13 March 2020

To: Indigenous Biodiversity Team
    Ministry for the Environment

Wellington indigenousbiodiversity@mfe.govt.nz

Submitter: Rotokawa Joint Venture Limited

Contact details: Nick Clarke, General Manager – Geothermal and Safety
c/- Miles Rowe
Mercury NZ Limited
PO Box 445
HAMILTON 3240
miles.rowe@mercury.co.nz
Ph: 07 857 0342 or 027 276 2532

SUBMISSION ON DRAFT NATIONAL POLICY STATEMENT FOR INDIGENOUS BIODIVERSITY


RJV supports the intent of the Draft NPSIB as the framework to achieve an integrated and holistic approach to indigenous biodiversity. This requires long term positive actions to manage the ongoing and pervasive threats from vegetation clearance, animal pests and diseases, as well as the emerging threat of climate change. RJV operates a business reliant on the natural renewable energy resources of the Rotokawa geothermal system which also contains areas of indigenous biodiversity reliant on that system. RJV recognises that the sustainable management of these resources would benefit from more integrated national direction.

RJV would appreciate the opportunity to further engage with officials on the information provided and any options under consideration to address the issues raised in this submission.

SUMMARY OF KEY ISSUES

1 This submission outlines the main areas that RJV considers require amendment and/or a change in approach:

   1.1 Inadequate recognition of necessary climate change action: The Draft NPSIB and Discussion Paper are largely silent on the inevitable interaction between the Draft NPSIB, the National Policy Statement for Renewable Electricity Generation 2011 (“NPSREG”) and New Zealand’s domestic climate change policy and international emissions reduction targets. Such silence will inevitably lead to uncertainty, and could result in unnecessary and unhelpful litigation
around what the intended interaction outcome is. RJV considers that it is essential that the Draft NPSIB recognise and seek to reconcile the potential interaction conflicts. RJV considers that the increasing importance of climate change adaptation, mitigation and resilience needs to be specifically provided for in the Draft NPSIB.

1.2 Inadequate provision for renewable electricity generation and its role in climate change action and energy adequacy: RJV is very concerned that strict ‘avoidance’ policies will inappropriately impact on new or existing geothermal electricity generation. The Draft NPSIB as currently drafted is likely to adversely impact renewable electricity generation output and flexibility. There is a need for a bespoke response for geothermal generation. There are unique circumstances for geothermal resources that have been recognised (in the Discussion Paper) as requiring a bespoke solution. RJV agrees and has provided in this submission several ways of addressing these circumstances.

1.3 Over-reaching regulatory impact and lack of reliance on promoting non-regulatory measures: RJV’s fundamental concern with the way the Draft NPSIB is formulated is that it has set the bar too high for the avoidance of effects on Significant Natural Areas (“SNAs”), particularly when combined with the over-reaching application of the assessment criteria for significance and high value. Further, opportunities to apply offset and compensation measures are too constrained. The Biodiversity Collaborative Group set out a number of non-regulatory approaches for incentivising community engagement in ecological restoration and enhancement. RJV considers that many of these measures will be overlooked by landowners and communities given the level of compulsion that has been introduced in the present Draft NPSIB. Tools such as Regional Biodiversity Strategies provide a real opportunity to identify restoration opportunities, and allow communities and public agencies to partner in the practical steps needed to overcome pest plants and animals, and to improve land management to improve the chances of our biodiversity heritage into the future.

2 RJV proposes amendments to the Draft NPSIB in this submission that it considers will more efficiently and effectively achieve its stated aims, while not undermining New Zealand’s low carbon future. The key amendments that RJV considers are vital to address the above concerns are:

2.1 Amendments to give effect to the NPSREG through recognition of climate change targets and responses, and through provisions that enable existing renewable electricity generation activities to continue and for new renewable electricity generation activities to be considered in or near SNA.

2.2 Specific provisions for geothermal resource use to reflect the sophisticated regional policy already in place in the Taupo Volcanic Zone (“TVZ”) and the inability to avoid all effects on geothermal biodiversity when undertaking such activities.

STRUCTURE OF THIS SUBMISSION

3 The remainder of submission is divided into three sections.

3.1 Section A sets out:

(a) Background on RJV and its generation assets;

(b) RJV’s experience and interests in biodiversity management;

(c) The forecast electricity generation demand, national renewable electricity generation targets, and address domestic and international climate change commitments; and

(d) The need for alignment with, and giving effect to the NPSREG

3.2 Section B synthesises the key issues and matters relating to indigenous biodiversity, as summarised in paragraphs 1 and 2 relating to:
(a) Biodiversity effects management;
(b) The implications of the Draft NPSIB on renewable electricity generation; and
(c) Specific issues relating to geothermal ecosystems, and associated geothermal resource use and development.

3.3 Section C provides a detailed table identifying each of RJV’s proposed amendments to the Draft NPSIB. The table includes a ‘red lined’ version of the amendment and brief reasons for each proposed change.

4 In addition, a number of supporting documents have been relied upon to assist in the formulation of this submission. These supporting documents are listed below and referenced, where relevant, in this submission. Copies of these supporting documents are provided as appendices to the Mercury submission.


