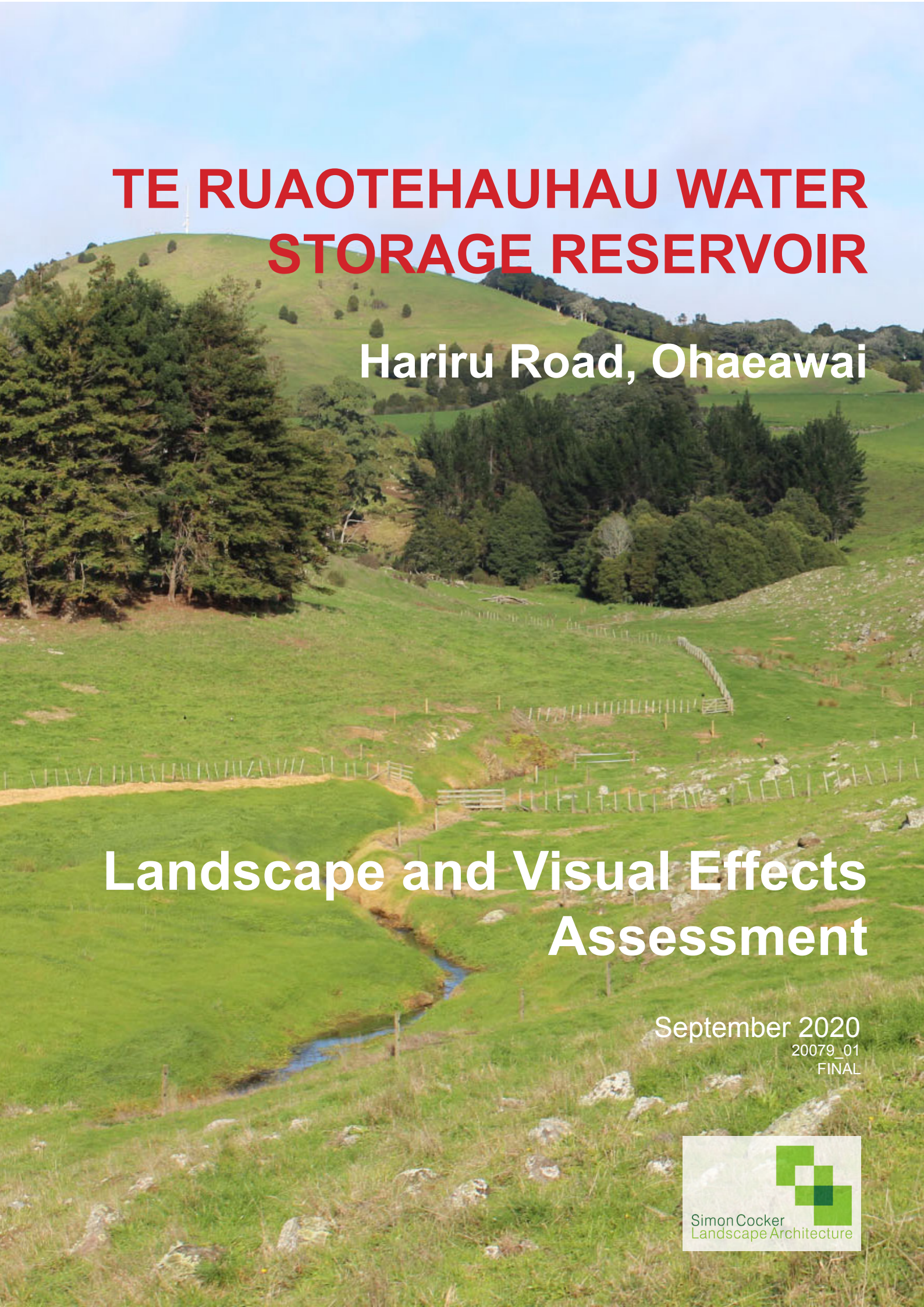
Appendix G. Landscape and Visual Amenity Assessment Report



TE RUAOTEHAUHAU WATER STORAGE RESERVOIR

Hariru Road, Ohaeawai

Landscape and Visual Effects Assessment

September 2020

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FINAL

Simon Cocker
Landscape Architecture

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1.0 INTRODUCTION

Te Tai Tokerau Water Trust Board ('the applicant') have received provincial growth funding to provide improved water supply in Northland. Williamson Water and Land Advisory (WWLA) is leading the provision of a range of technical services to inform the project. Simon Cocker Landscape Architecture (SCLA) has been engaged to prepare this assessment of landscape and visual amenity effects associated with a proposed water supply reservoir (Te Ruaotehauhau Stream Water Supply Reservoir) off Hariru Road, Ohaeawai, in the Far North District.

