

Waitaha Hydro intake site – an update on design features in relation to landscape, natural character and visual amenity

Introduction

Following the Minister's decision on the Waitaha Hydro Scheme concession application Westpower has undertaken a further comprehensive design assessment to determine whether the Scheme's intake structures can be altered to reduced the effects on natural character. With the input of a number of experts (landscape, engineering, tunnelling and surveying) Westpower is now proposing an amended intake design. As can be seen from Figures 1 and 2 below this new design will reduce the effects of the Scheme on natural character.

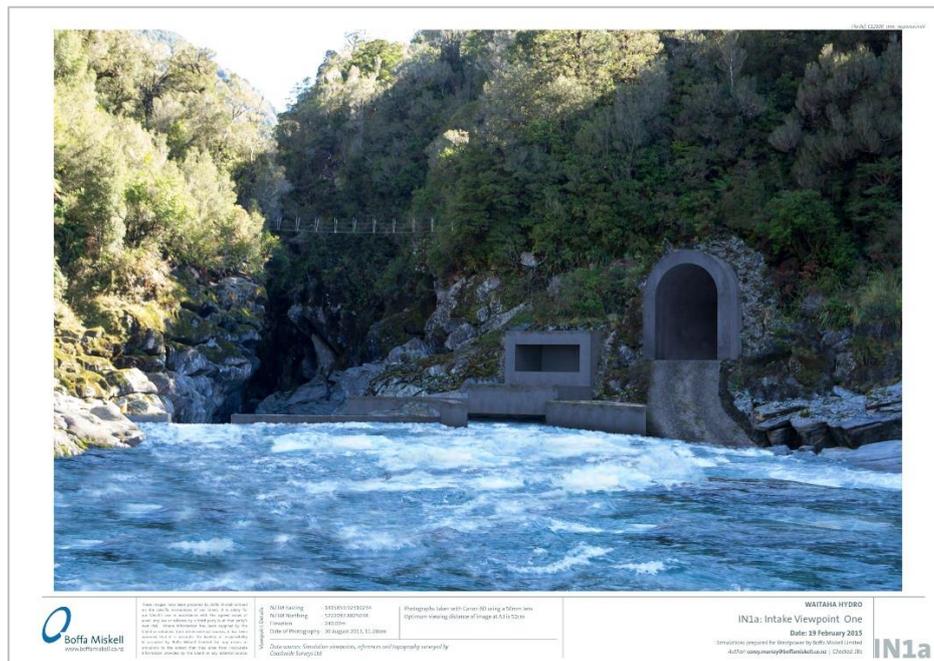


Figure 1 – Previous intake simulation image



Figure 2 – New visual simulation of the intake (after 10 years)¹

¹ For the full document and larger images refer to Appendix A.

The background to this new design option is discussed below.

Background

The need to undertake activities on conservation land carefully and sensitively is well understood by Westpower. Westpower has a proven history of respecting those values through its work, including through the Amethyst Hydro Scheme, which has a very small environmental footprint.

Westpower adopted a particularly careful, constructive and proactive approach to this application in recognition of the status of the land as public conservation land. The process commenced in 2005, with the application being lodged in 2014.

The process involved:

- (a) assessment of alternatives;
- (b) drawing on successful experiences in implementing the Amethyst Scheme's concession;
- (c) commissioning a cohort of experienced and reputable experts to assist in the design of the Scheme and the assessment and mitigation of potential adverse effects;
- (d) an extensive and iterative process of refining and amending the design to respond to matters raised by the Department of Conservation and its experts, and stakeholders, including offering additional mitigation; and
- (e) effective resolution of most issues, with those that remain being well addressed in the application.

The avoidance of adverse environmental effects has been Westpower's primary objective through the design of the Scheme and the consideration of options and alternatives, mitigation methods and conditions – all developed with expert advice. The aim has been to make the most efficient and effective use of the renewable hydro generation resource while ensuring the maintenance of natural, environmental and recreational values to the greatest extent possible. Where this is not practical or feasible, mitigation methods including monitoring have been recommended through proposed conditions.

In discussing the efforts made to avoid, remedy and mitigate the impact of the Scheme and the appropriateness of the Scheme within its receiving environment, landscape architect James Bentley (Boffa Miskell) says:²

Through iterative design measures and options studies, the Scheme has avoided potentially more significant effects such as the damming of the river, creation of a lake or placing the structures elsewhere in the Upper Catchment. Landscape input into the design has shaped the project to reduce the physical and visual impact. ...