(c) G Ussher, RMA Ecology Ltd (28 February 2020). NPS Indigenous Biodiversity: review of offset and compensation provisions. This appendix includes a discussion on a more appropriate approach to apply a package of effects mitigation measures to address effects on an SNA. (Refer to Appendix 4 of the Mercury submission)

(d) Boffa Miskell (11 March 2020). Discussion of the Implications of the Draft National Policy for Indigenous Biodiversity for Development. Commissioned by Meridian Energy. This appendix includes a discussion on the lack of distinction between High and Medium value areas as proposed in Appendix 2. (Refer to Appendix 5 of the Mercury submission)

(e) Waikato and Bay of Plenty Regional Policy Statement provisions relevant to geothermal ecosystems and Significant Geothermal Features dealing with effects management. (Refer to Appendix 6 of the Mercury submission)

(f) Mercury letter dated 5 February 2019, to Ministry for the Environment, Indigenous Biodiversity Team. This appendix outlines the background and process for the development of geothermal policy in the Bay of Plenty and Waikato Regions. (Refer to Appendix 7 of the Mercury submission)
BACKGROUND TO RJV AND GENERATION ASSETS

5 RJV is a partnership between Tauhara North No 2 Trust (Tauhara North No 2) and Mercury NZ Limited (“Mercury”). Tauhara North No 2 Trust is an Ahu Whenua Trust who administer and manage 326ha of land, located approximately 15 km north of Taupo and within the rohe of the Ngati Tahu-Ngati Whaoa Iwi. The original 34 shareholders of the Trust were confirmed in a partition order dated 18th March 1913. Today there are over 900 owners and 7700 whanau members looked after by the Trust. Tauhara North No 2 makes use of geothermal resources at Rotokawa and Ngatamariki for energy development and generation.

6 Mercury is one of New Zealand’s largest electricity generators and retailers, providing energy services to homes, businesses and industrial consumers throughout New Zealand. Further background to Mercury is set out in the Mercury submission.

7 RJV generates electricity from the renewable geothermal energy drawn from the Rotokawa Geothermal System. There are two power stations located on the geothermal system, Rotokawa which is a 34.5 MW binary plant and Nga Awa Purua which is a 140MW Fuji electric-Sumitomo net triple flash plant with the largest single-shaft geothermal turbine in the world.

8 Rotokawa Geothermal System is classified as a ‘Development Systems’ in the Waikato Regional Policy Statement and Plan (discussed in more detail below). The steam field associated the two geothermal power plants involve pipelines from a series of production and reinjection wells that draw geothermal water and energy from depths of over 2500m and return it to similar depths.

RJV’S EXPERIENCE IN BIODIVERSITY MANAGEMENT

Geothermal surface feature monitoring

9 RJV undertakes monitoring of geothermal surface features located on the Rotokawa Geothermal System. Surveys were undertaken prior to commencing operations to establish baseline data and any changes are monitored over timeframes at a frequency specified in resource consents or private landowner agreements. Monitoring data is shared with several stakeholders including regulatory authorities, DOC, Iwi and landowners. RJV has supported pest control in the Lake Rotokawa conservation reserve.

10 Mercury and Contact Energy commissioned Wildlands Consultants to advise on the implications of the Draft NPSIB and to record the state of knowledge about geothermal biodiversity in the Taupo Volcanic Zone.\(^1\) It can be seen from their report that there is extensive knowledge about the extent of geothermal biodiversity in the region, acknowledging that scientific inquiry is revealing new things over time.

Biodiversity awareness

11 Tauhara North No 2 and RJV are active as kaitiaki for the biodiversity resources that coexist with their assets. We feel we are well placed to comment on the practical implications of the Draft NPSIB as well as its regulatory impact.
NEED FOR POLICY ALIGNMENT TO MAINTAIN AND EXPAND RENEWABLE ELECTRICITY GENERATION

12 The NPSREG identifies the Government’s 2011 strategic target that 90% of electricity generated in New Zealand should be from renewable energy sources by 2025. Further, the Government has expressed its aspirational goal for 100% of New Zealand’s electricity being generated from renewable sources by 2035 (in a normal hydrological year) provided this does not affect the security of supply.

13 In relation to emissions reduction targets, the Climate Change Response Act includes a binding emissions reduction target that requires New Zealand to have net zero greenhouse gas emissions by 2050, and in the same time period, Transpower estimates that electricity demand will more than double from the current demand. The Interim Climate Change Committee (“ICCC”) concluded that the electricity system is the key enabler of New Zealand achieving its emissions reduction targets through the electrification of transport and process heat.

14 Modelling commissioned by the Productivity Commission suggested that the majority of the increased electricity demand will be met by geothermal and wind generation, and this is likely to see a more than doubling of geothermal generation output from current levels by 2050. To give an idea of the size of this challenge, Transpower has estimated that an additional 2,000 GWh per year of new generation is needed to meet expected demand. This is approximately equivalent to at least two large wind farms the size of Turitea being constructed each year. In addition, all modelling and estimates on future electricity demand assume the continuation of existing renewable electricity generation at current output levels.

15 Currently, geothermal electricity generation represents just under one-fifth of New Zealand’s total generation. However, increasing geothermal generation as envisaged requires a coherent policy framework that consistently supports and places appropriate priority on renewable electricity generation. As more intermittent generation is added to the energy mix (such as weather dependent wind and solar generation), the pressure on the electricity system to meet reliability requirements will also increase. Therefore, the importance of hydro generation for energy storage and security of supply, and geothermal generation for its reliable baseload output, cannot be understated.

16 Under the ICCC’s modelling, assuming no interventions from Government (i.e. business as usual), the electricity market will increase the proportion of New Zealand’s renewable electricity from 82% in 2018 to 92% by 2035. To achieve 100% renewable electricity, the ICCC believe that policy intervention would be required, but these policy interventions are aimed at supporting the electrification of transport and process heat and do not take into account national direction promulgated under the Resource Management Act 1991 (“RMA”). National direction, such as the Draft NPSFM and Draft NPSIB can cut across or compete with other Government objectives and targets, and act as a barrier to the uptake of renewable electricity.

