



**FIORDLAND LINK MONORAIL**

ASSESSMENT AGAINST STATEMENT OF OUTSTANDING UNIVERSAL VALUE

TE WAHIPOUNAMU WORLD HERITAGE AREA

**EFFECTS ON LANDSCAPE VALUES**

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## INTRODUCTION

This report assesses the effects of the proposed Fiordland Link Monorail on landscape values described in 'Te Wahipounamu Statement of Outstanding Universal Value'.

It also recommends measures that might be taken to fulfil the 'management and protection' requirements of a World Heritage Area.

The report is based on a site visit (27 March 2013) and a review of documents including:

- Fiordland Link Experience, Monorail Terminal buildings for Kiwi Burn and Te Anau Downs, Salmond Architecture, July 2009
- Fiordland Link Experience, Landscape Effects Report, Stephen Brown Environments Ltd, August 2009
- Fiordland Link Experience, Department of Conservation Concession Application, Mitchell Partnerships on behalf of Riverstone Holdings Ltd, 4 November 2009
- Fiordland Link Monorail, Landscape Audit, Morgan and Pollard (Wildland Consultants), 1 May 2010
- Fiordland Link Experience, Response to Department of Conservation Audit Reports, Mitchell Partnerships on behalf of Riverstone Holdings Ltd, September 2010
- Monorail and Mountain Bike Track 'Fiordland Experience', Officers Report to Decision Maker, Department of Conservation, 1 December 2011
- Te Wahipounamu Statement of Outstanding Universal Value, UNESCO World Heritage Centre, <http://whc.unesco.org/en/list/551>, retrieved 18 March 2012

## DESCRIPTION OF PROJECT

In summary the monorail project comprises the following main elements:

- An eastern terminus on river terraces near Mavora Lakes Road opposite the mouth of the Kiwi Burn valley;
- A western terminus at Te Anau Downs adjacent to the 'Fiordland National Park Lodge';
- A monorail mainly through a mixture of native forest and open grassland aligned as follows (east to west):
  - Upstream along lower section of Kiwi Burn valley (from the Mararoa River) and up a tributary north-west of Kiwi Burn Hut, crossing a saddle to tributary of the Whitestone River;
  - From the Whitestone River tributary to the Whitestone River by way of a saddle and minor tributary east of Limestone Hill. Crossing the Whitestone River by bridge, then downstream on the true right bank for approximately 2km, and up a major tributary to a saddle to a tributary of the Upukerora River (Ascension Creek);
  - From Ascension Creek to the Upukerora River where it will emerge onto a viaduct that will loop over the river and return to the true left bank. Continuing downstream for approximately 4km, including a section on

forested river terraces on the true left bank, a bridge over the river, an open section on terraces at the mouth of Dunton Swamp, and a forested section around an area known as Upukerora Bluff. Continuing across a low watershed to a headwater tributary of Henry Creek;

- Across rolling farmland outside the Conservation Estate, around the perimeter of the Henry Creek catchment, to Te Anau Downs.
- The monorail will comprise a concrete beam approximately 1m deep supported on pillars. The beam is intended to follow close to the ground surface with pillars a minimum 1m high (above ground level) increasing up to 6m in height to accommodate variations in topography and stream crossings;
- A 3m wide construction and service track. The track is to be separate from the monorail by a distance averaging in the order of 50m (between roughly 20m and 80m depending on terrain) and connected by spur tracks at approximately 200-300m intervals;
- Retention of the construction track once the monorail is operational for maintenance purposes, and also to be used as a cycle track, forming part of a route from Lake Wakatipu to Te Anau; and
- A section of cycle-track is to be independent of the monorail between the Upukorero valley and Te Anau Downs.

Some 29.5km of the total 43.5km monorail corridor will be on conservation estate, almost all falling within the Snowdon Forest Conservation Stewardship Area which forms part of Te Wahipounamu World Heritage Area. Te Anau Downs terminus will also be just within Fiordland National Park (and therefore the World Heritage Area).