Many of [the recommended] measures have been incorporated in the planning stages of the Scheme, where the project design has aimed at minimising where possible effects to natural character, landscape and visual amenity values. Key elements of the design include:

- *A decision not to build a vehicular access road into Kiwi Flat;*
- *Using underground tunnels for transporting water from the intake to the powerhouse and locating the penstock within the tunnel;*

² Bentley, James. *Waitaha Hydro Scheme: Natural Character, Landscape and Visual Amenity Effects*, 2014 (Appendix 9B of the AEE pp 67-69).

- Low level weir design;
- Selecting an option of tunnel and intake ... where overall effects were considered by experts to be significantly less than [the other proposed option].

Intake Structures

The Waitaha Hydro Scheme intake is located in the Upper Waitaha Catchment near Morgan Gorge, an area that has been assessed as being of outstanding natural character.³

The intake structures consist of:

- a low weir across the river;
- an intake channel on the right bank of the river which takes the river flow to the intake gate and incorporates a channel and gate to sluice sediment past the intake;
- an intake gate housed at the start of a roofed culvert to convey the flow into the tunnel portal;
- a second intake gate to allow water intake during high flood periods when the lower gate will be subject to high sediment load; and
- an access tunnel.⁴

The above includes two portals, at the access tunnel and at the water intake tunnel. The intake structures are part of the headworks which also include settling basins, collection channel and penstock intake, and sediment flushing channel – all of these concealed within the rock. A concept drawing of the water intake, and an image showing the approximate location of the water and access portals can be seen in in Figures 3 and 4 below.

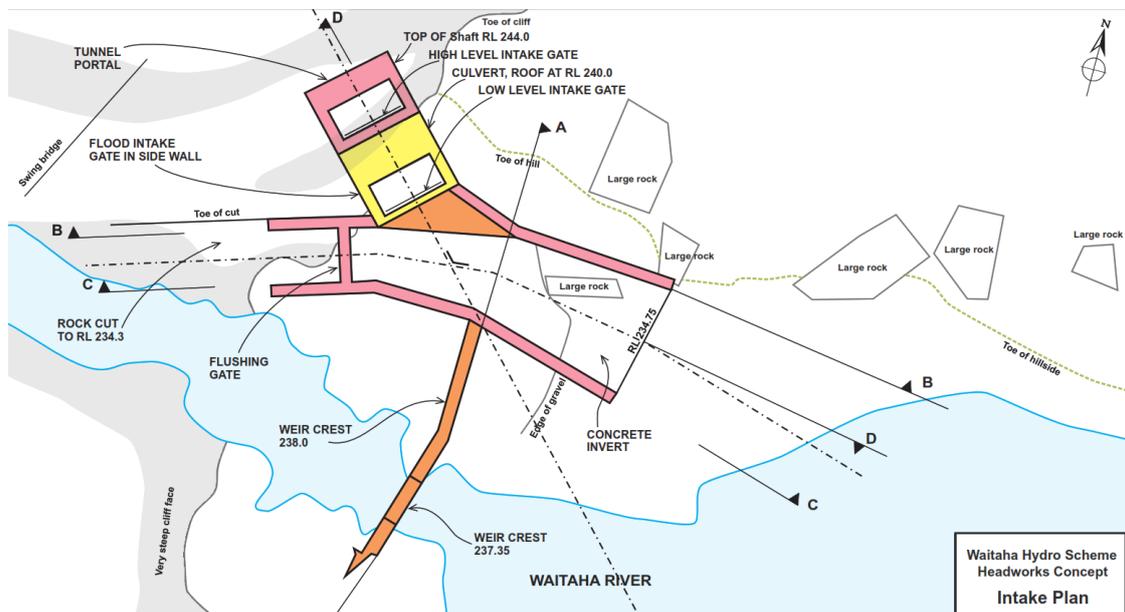


Figure 2 - Intake Concept Drawing 5

³ The Upper Waitaha Catchment and Project Area is not within any areas listed as an outstanding natural landscape or feature within the Westland District Plan nor the West Coast Regional Policy Statement. However, given the landscape qualities and values found in the upper Waitaha catchment and the high level of naturalness, it is likely that the upper Waitaha catchment would be considered an outstanding natural landscape and that the Morgan Gorge would be considered as an outstanding natural feature within this landscape. Bentley, James. *Waitaha Hydro Scheme: Natural Character...* and Lister, Gavin. *Proposed Waitaha Hydro Scheme: Landscape and Urban Design External Review*, 2014 (Appendix 9C of the AEE).

⁴ McCahon, Ian. *Waitaha Hydro Scheme, Morgan Gorge Intake: Preliminary Headworks Concept*, 2013 (p 2).

⁵ McCahon Figure No 2818 – A1.



Figure 3 - Intake Portal Locations Key: orange markings represent the location and orientation of the intake structures only and are by no means representative of their visual appearance.