2 NPSREG, Preamble, page 3.


4 Excluding biogenic methane emissions, which have a separate target. See section 5Q CCRA (as amended by the Climate Change Response (Zero Carbon) Amendment Act 2019).


8 Transpower’s modelling assumes retiring of existing (fossil fuel) plant by 2050, which will require replacement generation in addition to new generation to meet increased electricity demand.

9 Interim Climate Change Committee (30 April 2019). Accelerated electrification: Evidence, analysis and recommendations, Table 4.1, page 47. (see web address, footnote 6)

10 Ibid, page 38.

RJV Submission – Draft NPSIB | Page 5 of 18
One of the key issues with existing and draft National Policy Statements under the RMA is that they are not well aligned. Misalignment, or difficulty reconciling the various applicable objectives and policies across the suite of National Policy Statements, can lead to uncertainty, the potential for conflict, and the very real threat of litigation being needed to settle such instances of conflict. These issues decrease the willingness of businesses to invest.

The NPSREG states the following as matters of national significance:

The matters of national significance to which this national policy statement applies are:

a) the need to develop, operate, maintain and upgrade renewable electricity generation activities throughout New Zealand; and

b) the benefits of renewable electricity generation.

Renewable electricity generation is broadly defined in the NPSREG as “generation of electricity from solar, wind, hydro-electricity, geothermal, biomass, tidal, wave, or ocean current sources”.\(^{11}\) We have commented on the benefits for climate change and a secure electricity system above.

Section E of the NPSREG gives specific directions to councils to incorporate objectives, policies and methods to provide for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities into regional policy statements, and regional and district plans. The NPSREG has policies for each renewable energy resource, for example, Policy E4 which relates to Geothermal Resources states:

POLICY E4

Regional policy statements and regional and district plans shall include objectives, policies, and methods (including rules within plans) to provide for the development, operation, maintenance, and upgrading of new and existing electricity generation activities using geothermal resources to the extent applicable to the region or district.

RJV is concerned that policies in the Draft NPSIB appear to clash with, and could inadvertantly override, the NPSREG current measured support for renewable electricity generation, and its contribution towards addressing climate change and emission reduction targets. To that end we welcome this consultation process to confirm how a policy relationship can be achieved that promotes renewable generation activities generally, and for geothermal generation in particular, while achieving appropriate outcomes for indigenous biodiversity. Section C of this submission sets out specific wording suggestions that will assist to address the issue of national policy alignment and how to reconcile any conflicting national policy direction.
IMPLICATIONS OF DRAFT NPSIB FOR RENEWABLE ELECTRICITY GENERATION ACTIVITIES

Managing Effects on SNAs

22 Implementation Requirement 3.9 (1) of the Draft NPSIB largely requires that effects from any new use or development on any SNAs are avoided, for example, where they result in a loss of ecosystem representation and extent, or where they disrupt ecosystem function. Where effects are not of such a scale as to be listed in subclause (1)(a), an effects management hierarchy is to be applied under (1) (b), which commences with the requirement that “adverse effects are avoided where possible” (see definition of ‘effects management hierarchy’ in the Draft NPSIB).

23 Policies containing ‘avoid’ imperatives have been considered by the courts to amount to something of a bottom line and largely require that the relevant activities are not permitted or are prevented from occurring. Consequently, if Implementation Requirement 3.9 (1) were to be incorporated into a final NPSIB in its current form it could result in any activities (including nationally significant activities) being significantly constrained where they may affect a SNA. For renewable electricity generation, this requirement will not just affect new generation activities but also potentially affects both the reconfiguration of existing operations (which is an essential part of the adaptive nature of existing wind and geothermal power development in particular) and the replacement of existing resource consents at the end of their current term in the case of hydro and geothermal development.

24 Given the implications of Implementation Requirement 3.9 (1), there is some consideration given in the Draft NPSIB to ‘nationally significant infrastructure’ via Implementation Requirement 3.9 (2). Generally, activities undertaken by RJV would classify as ‘nationally significant infrastructure’, as defined in the Draft NPSIB, but any renewable electricity generation that is not directly connected to the national grid is not included within the definition (see paragraph (c) of proposed definition for ‘nationally significant infrastructure’). This is at odds with the broad national significance objective of the NPSREG (refer to paragraph 18 above). There are also limitations in Implementation Requirement 3.9 (2) as discussed below in paragraphs 31 and 32.

SNA Criteria and Classification

25 Implementation Requirement 3.9 (2) is restricted to SNAs that are classified as being of ‘Medium’ value under Appendix 2 of the Draft NPSIB. As such the provision potentially has very limited application. Further, the design of Appendix 1 (criteria for identifying SNAs) – which requires that only one attribute needs to be met to reach “significant” status – together with the wording of Appendix 2 of the Draft NPSIB, is such that most SNAs will be rated as ‘High’ value, with no consenting pathway possible, or at best, a non-complying activity with unacceptable consenting risk.

26 Criteria C in Appendix 1 of the Draft NPSIB relates to ‘rarity and distinctiveness’. Wildlands Consultants has confirmed that all geothermal biodiversity would qualify as being rare and therefore as an SNA of ‘High’ value. Therefore, Implementation Requirement 3.9 (2) would not apply in the case of geothermal biodiversity. In addition, it is believed that the majority of existing SNAs in district plans are likely to be rated as ‘High’ value under the Appendix 2 framework.

