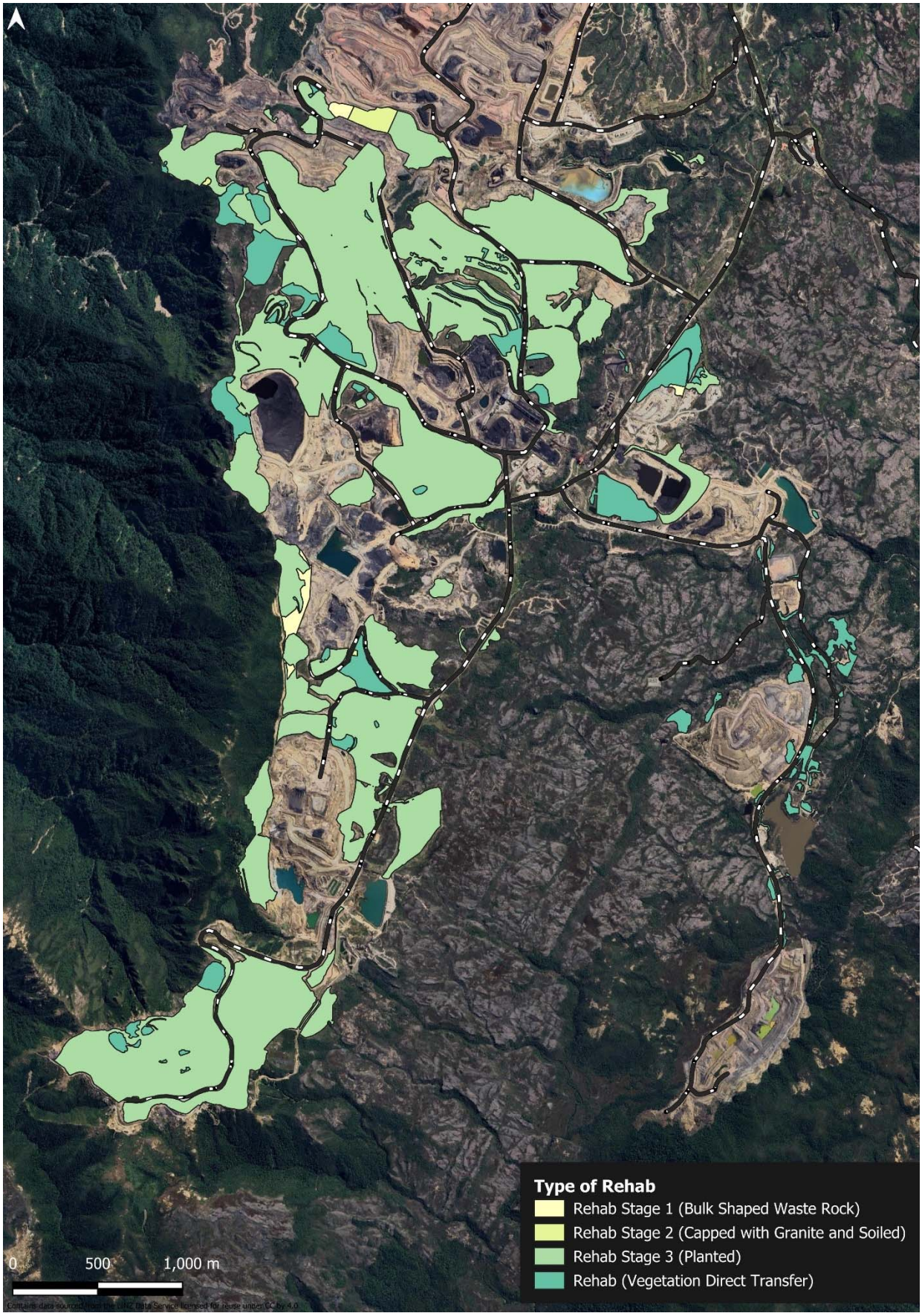

Figure 4: Rehabilitation at Stockton Mine as of June 2024.