Context for assessing impacts of intake structures

The design of the weir, the intake structures and the portals was greatly influenced by their appearance within the surrounding landscape, with much effort focused on minimising the impact on the surrounding environment to ensure the structures were acceptable. As a run-of-river scheme, Waitaha Hydro has a limited footprint and only impacts the small areas at the intake and powerhouse. At the headworks, the settling basins and penstock are concealed within a tunnel, and the increase in water level is minimal.

When discussing the appropriateness of the intake structures within its receiving environment, landscape architect James Bentley (Boffa Miskell) says: ⁶

In order to achieve an acceptable outcome, a number of Landscape Objectives have been developed. ... The overall objective will be:

To use construction methods and materials where feasible that will minimise effects on the environment, including reducing visual prominence and enable recolonisation of vegetation. ...

Specific Objectives for the Intake Area include:

Avoiding significant cuts and battered slopes for access roads including avoiding their proximity to river bank features; and keeping works in the bed or the river to the minimum required to construct and maintain the road

Ensuring that the intake structures intersect with the existing topographic features and that appropriate cliff stabilisation measures are sensitively implemented;

Ensuring that active and passive rehabilitation measures are effective, notably for the construction sites [.]

⁶ Bentley pp 67-69.

Landscape and Natural Character Assessments

In 2014, Mr Bentley carried out an assessment of the effects of the proposed Waitaha Hydro Scheme on natural character, landscape and visual amenity on local and broader scale.⁷ He concluded that:

1. The broad scale landscape effects on the Upper Waitaha Catchment as an Outstanding Natural Landscape and on Morgan Gorge as an Outstanding Natural Feature would be low or moderate to low. This is mainly because of the “small and defined footprint of the Scheme, which avoids damming the river, avoids the formation of a lake ... and avoids creating large cuts for access road from the lower valley into the upper valley”.
2. The effects on Morgan Gorge, “...will not affect the overall biophysical, associational and sensory values of the gorge to a significant degree and therefore not reduce its ‘outstandingness’ as an outstanding feature”. This is because the river will maintain its course through the gorge even in low flows and the associated cliffs and natural eroding will continue.
3. There would be high natural character local effects because of the introduction of an “intensified industrialised-style modification” within an area that holds high natural character values.
4. There would be a moderate level of effect on the perceptual aspects of natural character effects through the abstraction reach because the river will continue to operate as it does naturally, except during reduced river flows in drier periods.
5. There would be a high level of effects on landscape at the local scale but this drops to low at a broader scale.
6. There would be a high visual amenity effect from close viewpoints, reduced to moderate to low from more distant viewpoints.⁸

In summary, Mr Bentley’s report commenting on the previously presented design concluded that:

“The mitigation measures proposed, and the design process, has enabled the Scheme to sit well within its landscape and to respond to its setting and to acknowledge the outstanding landscape, natural character and visual amenity values the Upper Waitaha Catchment holds by avoiding potentially major effects. Overall, it is considered that the Scheme is appropriate with respect to natural character, landscape and visual amenity despite the fact that at more local levels the natural character, landscape and visual amenity effects are assessed as being moderate to high (or more than minor under the RMA). At a broader scale the effects are low (or minor under the RMA).”⁹

Although in his peer review of Mr Bentley's report,¹⁰ landscape architect Gavin Lister (Isthmus) regards Mr Bentley's methodology and analysis as sound and thorough, he recommends considering the Scheme as a whole rather than a compartmentalised assessment:

*“...whether the landscape effects are acceptable and the Scheme appropriate would entail consideration of the landscape matters **as a whole** including (amongst other things):*

⁷ Bentley, James. *Waitaha Hydro Scheme: Natural Character...*

⁸ Bentley pp 3-4.

⁹ Bentley p 4.

¹⁰ Lister, Gavin. *Proposed Waitaha Hydro Scheme: Landscape and Urban Design...*

- i. *The nature of the Scheme itself (i.e. that it is a run-of-river scheme that avoids damming the river, and there has been landscape input to the shape of the project),*
- ii. *The extent to which the duration and level of residual river flows are acceptable, and*
- iii. *Details of the intake structures, and how intrusive they are in the immediate vicinity."*

Mr Lister also notes that whether the intake structures are acceptable depends on the design: *"the degree to which such a feature might be acceptable will depend on how 'surgical' the insertion of the structure into the landscape is, and the extent to which the disturbance is minimised".*¹¹

Further Design Work

The key impact of concern to the decision-makers, including the Minister, and the reason for why the Waitaha concession application was declined was the immediate effects of the Scheme's intake structures, including the portals and weir on the Morgan Gorge which, as noted above, were regarded as being "high" at a local level.¹²

Westpower maintains its position that the impacts of the intake structures on natural character have been suitably remedied and mitigated to an acceptable level. Further, Westpower considers that if a pragmatic assessment is adopted and the intake structures are assessed in the context of the wider West Coast area which has a number of unique and outstanding rivers and gorges, at a broad scale, the impacts of the intake are acceptable.