Effects Management for Renewable Electricity Generation Activities

27 Projects that RJV undertakes have a large footprint, and it is often not possible or practical to design infrastructure in a manner that has no effect on indigenous biodiversity. In reality, nearly all
geothermal projects, connections to the National Grid, and the National Grid itself, have or will have effects on indigenous biodiversity. As a result, the Draft NPSIB in its current form is unlikely to offer a feasible consenting pathway for activities affecting an area identified as a SNA, such that it is likely to prevent the realisation of many renewable electricity generation activities. In other cases, it may lead to smaller renewable electricity generation projects to avoid effects on SNAs, with resulting higher cost per unit of generation. For similar reasons, there is inadequate provision made for existing activities in Implementation Requirement 3.12, including for the maintenance and upgrading of renewable electricity generation.

28 Given the decline in New Zealand’s biodiversity we understand the community desire to arrest that decline and to bring about an improvement in biodiversity, but in our view, the Draft NPSIB does not have the balance right. As noted earlier, RJV has a proven track record in managing its effects on biodiversity and looking for opportunities for ecological enhancement.

29 The formulation of Implementation Requirement 3.9 (2) is similar to Policy 7(g) set out in the Draft National Policy Statement Indigenous Biodiversity recommended by the Biodiversity Collaborative Group in its report dated 25 October 2018 (“BCG Draft NPSIB”). That policy reflected a collaborated outcome that in some circumstances, infrastructure may be constrained due to its functional or operational needs to locate within a SNA.

30 Disagreement arose within the BCG over the inclusion of a provision moderating Policy 6 in respect of nationally significant infrastructure in SNAs of ‘high’ value. That disagreement could not be resolved, and as a result the BCG Draft NPSIB included Policy 7(h) as a non-consensus policy. Policy 7(h) was intended to be confined to activities supported by other National Policy Statements, namely the NPSREG and the National Policy Statement on Electricity Transmission. However, there is no similar provision included in the Draft NPSIB.

31 As noted in paragraph 22, where an effects management hierarchy applies\(^\text{14}\), the first step is that adverse effects are avoided “where possible”. It will always be possible to avoid the adverse effect by declining the project or including constraints or specific requirements that would render the project uneconomic. As a result, the Draft NPSIB includes what is in practice a “no effects” management regime, rather than a true hierarchy. A “where practicable” test would be more appropriate to enable a decision-maker to consider economic and other practical considerations.

32 However, even a “where practicable” test is likely to be a significant barrier for renewable electricity generation projects. For this reason, RJV believes there needs to be a workable consenting pathway for existing and new renewable electricity generation, through amendments to the Draft NPSIB. The specific amendments needed are set out in Section C of this submission, but at a high level aim to:

(a) Provide for renewable electricity generation by recognising the wellbeing, and the health and safety, of people and communities as a cornerstone objective of managing indigenous biodiversity;

(b) Adopt an effects management regime for renewable electricity generation, consistent with section 5 of the RMA, that:
   (i) recognises the functional and operational needs and constraints associated with renewable electricity generation; and
   (ii) provides for the avoidance, remediation, mitigation, offsetting or compensation of adverse effects on SNAs.

(c) Adopt a specific effects management regime for geothermal electricity generation, and any other related use and development of the geothermal resource, that recognises the existing geothermal system classification and effects management framework provided for through the Waikato and Bay of Plenty Regional Policy Statements (“RPS”), where the

\(^{14}\) The application of the ‘effects management hierarchy’ is relevant to managing effects on SNAs (Implementation Requirement 3.9 (1)(b), (2), and (3)), managing activities outside of SNAs (Implementation Requirement 3.13), and when applying biodiversity offsets and biodiversity compensation in accordance with Appendix 3 and 4, respectively.
majority of New Zealand's geothermal resources and geothermal electricity generation are located.

(d) Provide for the continuation of all existing renewable electricity generation at current output levels, where the activities may otherwise have an effect on SNAs.

33 The section below provides detailed discussion on the elements of the Draft NPSIB that affect the use, development and protection of geothermal resources, including for geothermal electricity generation.

GEOTHERMAL ECOSYSTEMS

34 RJV has substantial interests in geothermal power development. It is therefore of significant interest as to how the Draft NPSIB addresses geothermal ecosystems and how these are characterised with respect to their significance.

35 As currently formulated the Draft NPSIB potentially puts existing geothermal power development at risk, and could severely constrain any future development. This would occur if the “avoid” policy is applied to geothermal biodiversity in Geothermal Systems classified as Development in the Waikato RPS and Plan.

36 Implementation Requirement 3.9 (2) provides extremely limited circumstances under which the NPSREG policy direction would rate favourably over the Draft NPSIB direction. In the Draft NPSIB such cases must meet the following: the impact on an SNA has been assessed to be of Medium value and the nationally significant infrastructure activity has a functional or operational need to operate in a particular location and there are no practicable alternative locations and the adverse effects of the activity are, in any event, avoided, remedied, mitigated, offset or compensated for using the ‘effects management hierarchy’ as defined in 1.8 Definitions.

Geothermal Ecosystem Options (Section C.9)

37 RJV is pleased to see that the Discussion Paper includes options to address geothermal biodiversity. The supporting Cabinet Paper\(^{15}\) notes also that an alternative approach to geothermal biodiversity will be required. In this section of our submission we set out reasons as to why we think specific provisions are required to address geothermal ecosystems.

38 Section C.9 provides a discussion on the management of effects on geothermal ecosystems, and there are placeholders in the Draft NPSIB to address the topic of geothermal ecosystems dependent upon the adoption of one of three options in the Discussion Paper. The three proposed options for dealing with geothermal ecosystems are:

(a) Option 1 – the status quo for all geothermal ecosystems, whereby its management would be excluded from the proposed NPSIB. Under this option, geothermal ecosystems would continue to be managed by the relevant RPS and plans.\(^{16}\)

(b) Option 2 – the status quo only for geothermal ecosystems within the TVZ, whereby its management would be excluded from the proposed NPSIB, but all other geothermal ecosystems (outside the TVZ) would be managed by the proposed NPSIB. Under this option, geothermal ecosystems within the TVZ would continue to be managed by the RPS and plans applying to the Waikato and Bay of Plenty regions.\(^{17}\)

(c) Option 3 – a specific framework in the proposed NPSIB applying to all geothermal ecosystems. This option would require yet-to-be drafted provisions for the proposed

\(^{15}\) Cabinet Paper (November 2019). Recommendation 6 and paragraph 40.