In brief, the applicant proposes to construct a new water supply reservoir, by constructing a dam across the Te Ruaotehauhau Stream, and inundating a section of the Ruaotehauhau Stream, including headwaters, and surrounding land (Figure 1 in Appendix 1). The proposed reservoir will have a 21.0m high embankment and a storage volume of 1,400,000 cubic metre (m^3) (at full supply level).

It is the opinion of the author that the proposal is appropriate from a landscape and visual perspective.

2.0 ASSESSMENT METHODOLOGY

The assessment has been prepared by a Registered Landscape Architect with reference to the Quality Planning Landscape Guidance Note 1 and its signposts to examples of best practice, which include:

- Best Practice Note 10.1, Landscape Assessment and Sustainable Management, New Zealand Institute of Landscape Architects (2010).
- Guidelines for Landscape and Visual Impact Assessment 3rd Edition, Landscape Institute (UK) and IEMA (2013).
- Information Requirements for the assessment of Landscape and Visual Effects, Auckland Council (2017).

In addition, this report has been prepared in accordance with the NZILA (New Zealand Institute of Landscape Architects) Code of Conduct[1].

Effects Ratings and Definitions

An outline of the effects ratings and definitions used in this assessment is provided in Appendix 2 – Landscape and Visual Assessment Methodology. In summary, the significance of effects identified in this assessment are based on a seven-point scale which includes very low; low; moderate – low; moderate, moderate – high, high, and very high. A rating of moderate to low equates to minor in terms of RMA terminology.

Desktop study and site visits

In conducting this assessment, a desktop study was completed which included a review of the relevant information relating to the landscape and visual aspects of the project. This information included:

- Northland Regional Policy Statement (2016);
- The Far North District Plan;
- Geotechnical and site suitability assessment MN06 water storage reservoir, Ohaeawai, prepared by Riley Consultants Ltd., dated 14 August 2020;
- Hydrology Assessment prepared by Williamson Water and Land Advisory, dated 10 March 2020;

[1] Contained in Appendix 1 of: http://www.nzila.co.nz/media/50906/registered_membership_guide_final.pdf

- Archaeological assessment of the proposed MN06 Water Storage Reservoir, prepared by Geometria Limited, 24 August 2020;
- Te Ruatehauhau Stream Water Storage Reservoir. Assessment of Ecological Effects, prepared by Puhoi Stour dated 28 August 2020;
- Cultural Impact Assessment, prepared by xxxxxx, and dated xxxxxxx;
- Topographical survey plans, and;
- Aerial photography, Far North District Council GIS mapping, Google Earth and Streetview

Two site visits were undertaken. The first on 10 June 2020, and the second on 13 July 2020.

3.0 THE PROPOSAL

The proposal is shown on Figures 2a, and 2b in Appendix 1. The proposed reservoir, when the water level is at the full supply level will store a volume of approximately 1,400,000m^3. The proposal is described in detail in the application and comprises the following elements of relevance to this assessment:

Vegetation clearance

The total quantity of indigenous vegetation loss is 1.46 ha, with an additional 0.75 ha of volcanic boulderfield, 1.32 ha of exotic forest and 0.22 ha of wet pasture removal.

Embankments, Excavation and filling

The dam embankment will approximately 21.0m high in the main valley section and around 400m long. Only the central portion (~50m in length) is in the order of 10m to 20m high, with majority of its length on the left abutment – which extends some 300m to the north west – being generally less than 5m or 10m.

The embankment will have up- and down-stream slope batters of 1V:3H (horizontal : vertical) and 1V:2H with a 5m wide mid-height bench, and 5m wide crest. There is potential for the down-stream slope batter of the left hand embankment to be 'eased' to a more gentle slope so that its integrates more effectively with the contextual topography.