However, following the Decision, Westpower undertook a review to determine whether or not there were any further measures that could practicably be adopted to minimise the effects of the Scheme on the intake area just above the Morgan Gorge.

In April and May 2022, Westpower brought together its expert landscape architects Mr Bentley and Mr Lister as well as an engineer Mr Stephen Matheson (Mitton ElectroNet), a tunnel specialist Mr Ant Black (Geotech) and surveyor Mr Blake Neale (WSP) and asked them to work together to determine whether additional measures were available to practicably further reduce the impact of the Waitaha intake structures on natural character. These consultants took part in a brainstorming session, several meetings, and a site visit¹³ where they were helicoptered to the top of the Morgan Gorge to consider the proposed works within the natural environment.

¹¹ Lister paragraphs 21-22.

¹² The Decision Report provides at [94] – [95] *"The powerhouse and other infrastructure at Macgregor Creek and the weir and other intake structures upstream of Morgan Gorge will be visible to trampers using the current DOC track which runs along the true right bank of the river, and those accessing the river. This will change the experience from an undeveloped backcountry remote setting to one where industrial-style structures will be present....*

A condition is proposed in the Officer's Report requiring Westpower to provide alternative track access that is to avoid the powerhouse site construction area."

The Decision at [5] *"The proposed location of the weir and intake structure above Morgan Gorge is in a near to pristine, wild yet accessible, area with high conservation values. The adverse effects of the activity would significantly impact its natural character. As a result, the intrinsic value of the area as well as the enjoyment and appreciation of the area by members of the public will decline. I am particularly concerned about the impact of the area changing from a near-natural state on the experience of recreational users who use the area. Their experience and perception of the area will be degraded, noting that recreation is a feature of the Act's conservation purpose."*

¹³ Due to disruption to flights Mr Lister was unable to travel to the West Coast on the day, however he was part of the subsequent briefing and in agreement with the rest of the group.

The objective of the site visit was for the consultants to reach a consensus and make a recommendation on alterations to the design of the intake structures, including for example to the location and size of the access portals:

- That would be achievable and practical from the engineering perspective; and
- That would have a distinctly lesser impact on landscape, natural character and the visual amenity compared to the existing design.

During the site visit, the precise location of the intake portal and access portal was marked on the moss-covered rock by Mr Neale, so that their precise location could be assessed from across the river and assessed on a close-up view, in relation to the vegetation, geological formations and water features.

The site visit was invaluable in clarifying the visibility of the intake structures from the swing bridge and the tramping track. The portals are on such an angle that they are not visible from the swing bridge, which however gives a direct view of the sharp lines of the weir. The portals will be seen from the track along the river, especially by walkers heading towards the swing bridge, but the visibility of the weir will be reduced because it will be viewed at a low angle from the same level. Importantly, the structures will only be partly visible by the few¹⁴ who visit the area for a very short period of time, approximately 5-10 mins of the 3-hour hike.

The wide-ranging and significant expertise of the consultant group allowed them to directly evaluate what alterations could be made to the current design of the structures to improve their appearance and reduce the impact of the structures on natural character, while also maintaining their functional integrity. Considerations were given to the equipment needed for the construction and maintenance of the Scheme, as well as to the arrangement of the structures on site, and the composition of natural materials.

Further design options identified

The consultant group identified three options which they considered in some detail:

Option 1 (preferred): Maintain two portals at the current location, but with the access portal smaller

It was previously assumed that a large digger, at least 13 tonne, would be needed for the construction and maintenance of the intake structures, such as clearing the flood debris, requiring a large (5m x 7.5m) access portal to be constructed to store the digger.

However, Mr Black (tunnel specialist) has advised Westpower that a smaller five-tonne digger would be sufficient for the construction and maintenance, reducing the size of the access portal required to 3m x 3m. This smaller access portal would still provide enough space for bringing construction equipment on site and storing the digger. This is a significant reduction in the size of the access portal, resulting in a considerably smaller opening in the rock.