\(^{16}\) Discussion Paper, page 60.

\(^{17}\) Ibid, page 61.
RJV’s position is that all three options could be made to work. However, as discussed in the sections below, Option 1 is the simplest and easiest option to implement, whereas Option 3 would require complex provisions that will need to be carefully considered.

Discussion on Geothermal Ecosystem Options

Option 1 has the advantage that it would not undermine the existing well-developed management frameworks that are in place for managing adverse effects on geothermal ecosystems. The management frameworks are similar in the Waikato and Bay of Plenty RPS’s, but in the absence of national direction for managing geothermal ecosystems, the regional approaches in the Waikato and Bay of Plenty may differ in the future, as well as in regions with Geothermal Systems outside the TVZ.

Option 2 has the same advantages and disadvantages as Option 1 with respect to geothermal ecosystems in the TVZ. Other Geothermal Systems outside the TVZ would be managed through the NPSIB, which would result in geothermal ecosystems (outside the TVZ) being managed in the same way as for all other terrestrial indigenous biodiversity.

Under Option 3, Geothermal System classification would be required at a regional level consistent with the TVZ approach, based on level of use - development or protection. Management of habitats would be as appropriate to the system classification. Development Geothermal Systems would have a policy approach of remedying or mitigating significant adverse effects (i.e. the “avoid” policy, which is not possible to achieve, would not apply). Offsets and environmental compensation may be applied. This reflects the current approach in the Waikato and Bay of Plenty Regions. Limited Development Geothermal System (in the Waikato region) and Conditional Development Geothermal System (in the Bay of Plenty region) have slightly different effects management approaches under the respective RPS’s, but are broadly similar in principle in that the focus is on remedying or mitigating effects associated with changes in heat flux and fluid flow, but seeks to minimise surface effects (e.g. site works on high value habitats). However it will be necessary to consider this in more depth for any future development in such systems. For other systems (e.g. Protected and Research) an effects management hierarchy would apply.

In the following sections of our submission we:

(a) Identify the serious potential implications of the Draft NPSIB on existing and new geothermal electricity generation and development activities should one of Options 1 to 3 not be implemented;

(b) Outline the extent to which each of the Draft NPSIB options supports current regional geothermal resource management approaches applied in Waikato and Bay of Plenty Regions;

(c) Describe and provide evidence regarding the development of those regional geothermal resource policies, including commentary on how they have been assessed, applied and received; and

(d) Affirm that it is essential and appropriate that the Draft NPSIB either:
   (i) exclude geothermal biodiversity from its scope as proposed by Options 1 or 2, or
   (ii) include specific provisions that reflect the existing regional geothermal resource approach as intended by Option 3.

In Section C, RJV provides suggestions as to how the three geothermal ecosystem options could be implemented in the Draft NPSIB.
The great majority of geothermal resources in New Zealand are concentrated in the TVZ within the Waikato and Bay of Plenty regions. There is some geothermal activity beyond the TVZ but such activity produces features that are smaller in area, a smaller range of features and are more isolated. The Ngawha system in Northland is the other notable Geothermal System developed for geothermal power.

Both Waikato and Bay of Plenty Regional Councils have made a significant investment in developing inventories of surface expressions of Geothermal Systems in their regions. Further information has been provided through surveys and monitoring undertaken for major resource users on systems classified as Development.

There have been extensive assessments undertaken of geothermal surface features and their associated biodiversity values. This is described by Wildlands and provides clear evidence that geothermal ecosystems have been extensively reported on against well-developed criteria contained in the Waikato and Bay of Plenty RPS’s. It is hard in our view to justify further national intervention on this issue given the level of well-developed management already evident at a regional level.

For the reasons set out below any reference to ‘avoiding’ effects is particularly problematic when dealing with geothermal ecosystems as the significance assessments provided in the Draft NPSIB are likely to result in almost all geothermal biodiversity being assessed as a ‘High’ value SNA. Further, the effects management approach adopted for renewable electricity generation activities in the Draft NPSIB is not well suited to the way regional councils (particularly those who have regions where there is greater use of existing geothermal resources, such as Bay of Plenty and Waikato) have developed policy for geothermal resources necessitating, in our view, a specific approach to address that circumstance.

The approach to regional resource decision making for geothermal ecosystems is well developed and has been through extensive Environment Court processes and testing to confirm its appropriateness. Geothermal regional policy planning is well advanced, noting that the NPSREG requires provision to be made for the use of geothermal energy resources through regional policy instruments. The level of protection, use and development applicable to each Geothermal System should continue to be determined at the outset through the process of classifying Geothermal Systems. Further comment is made on this in following sections. As drafted, the Draft NPSIB fails to include the ‘regional resource’ decision-making step that is required when dealing with geothermal energy resources and associated geothermal ecosystems. In RJV’s submission the system classification approach appropriately reflects sustainable management of geothermal resources in the context of section 5 of the RMA.