A low-level conduit installed within the valley floor at the toe of the left abutment would provide temporary flood diversion during construction, and house both a residual flow pipe and supply pipes. A flood spillway is envisaged to be formed beyond the right abutment, discharging to the stream approximately 200m below the dam.

The embankment will comprise a riprap facing on the upstream side of the 3H:1V embankment slope to prevent erosion of the dam face, and the downstream dam face will be maintained in grass.

No material is intended to be exported from the site, and only a small amount of specialist filter aggregate and riprap imported for the dam embankment and reservoir formation.

Overall, it is understood that the total volume of earthworks will be 255,480m^3. This will comprise the following:

- Spillway cut 92,610 m^3
- Foundation cut 19,600 m^3 (Strip 500mm generally, 3m key in central section)
- Dam embankment fill 143,270 m^3 (includes backfilling stripped & key excavation)

As illustrated on Figure 2b, potential borrow sites have been identified on the spurs to the south west of the reservoir. It is recommended that, where material is excavated for use in the dam construction, that the final landform be shaped to reflect, and integrate with the adjoining unmodified landform. These areas shall be covered with topsoil and regrassed for grazing, or planted with trees, or native revegetation.

Landscape and visual mitigation

Opportunities exist for the revegetation of the riparian margins of the reservoir, particularly where watercourses flowing into the storage area provide opportunities for riparian plantings and / or linking existing pockets of wetland and remnant forest fragments. This element of the proposal will be developed in conjunction with the ecologist and with land owners. With regard to the latter, it is understood that the various landowners have a range of perspectives on the use of land bordering the future reservoir. A setback will however, be required to prevent stock from affecting water quality. Preferably, this riparian set back will be planted with native species, so that in the longer term, the need for ongoing management and weed control. Where possible, the landscape mitigation planting will be undertaken so that it also functions as a part of the ecological terrestrial offset and compensation package.[2]

The revegetation planting depicted in Figure 2c provides an indicative illustration of how such revegetation planting could occur. The suggested areas of revegetation respond to the hydrological and landscape patterns, seeking to enhance the landscape values of these existing features, and the reservoir as proposed, as well as taking into consideration the desire to provide screening of the reservoir and associated earthworks from the wider environment. The plant palette and mixes will reflect locally occurring ecosystem types and species. Plant material will be sourced locally.

It is also intended that the areas of proposed revegetation will assist with the integration of the reservoir into the landscape when viewed from locations such as Hariru Road and properties to the north. The plantings will reflect the landform, reinforcing the natural patterns and thereby enhancing the 'natural' appearance of the reservoir.

In addition, the areas of revegetation will fragment views of the reservoir so that the more 'artificial' elements – such as the linear form of the embankment which extends to the north west from the dam structure – will be softened and their 'artificiality' masked.

Another feature of the reservoir that has the potential to detract from its natural appearance is the fluctuation in water levels during periods of increased water use. Where dry periods extend over several winter and summers, this may result in the 'draw-down' largely draining the reservoir. The usual draw-down range will however, be less dramatic, but fluctuations will result in the revealing of a 'tide mark' around the reservoir margin as the water level falls.

Whilst riparian plantings around the reservoir margins will serve to mask the 'tide mark' to some extent, it is also recommended that rock 'won' during construction be placed within the 'zone of fluctuation', and on the riparian margins of the reservoir. Scattered rock within areas of pasture is a feature of the landscape, and this measure will assist with reducing the visual contrast when water levels fluctuate. In addition, as is described in the ecological report[3] that such rock-fields also have the potential to provide ecological benefits.

It is recommended that the mitigation planting proposal will be refined in conjunction with the project ecologist. Quantify the amount of vegetation and wetland enhancement required to offset the effects of the reservoir. This will require further exploration of suitable offset sites near to the proposed reservoir, and identification of a potential compensation site for swamp forest loss. Furthermore, it is recommended that ecological terrestrial offset compensation package / restoration management plan include consideration of landscape and visual mitigation in its development, or that a standalone

[2] Puhoi Stour. *Te Ruatehauhau Stream Water Storage Reservoir. Assessment of Ecological Effects*, 28 August 2020. Section 5.2
[3] Ibid. Section 5.2

Landscape and Visual Mitigation Plan be required as a condition of consent. This plan should be consistent with any ecological management plans required by the consent.