In addition, as part of Option 1 (and equally applicable to all the options below) the consultant group agreed that the material exposed at the entrance to both portals, which was previously strengthened with shotcrete and portrayed in simulation images as geometrically (arch) shaped concrete blocks, could be altered. The consultant group agreed that the strong rock composition at the site will make it possible to leave the rock uncovered, displaying the natural shape of the stone. In fact, it was recommended to blend it in with the natural lines of the surrounding schist when designing the shape of the portal, so that it "respects the natural characteristics of the area, aligning the portal entrances

¹⁴ Greenaway, Rob. *Waitaha Hydro Scheme Investigations: Recreation, and Tourism Assessment of Effects, 2014* (Appendix 20A of the AEE) p. 6. Approximately 50 hunters using the Waitaha Valley area annually and fewer than 150 trampers and day visitors accessing Kiwi Flat annually is assessed to be "low" use.

with the striations of the surrounding rock".¹⁵ This will give the portal a more natural cave-like appearance, and further significantly reduce the level of effect on natural character.

Option 1 is represented in the new simulation image created by Mr Bentley, attached as Appendix A to this report.¹⁶ The image was produced from a photo and surveying data obtained during the recent site visit and shows the river and landscape features in their current state with and without the inclusion of Option 1.

When creating the new image, Mr Bentley worked closely with the engineer Stephen Matheson to ensure that all engineering requirements would be included and the structures reflected in a realistic manner.

Shown in the simulation image is the weathering of the intake structures that will be accelerated by the use of rough-hewn concrete and will promote the growth of plants and mosses. The image also shows how the careful placement of rocks and boulders will assist with the integration into the natural landscape. There will be no shelter required at the access portal due to other engineering solutions to prevent rock fall, and so it does not feature in the image.¹⁷

Further to the portal design, a suggestion was made by the tunnel expert that the digger may not need to remain on site for maintenance if the clearing flood gravels can, for example, be removed with alternative technology such as water jets. Without the digger remaining on site, the access portal would only be needed for foot access, reducing the size of the access portal even further to possibly 2m x 2.5m. A smaller size access portal would also be a great advantage for Option Two discussed below.

However, the feasibility of removing the digger and relying on other technology for maintenance purposes is yet to be fully tested. There is therefore some risk that this option is not practicable and cannot be implemented. At this stage Westpower cannot commit to a human-sized access portal as part of the Scheme, but will explore whether it could be adopted.

The reduction in natural character effects is demonstrated via a comparison of Mr Bentley's new image (Appendix A) with the image of the previous intake design included as Appendix B.

Option 2: Intake portal and access portal combined

The consultants suggested that Westpower could investigate the slight possibility that the two portals could be combined into one portal of the same size as the current water intake portal. Extensive work would be required on the engineering design to ensure that the operational integrity of the headworks would not be compromised by combining the two portals. It is anticipated that several months of engineering work would be required to achieve a single portal design suitable for directing water into the diversion channel, into the penstock, and allowing for a flood intake, while keeping the access tunnel dry.

While not proposing that this option be adopted as part of the Scheme because its feasibility is yet to be confirmed, Westpower will explore this option to determine whether having one portal is practical.

Option 3: Access portal further around the corner

The option of re-locating the access portal further around the corner to conceal it by vegetation was briefly considered but deemed impractical. At the alternative location the soil material is less stable and in the vicinity of a creek, which means that more extensive excavations would need to be

¹⁵ Bentley, James (Boffa Miskell). *Memo: Proposed Waitaha Hydro Scheme – Landscape Assessment of Scheme in Light of Updated Portal Design*, 2022 (p 1).

¹⁶ Bentley, James (Boffa Miskell), *Waitaha Hydro: Updated Visual Simulation*, 2022.

¹⁷ Bentley, *Memo...* pp 1-2.

undertaken. Furthermore, digger access to the river would need to be formed, causing a more visible impact on landscape.

Preferred option – Option 1

There was a clear consensus among the consultant group that Option 1 is the preferred option because it notably reduces the size of the access portal from 5m x 7.5m as previously proposed compared to a much smaller, 3m x 3m, access portal and will ensure that the entrance to both portals has a natural cave like appearance rather than having an industrial concrete look.

Further considerations

A couple of alternatives were considered by the consultant group for the weir. However, the idea of constructing the weir out of sight in a rock cavern was rejected because the engineering requirements would require a much bigger portal size. The consultant group agreed that the intake structures should remain clean and surgical, rather than trying to imitate nature. While the shape of the structures remains unchanged, the walls sitting on the bedrock have been wrapped in Corten steel to allow them to blend better with the environment.

In an effort to further minimise the impact of the intake on tramping, Westpower will explore whether it could be possible to divert the section of the track that follows after the swing bridge (going towards the Kiwi Flat Hut) to continue through the bush. This section would be directly opposite to the intake structures, and would be approximately 100 metres long. With the track continuing through the bush until it reaches the Labyrinth Creek, trampers would be surrounded trees which would limit the close view of the structures. The geography of this specific location will need to be assessed to determine the feasibility of the idea.