### **TE WAHIPOUNAMU 'STATEMENT OF OUTSTANDING UNIVERSAL VALUE' (SOUV)<sup>1</sup>**

Places (or properties<sup>2</sup>) inscribed on the World Heritage List must meet the requirement for outstanding universal value, which is described in the World Heritage Conventions Operational Guidelines. To be considered of outstanding universal value a place needs to:

- Meet one or more of the ten criteria
- Meet the conditions of 'integrity'
- Have an adequate system of protection and management to safeguard its future.

(If it is a cultural property it must also meet the conditions of 'authenticity', although that is not relevant to Te Wahipounamu).

### ***Criteria for determining Outstanding Universal Value***

The ten criteria in the guidelines cover both cultural and natural value. Te Wahipounamu SOUV claims outstanding value under all four criteria that relate to natural values as follows:

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<sup>1</sup> Attached as Appendix 1

<sup>2</sup> Or 'properties' in the terminology of the World Heritage Conventions Operational Guidelines

<i>Criterion vii</i>	<i>Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance</i>
<i>Criterion viii</i>	<i>Be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features</i>
<i>Criterion ix</i>	<i>Be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals</i>
<i>Criterion x</i>	<i>Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation</i>

The descriptions in response to these criteria in Te Wahipounamu SOUV can be paraphrased as follows:

*Criteria viii*

- Contains many of the natural features which contribute to New Zealand's reputation for superlative landscapes (the highest mountains, longest glaciers, tallest forests, wildest rivers and gorges, most rugged coastlines, deepest fiords and lakes...);
- World's best temperate rainforest in terms of extent, intactness and composition;
- Vast wilderness and spectacular mountains;
- World class primeval scenic beauty; and
- Only traces of human influence, and then mainly in peripheral areas.

*Criteria viii*

- Best example of Gondwana taxa as represented in modern ecosystems; and
- Outstanding example of Pleistocene glacial history (geomorphology).

*Criteria ix*

- Continuums of largely unmodified habitats;
- High degree of geodiversity and biodiversity;
- Notable examples of dynamic on-going plant successions and environmental gradients;

*Criteria x*

- Extensive range of New Zealand's unusual endemic fauna (particularly rare and endangered takahe, brown kiwi, rowi, mohua, kaka, kakariki, pateke).

### ***Condition of Integrity***

Integrity relates to the 'wholeness' and 'intactness' of the place and how it 'conveys its values'. In other words, integrity covers both actual intactness and perceptions of intactness.

The aspects underpinning integrity as described in Te Wahipounamu SOUV can be paraphrased as follows:

- Complete 'mountains-to-the-sea' and 'mountains-to-inland basins' landscape sequences;
- Full range of Pleistocene-modern glacial erosion and deposition landforms;
- Largely in its natural state (the 10% of New Zealand least disturbed or modified);
- Nearly contiguous network of reserved land, the boundaries of which are closely aligned with the area's main features;
- Extraordinary range of landform, soil, vegetation, latitude, altitude and rainfall gradient sequences.

The SOUV also identifies the following threats to integrity:

- Introduced pests and predators;
- Effects of global warming on icefields and glaciers; and
- Pressure from tourism at the main tourist attractions.

### ***Protection and Management***

The matters relating to protection and management requirements in Te Wahipounamu SOUV can be paraphrased as follows:

- Crown ownership (with one small exception);
- Legal protection as National Park or Reserve and associated Acts;
- Management by the Department of Conservation and its legislative mandates and requirements;
- Planning documents such as national park management plans, and a management structure that includes a single manager overseeing the World Heritage Area;
- The particularly high natural values which lead to priority being given to management of such values.

The SOUV also identifies the following challenges to protection and management:

- Impacts from tourism at key sites; and
- Impacts from introduced species

The SOUV states that these impacts are being addressed by management actions and continue to be a concern. It also states that traditional resource use by Maori is closely regulated but does not result in significant impacts.