4.0 EXISTING ENVIRONMENT

4.1 Location and land ownership

The subject site is located within a property identified as Lot 2 DP 442506, Sec 16S Remuera SETT, Sec 12S Remuera SETT, Lot 3 DP 97908 and Okokako and is located approximately 2.0km to the west of Ohaeawai.

4.2 Topography, geology and soils of the site and its context

The landscape of the area is characterised by its volcanic origins, with volcanic cones forming focal features. These also have strong associations with the cultural heritage of the area, conveyed by pa site formations on many of the prominent cones.

Basalt scoria cones and extensive basalt flows and shields have erupted in this area over the last 10 million years. Although the older (pre 2 Ma) cones have disappeared, eroded remnants of the flows now form upstanding plateaux, extending from Okaihau to Kerikeri and north to Whangaroa. Deep, subtropical weathering of these features has produced the rich volcanic soils that nurture Kerikeri's orchards and crops.

In the last half-million years, 12 small basalt volcanoes have erupted in the southern part of the field, forming a cluster of scoria cones around Kaikohe. The youngest volcano is Tauanui, 10 km south of Kaikohe, which 60,000 years ago produced a high scoria cone and a lava flow that flowed 19 km down the Taheke Valley towards the Hokianga Harbour. The field includes a number of small rhyolite domes (Putahi, 381m, Tarahi, 388m and Haruru, 350m), overlooking Lake Omapere. It is understood that the field is considered dormant, and not extinct.

As is illustrated in Plate 1 below, the Kaikohe volcanic centre is marked by a scoria cone at Memorial Hill that reaches an elevation of 282 m and is approximately 1 km in diameter. The basalt flows associated with the Kaikohe volcanic centre, defined as the Kaikohe Basalt, extend to the south and south-east of the cone splitting into two main lobes. One lobe extends south-west along State Highway 12 and the other extends south along Mangakahia Road to the Punakitere River. These lobes appear to follow pre-existing valleys.

The Kaikohe Basalt slopes from north to south, falling from an elevation of approximately 200m near the base of the scoria cone to 160 m near the southern limit of the basalt. Most of the Kaikohe Basalt ranges between 180m and 160m with steeply sloping edges.

The geotechnical assessment[4] described the site as being underlain by basalt lava flows and occupies a volcanic plateau formed by lava flows inferred to originate from three prominent scoria cones: Tarahi Volcano to the south (refer to photo 1), Maungakawakawa to the south-west (refer to photo 2), and Te Ahuahu to the north-west (refer to photo 3). More specifically, the site is located on the lower northern slopes of the Tarahi volcano, which forms the highest scoria cone in the Kaikohe Volcanic Field, approximately 140m above the surrounding flows. The lava flows to the east and

[4] Riley Consultants. *Geotechnical and site suitability assessment MN06 water storage reservoir, Ohaeawai* 14 August 2020. Section 4.0

north east of this feature form a series of spurs which project into the site (refer to Figure 1), whilst further to the north and east, beyond the extent of the lava flows, the landform assumed a more gently undulating character.