More specifically, there is an ‘effects management’ process applicable to Development Geothermal Systems, which is based on being able to remedy, mitigate, offset or compensate for significant adverse effects. Of importance is that the regime also provides for the full protection of Protected Geothermal Systems and the significant features and habitats found within. The BCG Draft NPSIB

---

21 See Policy E4 of the NPSREG, as noted in paragraph 20 of this submission.
22 See RPS Chapter 9 and Waikato Regional Plan Chapter 7; Bay of Plenty RPS Policy GR 1A and Table 12.
included a non-consensus policy (Policy 7(i))[^23] which provides for an effects management approach applying to the geothermal resource management regime applicable to systems where development is anticipated. RJV's submission is that a similar provision should be inserted into Implementation Requirement 3.11 in the Draft NPSIB (refer to Section C).

51 It is crucial that the Draft NPSIB is formulated in such a manner that both appropriate use and development is enabled, and the level of protection afforded to geothermal surface features is retained, in the manner provided for in current regional policy for the Waikato and Bay of Plenty regions.

52 The alternative to this would be to exclude geothermal ecosystems altogether, as proposed in Option 1 or in Option 2 with respect to the TVZ. The justification for excluding geothermal ecosystems from the Draft NPSIB is that Geothermal System utilised for development purposes are largely confined to three regions of NZ (Waikato, Bay of Plenty and Northland) and those regions have developed, longstanding, well-regarded and heavily scrutinised planning approaches to ensure that geothermal biodiversity is appropriately managed.

Classification of Geothermal Systems

53 In the Waikato and Bay of Plenty regions, decisions have been made as to the level of protection, use and development that is appropriate for the regional geothermal resources of the TVZ. This characterisation of each geothermal system was a fundamental first step before the consideration of how effects are to be managed.

54 All major geothermal systems are ‘classified’ in the Waikato and Bay of Plenty RPSs or plans as one of:

- Protected
- Research
- Limited or Conditional Development
- Low temperature
- Rotorua, or
- Development.

55 Both Waikato and Bay of Plenty Regional Councils have put significant effort into the classification system approach and the development of policy for geothermal resources in their regions. The creation of geothermal policy in both regions involved extensive council hearing and Environment Court processes, including mediations, and has been proven over many years to work well in practice.


> Despite Policy 6, where activities referred to in [Policy 7(h)(ii)] are undertaken in an identified geothermal system and have an adverse effect on a significant natural area comprising indigenous species and habitats that have a geothermal association, such activities shall be managed so as to:

1. remedy, mitigate, offset or compensate for significant adverse effects on such species and habitats in geothermal systems classified as ‘Development’ in a regional policy statement or plan.
2. avoid where practicable, or otherwise remedy, mitigate, offset or compensate for significant adverse effects on such species and habitats in geothermal systems classified as ‘Conditional Development’ in a regional policy statement or plan.
3. avoid significant adverse effects on such species and habitats in geothermal systems classified as ‘Limited Development’ in a regional policy statement or plan, and remedy, mitigate, offset or compensate any other adverse effects.
Northland is the other region with a developed high temperature geothermal resource, however it does not have a classification system.

Regional Geothermal Resource Policy

Both the Waikato and Bay of Plenty RPS’s use sustainability over time and renewability as measures to determine the appropriate classification, which in turn determines the appropriate level of use, development or protection of a Geothermal System. Use and development to varying degrees is contemplated in some Geothermal Systems, being those classified as Development, Conditional Development, Limited Development, Low Temperature and Rotorua. As Geothermal Systems are dynamic and changes will occur over time, the regional policies provide for adaptive management approaches to the use of geothermal resources. Development Geothermal Systems are those which, among other criteria, have few areas of geothermal vegetation that are particularly vulnerable to adverse effects from development.

Modern geothermal energy extraction and reinjection technologies have the primary goal of sustaining the heat output capacity of each geothermal reservoir. As such, adverse effects on surface features are managed, but complete avoidance of all effects is not possible. Sustainable use under the regional policies involves an alignment of commercial imperatives (significant investment, long term outlooks akin to sustainability) and kaitiakitanga (providing for current and future generations).

The regional policies provide for the use of system management plans and discharge strategies to engender and ensure that there are proactive interactions between geothermal users, regional councils and their peer review panels. Resource consent conditions commonly provide for extensive monitoring and reporting requirements on geothermal surface features and vegetation, underlying heat flows and system temperatures, which can trigger intervention and further mitigation or remedial effort if found to be necessary.

Significance of Features and Criteria for Significance

Under the current Waikato and Bay of Plenty RPS’s and regional plans, geothermal features are assessed by to determine those that are are significant. In the Bay of Plenty Region, geothermal features are assessed using criteria in Appendix F Set 7 “Geothermal Features” of the Bay of Plenty RPS, in conjunction with a very comprehensive descriptive annex to the definitions, for geothermal features. In the Waikato Region, ‘geothermal feature types’ are assessed against the criteria in Section 9B of the Waikato RPS. Both sets of criteria cover a wide range of factors, including geothermal biodiversity values.

In both regions, an appropriate/inappropriate development test applies to geothermal features, and geothermal vegetation and habitat is differentiated from geothermal features and other terrestrial vegetation. It is recognised that geothermal systems are dynamic and surface features change over time.

There is a question as to whether SNA criteria should apply at all to the management of significant geothermal features given the specific inclusion of biodiversity values in the Significant Geothermal Feature criteria. There would be unnecessary duplication and confusion for an ecologist to have to undertake an assessment under both the Draft NPSIB Appendix 1 criteria and the more specific regional criteria that has been developed for geothermal features. The outcome may not be that different, as all geothermal biodiversity is likely to be considered to be significant and ‘High’ value.
The obvious way to resolve this issue is to rely on the regional processes and is one of the clear advantages of Option 1.

Distinctions are also made between the use of geothermal energy and land use activities that may have a direct effect on surface features and geothermal vegetation. The latter is rigidly controlled. There is a need for provisions to be included in Option 3 to deal with this.