## EFFECTS ON LANDSCAPE VALUES IDENTIFIED IN THE SOUV

This report assesses the effects in two parts:

- Effects on the landscape values in the monorail corridor; and
- Effects of a monorail on the overall 'integrity' of the World Heritage Area

### Effects in Vicinity of Monorail Corridor

This part is further divided to address the following three components which have quite different geographic contexts:

- a) Eastern (Kiwi Burn) terminus;
- b) Western (Te Anau Downs) terminus; and
- c) The monorail through Snowdon Forest

#### ***Eastern (Kiwi Burn) Terminus***

The eastern station is located in an open landscape on a terrace above the Mararoa River. The valley is farmed as part of high country pastoral stations. The terminus site is approximately 1km downstream of Hikuraki Station homestead, is nearby to a woolshed, stockyards and shelter belt, and is a short distance from Mavora Lakes Road which runs along the valley.

The proposed site replaces one previously proposed in a more sensitive location approximately 2km to the north near the Mararoa River swing bridge at the start of the Kiwi Burn Track.

The proposal comprises a terminal building, access road and parking, and the monorail itself which will be bridged over the Mararoa River west of the terminus. The architectural concepts prepared by Salmond Architecture depict a long low building. The forms (simple sheds with skillion roofs and deep overhangs) and materials (timber decks, timber and corrugated iron cladding, and corrugated iron roofs) are somewhat reminiscent in form and scale to traditional rural railway stations, and also in keeping with farm buildings found in such a landscape.

The eastern terminus would be readily accommodated in the farming landscape of the valley and in itself would have little effect on the World Heritage Area. The main point with regards the SOUV is that the monorail will be visible entering a wilderness-type area. In other words, such views will contribute to awareness of the monorail's presence in the World Heritage Area.

#### ***Western (Te Anau Downs) Terminus***

By contrast, the approaches to the western terminus are across modified farmland, and the monorails connection to the Snowdon Forest to the east would not be readily apparent from that locality.

The preliminary plans by Salmond Architecture depict a western terminus similar in style to that at the eastern terminus. The terminus is to be benched into the slope below the lodge, with bus parking and a monorail turning circle. The buildings themselves will have



a low and long profile, and will not look out of place in the context of the existing buildings.

The more prominent element will be the bridging of SH94 by the monorail. The plans indicate the monorail will cross above the highway, although I understand there is an alternative possibility that it may cross under the highway in a tunnel (which would be less prominent). A monorail in such a setting would be novel and unexpected, and therefore is likely to become a memorable feature. However, in my view it will be visually associated with the farmland on the east side of the highway rather than the outlook of the lake and mountains to the west.

Although it is technically within Fiordland National Park, and hence the World Heritage Area, the western terminus is only just within the park fringes and will be wholly within the developed grounds of the lodge – which in itself is a gateway to the park.

### ***Snowdon Forest Monorail Corridor***

The main component of concern with regards the SOUV is the monorail corridor through the Snowdon Forest which traverses a natural area comprising a mixture of beech forest, tussock grassland and three main rivers or streams.

Landscape effects relevant to the SOUV comprise biophysical aspects (physical modification to the landform and vegetation) and perceptual aspects (appreciation of the landscape's naturalness and wilderness qualities). Such aspects are part-and-parcel of what collectively comprises 'the landscape'.

### ***Biophysical aspects***

The monorail will require clearance of parallel 'avenues'<sup>3</sup> through the forest for the monorail and construction track respectively.

- a) Clearance will be required to maintain a 'loading gauge' for the monorail track 6m wide by 7m high (above the monorail) –plus any additional clearance needed to manage the risk of trees falling onto the line. In addition the application provides for three passing bays 100m long with clearance to 12m wide. As with the rest of the alignment, the precise location of the passing bays has not been identified.<sup>4</sup> While the monorail is to be supported off the ground on pillars, it is understood that a 3m wide metalled track will be constructed along the monorail alignment during construction.
- b) Clearance will also be required to accommodate the 3m wide construction track, and spur tracks connecting with the monorail alignment at approximately 200m – 300m intervals.<sup>5</sup>

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<sup>3</sup> I have not used the term 'corridor' to avoid confusion with the 200m corridor sought in the concession application

<sup>4</sup> The application states that they may be required at approximately the 10km, 20km and 30km marks. Fiordland Link Experience, Department of Conservation Concession Application, Mitchell Partnerships on behalf of Riverstone Holdings Ltd, 4 November 2009, page 43

<sup>5</sup> It is also understood that at least some of the spur tracks will be retained for maintenance purposes.