Westpower approached Mr Bentley and Mr Lister to comment on the updated design of intake structures, and to review to what extent the design modifications described above alter the effects on the landscape, natural character and visual amenity in the intake area. Both landscape architects were part of the review process, and Mr Bentley visited the site to take photos and collect information for an updated simulation image.

Both experts re-confirmed their earlier observations while also recognising that "meaningful" and "worthwhile" changes have been made in the design. Mr Bentley in referring to established assessment categories, finds the local effects to be high, and on the broad scale (within the surrounding catchment and regional environments) finds the effects to be low to moderate. In view of the updated design, Mr Bentley acknowledges that the new features have been carefully designed, and allow the structures to fit better within the environment.

Mr Lister finds the overall impact to be high and at the same time highlights the importance of design in determining whether the intrusions can be acceptable. Regarding the location of the intake, and the location of the access portal, Mr Lister agrees that the current locations result in the least disturbance to the adjacent area compared to other options. He sees the weir as the clean minimalist structure that will have the least interruption to natural patterns, and the steel sheathing will provide a more naturalistic finish. The smaller size of the access portal and its rough-hewn form will respond well to the natural pattern of schist, therefore achieving a lighter touch.¹⁸

Even with its small scale and minimal footprint the Waitaha Hydro Scheme will unavoidably have some effect on the surrounding environment. The key consideration, and that of utmost importance in this matter, is whether the design features sufficiently mitigate and minimise the effects to the level where the unavoidable intrusions can be perceived as acceptable to the degree where they are sympathetic

¹⁸ Lister, Gavin. *Memo: Proposed Waitaha Electricity Project Landscape Peer Review*, 2022.

to the values of the landscape in view of the ongoing conservation of New Zealand natural resources and continued appreciation of the outdoors.

Westpower's position

Westpower is committed to implementing design solutions that have the lowest impact on the natural character of the area, and the lowest impact on the visual amenity, while being achievable and practical from an engineering and operational perspective. The updated design of the intake structures, as proposed in Option 1 above, offers some specific changes (from the original application) that are practicable and achievable:

- The size of access portal reduced to 3m x 3m
- Portal entrance featuring natural rock as opposed to concrete
- Shape of portals reflecting the natural layering of schist.

To achieve minimal disruption to the area and to enable the regeneration of the site, Westpower will follow a detailed landscape development plan that will be endorsed by a landscape architect, followed by an inspection after the construction.

Westpower considers that the Scheme, is carefully and sensitively designed to fit with the public conservation land context including the surrounding natural character values. While Westpower's position remains that the currently proposed solutions to avoid, remedy and mitigate effects will reduce impacts on natural character values and recreation to an acceptable level, particularly when the intake is assessed at a broader scale within the context of the West Coast as opposed to a local scale, with the implementation of Option 1 the effects will be reduced even further.

There will inevitably be some impact from a Scheme such as this (as is the case for any physical works in a conservation area), but that impact has been minimised as far as practicable and is minor, temporary and manageable if viewed in context.

It is critical when assessing the impact of the intake structures on the surrounding environment to consider the broader context within which the works will be situated as opposed to confining this assessment to only the immediate vicinity of the Scheme. By way of example:

- a) A significant proportion of the land on the West Coast is public conservation land, 85% – 1.912 million Ha. For a scheme of this nature on the West Coast, it is unavoidable that public conservation land will be involved (and as noted above, Westpower went through the process of considering alternatives to public conservation land);
- b) The Scheme is as non-intrusive as possible, being a 'run of the river' scheme as opposed to a dam. The Scheme has a small and defined footprint which avoids damming the river, forming a lake or creating large cuts for access roads. Most of the infrastructure will be underground and there will be two particular points at which infrastructure will be visible (the intake and the powerhouse sites).
- c) The Waitaha Catchment is 31,561 Ha (0.017% of the West Coast public conservation land). The total Scheme footprint once operational is 3.62 ha (0.000002% of the West Coast public conservation land), with a maximum construction footprint of 4.14 ha.¹⁹ The scale of the Scheme in the overall regional context means the extent of any effect will be very limited as demonstrated in the figures attached in Appendix C;

¹⁹ The access road comprises the biggest portion of the footprint whereas the intake structures are only a very small portion of the footprint.