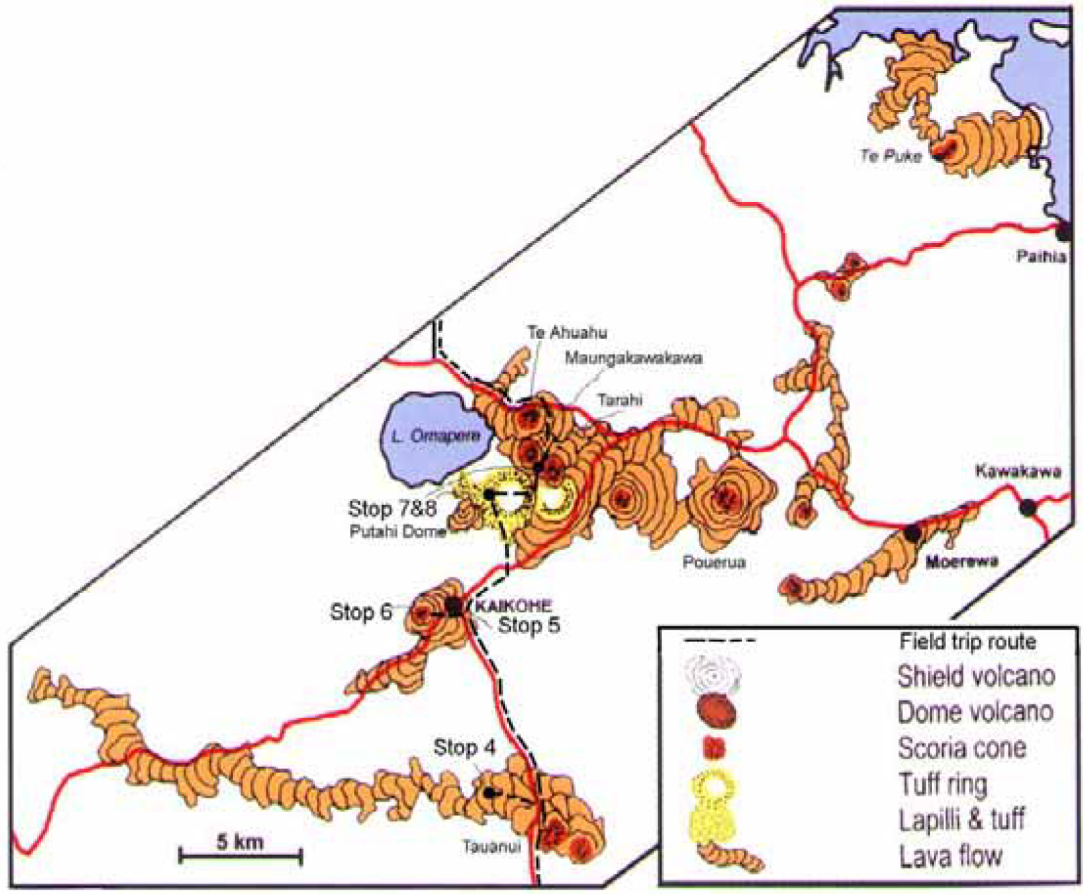


Plate 1: Map of the Kaikohe Basaltic Volcanic Field (Hayward 2002, after Mulheim 1973)

The Maungakawakawa volcano to the west forms a 60m high scoria cone that breached to the north-west and formed radially running volcanic flows. The Te Ahuahu volcano forms a prominent scoria cone rising 100m above its east-west trending flows below.

The topography falls gradually to the south east, and from Hariru Road, long views are possible across the landscape in this direction (refer to photo 4)

The geotechnical report notes that the overlying soil types for the Whangaroa-Kaikohe area are underlain by Waiotu friable clay towards the northern side of the site, Whakapai friable clay loam to the south, Ruatangata friable clay towards the west and likely Otaha clay further to the west of the site.

4.3 Hydrology of the site and its context

The site is contained within the catchment of the Te Ruaotehauhau Stream which flows to the east to join the Pekapeka Stream some 500m to the south of Ohaeawai. The Pekapeka Stream subsequently discharges into the Waiaruhe River, and subsequently into the Waitangi River.

The catchment boundary of the Te Ruaotehauhau Stream is defined by the ridge which links Te Ahuahu, Maungakawakawa and Tarahi and is traced by Hariru Road.

4.4 Vegetation of the site and its context

Photos 1 – 4 illustrate how the wider context of the site is primarily under pasture and is grazed. Within the site this consists of pasture grass, pugged and wet pasture.

Pockets of native forest, and groves of trees are in evidence. Often these are associated with less productive grazing land, such as steeper slopes, as fingers of riparian vegetation within gullys, or on the flatter, low-lying and wet areas of pasture. With respect to the latter, remnants of swamp forest are a characterising feature of the area. Exotic vegetation, including pine plantations, shelterbelts and barberry hedges also lend structure and impart a impression of a productive landscape.

Whilst only seen as occasional features within the Te Ruaotehauhau basin, shelterbelts are more prevalent to the west, to the north, to the north east and to the east of the site, reflecting those areas where soils are suitable for horticultural production.

The ecological report describes a number of iindigenous terrestrial ecosystem types within the vicinity of the Site[5], these include:

- Pūriri forest on basalt volcanic substrate;
- Riparian swamp forest;
- Secondary broadleaf forest with old-growth remnants, and;
- Tōtara treeland.

The documents states that:

Stock have access to areas of pasture grass and some areas of indigenous vegetation, however much of the indigenous vegetation is fenced from stock and therefore in good ecological condition.