Such a dual track approach has been adopted in order to minimise the width of each 'avenue' through the forest, and to maintain as much of the canopy as possible above the tracks. Nevertheless, the reports prepared on behalf of the applicant estimate that construction will require removal of approximately 22ha of forest including roughly 15,700 moderate to large trees (>30cm dbh), and approximately 4.4 ha of grassland. Such figures are only estimates and are not based on an actual design.

#### *Perception of naturalness*

The project will change the landscape from one whose character is natural to one characterised by an engineering feature juxtaposed against a natural backdrop. The natural context will still remain; to be appreciated by those using the monorail and cycle-track. But the character will nevertheless be changed. Such situations are not necessarily unappealing – there are many examples where such juxtapositions become valued landscapes in their own right. It is, however, a fundamental change, and one that is at odds with the natural values identified in the SOUV.

The spatial extent of such effects will be determined by visibility and awareness of the monorail's presence.

- a) Visibility will be restricted by the fact the alignment is mostly (approximately 78%) within forest. The places where it will be most visible include the entry to the forest at the Mararoa River, the open areas in the Kiwi Burn valley (including the Kiwi Burn hut), the open river terraces along the Upukerora River, and the three crossings of the Whitestone and Upukerora Rivers. However, it would be wrong to simply calculate this as a proportion of the route. For example, people walking along the Upukerora River will see the monorail on the open terraces in the vicinity of Dunton Swamp, will pass under the bridge upstream of the swamp, and will pass under a bridge again where the monorail loops out over the river at the transition between Upukerora River and 'Ascension Creek'. The two bridges will be evident in 'view shafts' along the river. The movement of periodic trains will also attract attention and accentuate their visibility. So, although much of this section of the monorail will be screened within the forest on the river bank, people travelling along the river valley will still be aware of its presence. A similar situation will occur in the lower Kiwi Burn valley.
- b) Awareness will also occur within earshot of the monorail. Such effects are not concerned with 'noise' per se, but with awareness of the monorail's presence as a result of what would be an unexpected or incongruous sound in a natural landscape. The application indicates that the monorail might be audible at a distance of up to approximately 400m in forested country -less where there is an intervening landform or the masking sound of a river. Aural awareness will occur in conjunction with visual cues.

#### *Certainty of effects*

The application does not contain sufficient information to provide reasonable certainty about the physical landscape effects because the application does not have an

alignment or design. Rather, it is based on a 200m wide corridor<sup>6</sup> and principles to guide detailed design. To put it in context, in my view there would be insufficient information to process the application if it was a resource consent application.

I have accepted the description painted in the application of the extent of earthworks and clearance at face value. As stated in the applicant's 'Landscape Effects Report', "There would be absolutely no point in carrying tourists and visitors through a 'wasteland' of cleared forest."<sup>7</sup> Such assumptions though, in my view, should be reinforced by greater certainty in terms of a benchmark design and measureable criteria. This is covered further below under the heading 'Protection and Management'.

Nevertheless, there is sufficient information to enable a 'ball-park' appreciation of effects on perceptions of naturalness because such effects are fundamental in nature. They will follow in the first instance from the basic presence or absence of the monorail.

### ***Significance of Effects in Terms of Context***

The effects within the vicinity of the corridor need to be considered in terms of the nature of the landscape traversed. The following matters are relevant:

- a) On the one hand, the corridor (through the conservation estate) has a high degree of naturalness, reasonably scenic natural features, and is part of the World Heritage Area.
- b) However, it is also at the interface between a contiguous natural area to the north, and a more modified landscape to the south. The area to the north of the monorail comprises the bulk of Snowdon Forest and the adjoining Mavora Lakes Park. It is characterised by wild rivers, forested valleys, and extensive alpine areas above the tree line. By contrast, the area south of the monorail corridor consists of forested ranges and rolling hills interspersed with farmed valleys (extensive pastoralism) which are contiguous with general farmland further to the south.
- c) For this reason, it is understood the area traversed by the monorail corridor is considered a 'walk-in' or 4WD 'drive-in' area to the more wild and remote landscapes to the north. This is not wholly the case, because the Kiwi Burn track and hut is a 'front country' day-trip destination suitable for families. The main tracks or routes that will be affected by the monorail comprise:
  - The Kiwi Burn track, which is accessed by a swing bridge over the Mararoa River from Mavora Lakes Road. A popular destination is the Kiwi Burn Hut. The walk can also be extended as a loop track. The monorail will be a defining presence in front of the Kiwi Burn hut and the lower section of the Kiwi Burn valley;
  - A walking route and 4WD tracks along the Upukerora River from the end of Takora Road<sup>8</sup>, which provides access to Army Hut. The monorail will be

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<sup>6</sup> 300m wide at Upukerora Bluff where there is uncertainty over ground conditions

<sup>7</sup> Landscape Effects Report, page 9

<sup>8</sup> Takora Road is a private road and users require permission to use it to access the Snowdon Forest

parallel to approximately 4km of this route. Users would encounter the monorail within the first part of the route after the road end.

- A marked route from the Kiwi Burn valley to the Upukerora River by way of the Whitestone Valley. I am told it has low useage, mainly by hunters. The monorail alignment parallels this route for approximately 7km. The cycle track would likely replace this route in reality.

In summary, the monorail will have a significant effect on natural character in the vicinity of the corridor, but it will be near the periphery of a more extensive and more contiguous natural area, and is in a part of the conservation estate used by relatively few people.

### **Effects on Integrity of World Heritage Area as a Whole**

The following section of the report considers the effects discussed above in terms of the integrity of the wider World Heritage Area as a whole. The following matters are relevant in weighing the significance of such effects in terms of the values identified in the SOUV:

#### *Criteria viii*

- a) The area traversed by the monorail does not contain the superlative examples of natural features that are identified in the SOUV.
  - The mountains are relatively low compared to those to the north and west – they are not amongst the most “spectacular”;
  - The valleys and landforms are not the best examples of the glacial landforms that are characteristic of Te Wahipounamu;
  - It does not contain the “wildest rivers and gorges, most rugged coastlines, deepest fiords and lakes”; and
  - While the area contributes to the extent of the natural area, it is marginal to what might be described as a “vast wilderness” –for instance farmed landscape is visible from parts of the corridor.
- b) The area traversed is a peripheral area. The SOUV acknowledges traces of human presence particularly in peripheral areas. Snowdon Forest and the Mavora Lakes Park form a limb that extends beyond the core area of the World Heritage Area (for instance the area west of the Eglinton Valley). Within this limb, the monorail traverses an area between a more contiguous and extensive natural area to the north, and peripheral fingers of conservation estate to the south. The area to the north forms a massif of mountains between the Eglinton Valley and Lake Wakatipu. While the drier eastern part of the massif is characterised by high country stations, the wetter western part is a wilderness with wild rivers, forested valleys, and relatively high mountains with extensive alpine areas above the tree line. By contrast, the area south of the monorail corridor comprises three fingers and two outliers of conservation estate, interspersed with fingers of farmed land. It is not a contiguous natural area. Although rising to 1000m-1200m, the mountains south of the monorail corridor comprise the ‘foothills’ of the higher mountains to the north.

#### *Criteria viii*

- c) The area is contiguous with the larger natural area to the north in terms of flora, fauna, and geomorphology. I rely on other expertise with regards ecological matters. From the reports I understand the corridor has some areas that are relatively significant including in particular the lowland grassland, and areas of red beech.
- d) The area traversed by the monorail corridor does not contain the most legible or dramatic examples of glacial geomorphology, compared for instance with the southern lakes, fiords, and the main glacial valleys.