- d) The Act expressly contemplates that structures and infrastructure can be placed on public conservation land, both by the Department in its management functions (such as huts, tracks and bridges) and by other parties (such as infrastructure through the concessions process).
- e) It is common for visitors to experience structures and infrastructure on public conservation land, including DOC huts, tracks, bridges, roads and transmission infrastructure, this applies to the Waitaha catchment. For example, there is a swing bridge which traverse the Morgan Gorge in the immediate proximity of the weir and portals (noting that it is only the weir can be seen from the bridge). There are several land use consents and concessions for works in the bed of the river and schist extraction operations occur in Macgregor Creek. Further, helicopters frequent the Upper Waitaha Catchment;
- f) The visitor experience of the Scheme's infrastructure is temporary and only visible on a very small portion of the hike used by trampers and the structures (particularly following the additional design work discussed above) are designed to blend in with the natural environment as far as possible;
- g) An appreciation of 'scale' and 'perspective' is critical in assessing this application. The Scheme:
 - a. will be visible only temporarily by the very few hunters and trampers who visit the area when viewed from the immediate locations;
 - b. has a very small physical footprint when viewed in the context of the Waitaha Valley; and
 - c. has an extremely small footprint when viewed in the broader context of public conservation land on the West Coast;
 - d. while the upper Waitaha catchment would be considered an outstanding natural landscape and that the Morgan Gorge would be considered as an outstanding natural feature within this landscape:
 - i. the features of the landscape are not uncommon in West Coast upper river catchments and Morgan Gorge is one of many equally unique gorges on the West Coast; and
 - ii. the Scheme is an appropriate development (in terms of natural character, landscape and visual amenity) as the underlying features that comprise and define the outstanding natural landscape and features are protected.
- h) The Scheme can co-exist with other activities such as kayaking and tramping, again, if a pragmatic view is adopted. The benefits of renewable energy (including in terms of the significant implications for conservation arising from climate change), and the interests of those using the Waitaha Valley for recreational activities can both be accommodated – those outcomes are not mutually exclusive;
- i) The impacts on tramping will be minimal and temporary – trampers coming across the intake or powerhouse sites (along with other existing structures such as the adjacent hut and bridge) will notice those structures only briefly and move on – there are numerous tramping opportunities on the West Coast, and this will be a minimal and temporary impact on just one of them. Trampers are accustomed to dealing with non-natural physical structures (such as the bridge over the river in the immediate vicinity of the intake site);
- j) There is no active pest control is undertaken on this stewardship land;

- k) The project area is not "pristine" and not rated at the highest end of the naturalness spectrum due to a number of modifications including pests, tracks, huts, a swing bridge, its use for hunting and kayaking and other infrastructure discussed above;
- l) The project area is in close proximity to the boundary with the lower Waitaha catchment and away from the truly wild and more remote areas further upstream beyond Waitaha Gorge;
- o) The Scheme is not occurring within a national park or one of New Zealand's highest rated conservation areas, the river is not subject to a WCO and there are areas of existing modification and disturbance;
- p) The effects of the scheme on Morgan Gorge will not affect the overall biophysical, associational and sensory values of the gorge to a significant degree and, therefore, will not reduce its 'outstandingness' as a feature. The weir will appear close to the entrance of the gorge along with the intake structure, the river will maintain its course through the gorge despite reduced flows and the natural eroding of the broader gorge by fluvial processes will continue;
- q) Natural freshes and floods will continue to occur in the river. The river will essentially continue to operate as it does naturally, albeit with reduced flows during drier periods. Abiotic and biotic natural character effects would be minor for the abstraction reach;
- r) There will be no effect on the landscape values associated with Waitaha River hot springs within the Gorge;
- s) The Scheme is not inconsistent with the purpose for which this land is held or the conservation planning documents;
- t) The mitigation measures proposed and the iterative design process have enabled the scheme to sit well within its landscape and respond to its setting and to acknowledge the outstanding landscape, natural character and visual amenity values the upper Waitaha catchment holds by avoiding potentially major effects;
- u) Overall it is considered that the scheme is appropriate in terms of natural character, landscape and visual amenity despite effects at a local level are assessed as being moderate to high but at a broader scale, low or minor;
- v) Overall "Landscape values will largely be retained. A sense of wild and remoteness will still be retained within the Upper Catchment. The landscape will still be outstanding."²⁰

Westpower's position is that the key is whether or how the effects of the modifications to landscape and natural character will be experienced. The intake structure will be small and only experienced by those very few people who undertake recreational activities such as tramping in the area.²¹ Overall, and in this context the effect on landscape and natural character are appropriate. Westpower considers that the Department Report's and the Minister's decision failed to understand this key context.

When a real-world and pragmatic view is adopted taking into account the important broader scale landscape context described above, the effects on natural character are significantly reduced to an acceptable level such that this concession can be granted. Westpower has proposed appropriate and

²⁰ James Bentley report to hearing panel dated 8 December 2016.

²¹ Greenaway, *Rob Waitaha Hydro Scheme: Recreation, and Tourism Assessment of effects.*

workable mechanisms to avoid, remedy or mitigate the potential residual adverse effects that have been identified.