Significant geothermal vegetation is identified and mapped for Development and Limited Development Geothermal Systems in the Waikato Regional Plan. For other Geothermal Systems, Significant Geothermal Features maps are provided publicly but are not in the Plan. There is extensive information available of geothermal features in the Bay of Plenty region, but as yet, it does not reside in a regional plan.

Compatibility with the Draft NPSIB Significance Criteria

The Draft NPSIB will require an assessment to be carried out to confirm the biodiversity elements against the new SNA criteria in Appendix 1 of the Draft NPSIB. The indigenous ecosystems of geothermal areas possess high conservation and scientific values. The combination of high temperatures and stressful environmental chemistry means that some species of vegetation have adapted to thrive in these conditions. Many of these indigenous species have evolved for, and only live, in geothermal habitats. For this reason, and the natural scarcity of suitable environments, geothermal ecosystems are nationally rare and uncommon and all are likely meet the Draft NPSIB Appendix 1 significance criteria, as well as being of ‘High’ value SNAs through the Appendix 2 framework.

Wildlands undertook a review as to whether the sets of criteria in the respective RPSs are compatible with the Draft NPSIB Appendix 1 criteria, and if any ambiguity would arise. Wildlands also considered the expertise applied to the development of the RPS criteria and the merits of continuing to reference and use the geothermal criteria when identifying an SNA (to the extent they are applicable).27

Wildlands concludes:28

Application of the NPSIB criteria to geothermal sites in the Bay of Plenty and Waikato Regions is likely to result in an identical suite of sites being identified as being ecologically significant. This is because geothermal sites are nationally uncommon (only c.1,000 hectares remain, in total), and most sites will trigger the NPSIB criteria for representativeness, diversity and pattern, and rarity and distinctiveness, along with ecological context.

Further:29

Comprehensive assessments of the ecological significance of geothermal vegetation and habitats have been undertaken widely across the Bay of Plenty and Waikato Regions. These have been undertaken using geothermal-specific criteria provided in the Bay of Plenty RPS and Significant Geothermal Features are also defined in the Waikato RPS. A set of geothermal-specific criteria has also been developed for the evaluation of biodiversity management priorities at geothermal sites in the Waikato Region. There is long-standing recognition that evaluation of geothermal features requires a geothermal-specific approach.

27 Ibid, Section 4 and 5.
29 Ibid Section 9 Conclusions, page 23.
Compatibility with the Draft NPSIB Assessment Framework: Taupo Volcanic Zone vs Ecological Districts

68 The Draft NPSIB’s use of standard ‘ecological districts’ as the framework for significance assessment is problematic in the case of geothermal biodiversity. As noted above, geothermal vegetation and habitats only exist because of subsurface geothermal activity, and its scale and character. For example, the geothermal vegetation of the Wairakei-Tauhara Geothermal System, located near Taupō, falls within two ecological districts which have no bearing on the nature of this geothermal vegetation. Because the substrate defines the vegetation, the relevant ecological “district” for the purpose of assessing geothermal biodiversity should be the geothermally altered landscape. In the central North Island, this is the TVZ.

69 Consequently, to ensure the assessment of geothermal biodiversity reflects the appropriate significance of a site, Wildlands sets out the background and reasons as to why the TVZ is the appropriate framework for the evaluation of geothermal vegetation and habitat. It is therefore recommended that the TVZ should replace ecological districts as the appropriate framework used for flora and fauna assessment associated with environments that are subject to a geothermal influence.

70 In this situation, the significance criteria would still be applied, using the relevant topographical, geological, climatic, soil and biological features, and the broad cultural pattern. However, as geothermally altered geology is the principal factor for these unique lifeforms, this sets the framework for consideration of the other factors listed above.

71 To implement the necessary change in the Draft NPSIB to respond to the concerns regarding geothermal significance assessment, the definitions for ecological districts as currently set out in Clause 1.8 Definitions and Appendix 1 to the Draft NPSIB should be amended, as well as a new definition for ‘Taupō Volcanic Zone’. (Refer to Section C for specific changes)

How it Works in Practice: Waikato and Bay of Plenty Regions

72 Resource consent conditions implement RPS and plan requirements for System Management Plans and peer review panels which are in place for most (if not all) Geothermal Systems where geothermal power development is operational. These plans include a wide range of matters, but for current purposes, it is sufficient to say they have a focus on the sustainable management of geothermal reservoirs and management of land surface effects. There is also a well-established practice of geothermal power development companies monitoring geothermal surface features and vegetation.

73 While sustainability of the resource is a primary focus of geothermal operators, it is not possible or practical to operate a geothermal power station by avoiding all effects on geothermal biodiversity, as pressure and temperature changes within Geothermal Systems are an inevitable by-product of geothermal electricity generation. Some of the reasons for this are explained by Wildlands, including that:

(a) Older geothermal extraction technologies have resulted in effects on geothermal surface features, but modern technologies have a much lower impact on surface features and may not result in any detectable changes;

(b) Some effects of geothermal fluid abstraction may not be exactly predictable, so it may not be possible to anticipate exactly what will occur;
Minor effects which may occur, or which can possibly occur, can be addressed through monitoring, mitigation, compensation and offsetting; and

It is likely to be impractical to achieve ‘like for like’ mitigation or biodiversity offsets for geothermal biodiversity in the sense contemplated in Appendix 3 (5) of the Draft NPSIB.

In addition, geothermal features are naturally transient and changes as a result of use of the resource are sometimes difficult to distinguish from natural changes. Monitoring of surface features is an integral part of consented geothermal development to detect changes over time and take corrective action if required.