#### *Criteria ix*

- e) Although the corridor is on the periphery of the World Heritage Area, it forms part of the continuum between mountains and inland basins. It is part of an environmental gradient. I understand that the indigenous red tussock grasslands form part of such gradients and that their presence was one of the reasons the decision to include this area in the World Heritage Area.<sup>9</sup>

#### *Criteria x*

- f) Matters relating to biological diversity and threatened species are outside my expertise.

Taking these matters into account, while there will be significant effects on perceptions of naturalness in the vicinity of the monorail corridor, it will not significantly challenge the integrity of the World Heritage Area as a whole in terms of the values described in the SOUV, because:

- the corridor is on the periphery of the World Heritage Area; and
- while it contributes to the overall value of the natural wilderness, and does contain some significant elements such as the red tussock grassland, it does not contain the superlative features for which the World Heritage Area is recognised.

One way of testing this assessment is that if the boundaries of the World Heritage Area were to be re-drawn to exclude the monorail corridor and the area south of the corridor, the remainder of the area would clearly still retain integrity as a contiguous natural area and would contain all the values described in the SOUV.

### **Protection and Management**

As discussed, the physical effects within the corridor (earthworks, vegetation clearance, rehabilitation, visibility, habitat management) cannot be determined with accuracy because the application does not include an indicative design or quantifiable conditions. Rather, it contains design parameters (e.g. 200m corridor, width of loading gauge and construction tracks), 'best endeavours' principles to guide detailed design, and the use of management plans to control effects of construction.

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<sup>9</sup> Fiordland Link Experience, Department of Conservation Concession Application, Mitchell Partnerships on behalf of Riverstone Holdings Ltd, 4 November 2009, page 34

While it is normal to maintain some flexibility for detail design, it is reasonable in this instance, considering the nature of the works in a World Heritage Area, to anticipate:

- a) An indicative design to establish a benchmark against which effects and subsequent detail design could be measured.
- b) Quantifiable standards against which matters such as earthworks and vegetation clearance could be measured. Such conditions might address the identification of (and avoidance of or special works) in specific 'significant habitats' in the corridor, quantifiable measures of clearance width and canopy erosion, quantifiable earthworks (quantities and dimensions of cut and fill batters where required), rehabilitation of earthworks (including the 3m track beneath the monorail alignment), and rehabilitation (or retention?) of spur tracks.
- c) Outline of the details of management plans, including quantifiable standards discussed above, and the manner in which works could be under-taken during on-going operation of the monorail.

In the event a concession were to be granted, an approach to satisfying the protection and management required by World Heritage status might to be grant a concession in principle subject to a more detailed design and more rigorous suite of conditions.

## **CONCLUSIONS**

Values described in Te Wahipounamu Statement of Outstanding Universal Value' include:

- Vast almost intact natural wilderness;
- Superlative examples of scenic beauty, especially mountains and glacial landforms;
- Extensive and almost intact temperate rainforest;
- Best example of 'Gondwana' taxa;
- Outstanding example of Pleistocene glacial geomorphology;
- Continuums of natural habitats, with dynamic gradients and successions; and
- Extensive range of New Zealand fauna.

In summary, the monorail will have significant effects on naturalness (both biophysical naturalness and more particularly perceptions of naturalness) in the vicinity of the monorail corridor. The nature of the effect will be a fundamental change from a natural landscape to one characterised by an engineering feature juxtaposed against a natural backdrop. The extent of these immediate effects will be confined to the valleys traversed by the monorail - those landscapes within view and ear-shot of the monorail. Within this area the degree of effect will be significant. However, the significance will be moderated by the corridor's alignment toward the periphery of the conservation estate in an area used by relatively few people.

The degree of effect on the integrity of the broader World Heritage Area will be minor. While the monorail is at odds with the value placed on naturalness, the corridor is near

the periphery of the World Heritage Area, it is in proximity to the interface of natural and human modified landscapes, and it does not contain the superlative examples of landform for which Te Wahipounamu is recognised.

While the information contained in the application describes 'ballpark' effects sufficient to enable an assessment against the integrity of the wider World Heritage Area, there is insufficient certainty over effects in the vicinity of the corridor itself because the application does not include an alignment and design against which effects could be measured, nor quantifiable conditions.

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