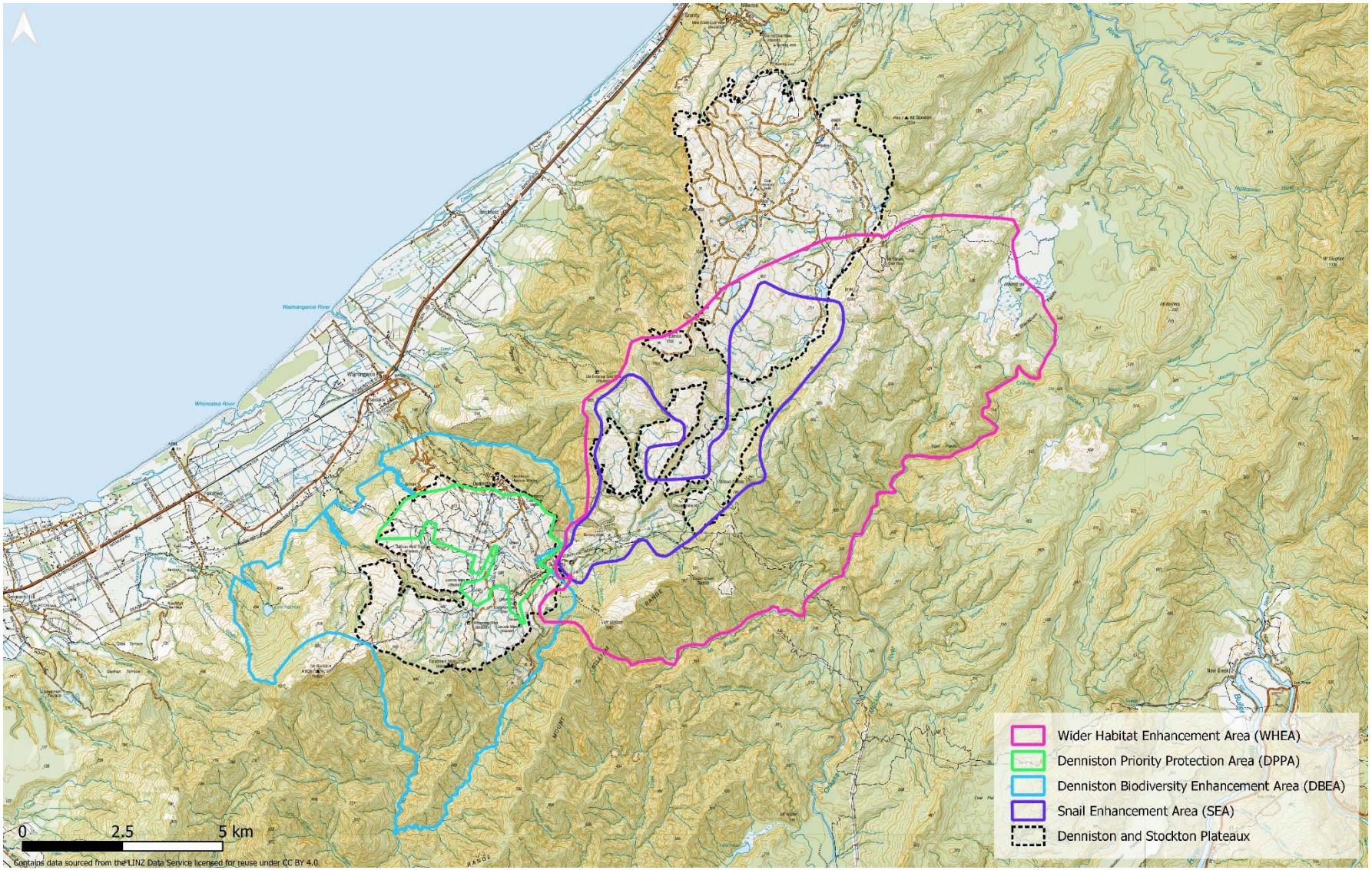

Figure 5: Ecological Management areas at the Buller Coal Plateau.