This is particularly the case when the benefit is to be gained from a small hydro renewable electricity scheme such as the Waitaha in contributing to the reduction of emissions and so supporting the initiatives set in the Government's Emission Reduction Plan. It is well understood that additional electricity generation is essential for the electrification needed to replace fossil fuels, and that greater resilience of electricity supply will be supported by increasing local electricity generation, and these factors must also be included in the overall consideration of Waitaha effects on the environment.²²

In the case of the Waitaha, all effects, except those relating to natural character, are negligible to minor. The impact on natural character has been minimised as far as practicable and is minor, temporary and manageable if viewed in the broader context.

In this context, Westpower's position is that the impact on natural character is acceptable to provide renewable electricity generation which is much needed to address New Zealand's climate crisis.

²² The Plan refers specifically to distributed generation in the community, such as solar or wind at individual dwellings, but the same can be applied to small generation schemes such as Waitaha.

For discussion on projected electricity demand, and on Waitaha role in providing resilience to the local power supply, refer to Erik Westergaard's Economic Viability report written for Westpower in 2022.

Boffa Miskell 

WAITAHA HYDRO
UPDATED VISUAL SIMULATION

18 MAY 2022





This plan has been prepared by Boffa Miskell Limited on the specific instructions of our Client. It is solely for our Client's use in accordance with the agreed scope of work. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate. No liability or responsibility is accepted by Boffa Miskell Limited for any errors or omissions in the subject that they arise from inaccurate information provided by the Client or any external source.

Viewpoint Details

Easting : 1 003 054 mE
Northing : 0 012 203 mN
Elevation/Eye Height : 220.0m / 1.0m
Date of Photography : 12:30pm 5 May NZST
Data Sources: Survey data provided by WSP

Lens : 28mm
Horizontal Field of View : 65°
Image Reading Distance @ A3 is 30 cm

WAITAHA HYDRO
Visual Simulation: Kiwi Flat - Existing

Date: 18 May 2022 | Revision: 2

Plan prepared for Westpower by Boffa Miskell Limited
Project Manager: James Bentley@boffamiskell.co.nz | Drawn: CMU | Checked: JBe

Figure 2



Boffa Miskell
www.boffamiskell.co.nz

This plan has been prepared by Boffa Miskell Limited on the specific instructions of our Client. It is solely for our Client's use in accordance with the agreed scope of work. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate. No liability or responsibility is accepted by Boffa Miskell Limited for any errors or omissions in the subject that may arise from inaccurate information provided by the Client or any external source.

Viewpoint Details

Existing : 1 003 554 mE
Northing : 0 012 203 mN
Elevation/Eye Height : 230.0m / 1.0m
Date of Photography : 12:30pm 5 May NZST

Data Sources: Survey data provided by WSP

Lens : 28mm
Horizontal Field of View : 65°
Image Reading Distance @ A3 is 30 cm

WAITAHA HYDRO

Visual Simulation: Kiwi Flat - Proposed view after 10 years

Date: 18 May 2022 | Revision: 2

Plan prepared for Westpower by Boffa Miskell Limited
Project Manager: James Bentley@boffamiskell.co.nz | Drawn: CMU | Checked: JBe

Figure 3

Visual Simulation Methodology:

This Visual Simulation has been created using a combination of survey and engineering data, and site photography. A summary of this process is outlined below.

Site Visit:

Site photography is undertaken and camera tripod location surveyed. Laser scan survey undertaken.



Production:

Using the survey data, we position and align a virtual camera to the photograph taken on-site. A 3D model of the proposed elements is then incorporated



Compositing:

Proposed elements are then rendered to apply lighting and textures, and are overlaid onto the photograph for masking and further refinement and detailing.



Appendix B: Previous Simulation

File Ref: C12108_sims_response.indd



These images have been prepared by Boffa Miskell Limited on the specific instructions of our Client. It is solely for our Client's use in accordance with the agreed scope of work. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate. No liability or responsibility is accepted by Boffa Miskell Limited for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.

Viewpoint Details:

NZTM Easting : 1415859.92310234
 NZTM Northing : 5222097.8825038
 Elevation : 240.02m
 Date of Photography : 30 August 2013, 11:28am

Data sources: Simulation viewpoints, references and topography surveyed by Coastwise Surveys Ltd

Photographs taken with Canon 60 using a 50mm lens
 Optimum viewing distance of image at A3 is 52cm

WAITAHA HYDRO

IN1a: Intake Viewpoint One

Date: 19 February 2015

Simulations prepared for Westpower by Boffa Miskell Limited
 Author: corey.murray@boffamiskell.co.nz | Checked: JBE

IN1a

Appendix C: The scale and location of the Scheme within the West Coast region and on the local level