Addressing Biodiversity Effects in Geothermal Developments

To realise the necessary utilisation of New Zealand’s geothermal energy resources and to appropriately manage geothermal biodiversity, the full suite of effects management approaches including offsetting and environmental compensation should be available. Each situation will need to be assessed to appropriately manage surface expressions of the geothermal resource and the geothermal reservoir. As noted, it is unrealistic to avoid all effects of geothermal electricity generation on geothermal biodiversity, but there are a range of strategies that can be employed to minimise effects or to offset or compensate for those effects.

Wildlands has observed that the most significant detrimental effects on indigenous biodiversity are often from non-consented impacts or activities, such as from invasive weed and pest species, fire, landowner clearance, stock grazing, recreational activities, urban encroachment, and other direct impacts. Wildlands has further observed that “considerable effort is now being applied to obtain a better understanding of site character and management requirements.”

Wildlands has observed that the most significant detrimental effects on indigenous biodiversity are often from non-consented impacts or activities, such as from invasive weed and pest species, fire, landowner clearance, stock grazing, recreational activities, urban encroachment, and other direct impacts. Wildlands has further observed that “considerable effort is now being applied to obtain a better understanding of site character and management requirements.”

Wildlands also concludes that:

Given the better understanding and application, of modern technology to sustain geothermal fluid reservoirs and surface features, combined with an improving understanding of geothermal site condition and management requirements, there is ongoing potential for increased active management to sustain geothermal vegetation and habitats across their full extent.

Summary on Geothermal Ecosystems Options

Wildland noted that, in relation to the proposed rigid effects management approach in Implementation Requirement 3.9, that:

The need to avoid is a strong test, and is a high level of protection, and would in most cases be interpreted to mean that a potential development could not be undertaken if any of the listed adverse effects were to occur, on any scale, or there was even a possibility that an adverse effect could occur.

34 Ibid, Section 7, page 19.
36 Ibid, Section 9 Conclusions, page 23. Refer to Appendix 2.
37 Ibid, Section 8, page 21. Refer to Appendix 2.
One of the overall conclusions of Wildlands is that:\[38\]

Current provisions in the relevant statutory plans for the Waikato and Bay of Plenty Regions are designed to protect geothermal features and to retain them in a healthy state. Current plan provisions are more nuanced than the proposed NPSIB, and have been developed based on careful consideration of the relative values of various geothermal sites, current knowledge, and potential effects.

It is for these reasons that there is a need for a suitable geothermal policy that enables the current practice and policy that is in place, respects iwi right and interests, allows for existing uses, and aligns with the NPSREG. The options to achieve this outcome are:

81.1 **Option 1 (exclude all geothermal biodiversity)** would retain the currently highly effective geothermal policy that is in place in the Bay of Plenty and Waikato regions, and incorporating the TVZ. The benefits of retaining this policy framework are that it provides for the protection of geothermal biodiversity in appropriate areas and allows for use and development in appropriate ways. The sustainable contribution made by geothermal energy to New Zealand’s renewable electricity generation could continue and future use and development of geothermal resources could be considered using the robust regional framework for decision-making. It would not be hard for the few regions that have geothermal biodiversity outside of the TVZ (Northland and West Coast) to adopt a similar policy framework for their regions. The Draft NPSIB could enable those Councils to opt in or out of the Draft NPSIB provisions.

81.2 **Option 2 (exclude geothermal biodiversity in the Taupo Volcanic Zone)** would have the same advantages as Option 1 and would address the issues of most concern to RJV in the TVZ. However, it would also mean that Councils may have to duplicate some work as systems currently managed through the geothermal policy in the Waikato and Bay of Plenty policy but located outside the TVZ would have to be reassessed under the Draft NPSIB. There seems little benefit in this, and significant potential costs to participants.

81.3 **Option 3 (include geothermal specific provisions in the NPSIB)** is the more difficult option to implement due to the need for numerous additional or amended provisions in the Draft NPSIB. However, it would have the potential advantage of creating some certainty for the use, development or protection of geothermal resources, including setting out how to manage geothermal biodiversity in such circumstances. The acceptability of this option depends on the extent to which it can enable the current policy operating for the TVZ and, more particularly, the manner in which it deals with systems that are classified as Development, Conditional Development and Limited Development Geothermal Systems. Geothermal System classification have considerations that are broader than geothermal biodiversity and the Draft NPSIB may not be the best instrument to set out such national direction. Equally, the Draft NPSIB has such significant implications for geothermal resource use that it would be remiss not to address the issue.

81.4 Where Option 3 is preferred, the changes needed to the Draft NPSIB are complex, and if not carefully considered and drafted could have significant implications for the geothermal industry and Geothermal System users. In Section C, RJV has offered a number of ways that this might be achieved but we acknowledge that further changes or consequential amendments may be necessary. In the absence of a Board of Inquiry process to consider and hear submissions on the matter, RJV recommends that further engagement is undertaken with geothermal users and generators, and relevant regional councils on any final proposals for Option 3.

---

RJV has been advised that there would be very few large-scale development proposals for renewable electricity generation activities that would not be inhibited by the Draft NPSIB policies. RJV is in favour of taking a responsible approach to biodiversity management and aspires to doing the right thing. A policy which does not allow consideration of a package of proposals including measures to remedy, mitigate, offset or compensate significant adverse effects seems unrealistic and preclusive of opportunities to consider improvements for biodiversity. There is a real risk that New Zealand will not be able to transition to a low carbon economy should the current Draft NPSIB be adopted. Changes made to the approach recommended by the Biodiversity Collaborative Group have shifted the balance toward a rigidly regulated approach which will discourage communities from engaging in biodiversity enhancement projects to the detriment of making progress on arresting biodiversity decline. Accordingly, RJV asks that its suggested amendments be carefully considered.