A small area of grazed rautahi (Carex secta) is present as riparian wetland along the Te Ruaotehauhau Stream margin, and kutakuta wetland (Eleocharis sphacelata) is present on the margin of a farm pond in the south-western corner of the proposed reservoir. Wetlands, regardless of ecological condition, are a nationally threatened ecosystem type, with 10% of the original wetland extent remaining nationally.

4.5 Land use of the site and its context

As described above, the primary land use through the environs of the site is pastoral grazing, although pockets of horticultural production are signaled by shelterbelts along State Highway 1 to the east and to the west, between Hariru Road and Lake Omapere.

The township of Ohaeawai forms a cluster of settlement some 2.0km to the east, whilst rural residential properties of between 1.0ha and 10ha in area are aligned along State Highway 1 and State Highway 12 to the east, south east and south..

[5] Ibid Section 5.1

In the vicinity of the site, the majority of properties are in larger landholdings, although some smaller properties between 5,000 – 1.5ha in area are scattered along Hariru and Remuera Settlement Road. Scattered clusters of settlement are observed at the northern end of Hariru Road (near the junction with the State Highway) and along an elevated section of Hariru Road on the eastern side of Maungakawakawa. This latter linear cluster extends south along the road toward its junction with Remuera Settlement Road.

Recent subdivision of rural residential properties is in evidence on Hariru Road (Sec 12S Remuera SETT).

4.6 Visual catchment and extent of visibility

The visual catchment of the site encompasses a relatively limited areas. To the north west, west, south west and south it is contained by landform, this being the volcanic features of Te Ahuahu, Hariru, Tarahi and the catchment boundary ridge linking these three features (refer to Figure 3).

The linking ridge is traced by Hariru Road, and intermittent glimpses into the valley are possible, although north easterly and easterly trending spurs frequently interrupt views. A number of dwellings are located on Hariru Road and offer long views over the landscape to the north east and east.

To the north and north east the landform is gently undulating, and whilst there is the potential for more extensive views from these directions, vegetation including shelterbelts screens the site from State Highway 1.

4.6.1 Viewing audiences

Public viewing audiences

- Road users and pedestrians on Hariru Road

Private Viewing audiences

- Occupants of dwellings located to the north west of the site (within Lot 1 DP 442506, Sec 5S Remuera SETT,
- Occupants of dwellings located to the west of the site (within Lot 1 DP 378424, Sec 50S Remuera SETT, Lot 1 DP 157098, Pt Hariru B and Poukai A, Sec 58S Remuera SETT, and Lot 1 DP 322598)

4.7 Statutory context

This section provides a brief statutory assessment against the matters set out in section 104(1) of the Resource Management Act 1991 (RMA) and other relevant planning documents with regards to the proposed works, including:

- Part 2 of the RMA
- Northland Regional Policy Statement
- Far North District Plan

4.7.1 Resource Management Act 1991

Part 2 of the Act requires that the proposed activity must meet the purpose of the Act as outlined in Section 5 "to promote the sustainable management of natural and physical resources."

Section 6 of the Act identifies 8 matters of national importance to be had regard to in achieving the purposes of the Act. The following are of relevance to the proposal:

- The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development

Section 7 of the Act identifies 11 other matters to be had regard to in achieving the purposes of the Act. The following are of relevance to the proposal:

- The maintenance and enhancement of amenity values; and
- intrinsic values of ecosystems; and
- the maintenance and enhancement of the quality of the environment.

4.7.3 Northland Regional Policy Statement (2016)

A number of Outstanding Natural Features located within the vicinity of the site are identified in the Northland Regional Policy Statement. This includes the the Maungakawakawa Scoria Cone, the Tarahi Scoria Cone, the Te Ahuahu Volcanic Cone, the Maungaturoto Volcanic Cone, Waimitimiti Scoria Mounds, Te Pua Crater and Flows and Lake Omapere.

3.14 Natural character, outstanding natural features, outstanding natural landscapes and historic heritage.

Identify and protect from inappropriate subdivision, use and development;

(a) The qualities and characteristics that make up the natural character of the coastal environment, and the natural character of freshwater bodies and their margins;
(b) The qualities and characteristics that make up outstanding natural features and outstanding natural landscapes;
(c) The integrity of historic heritage.

4.6 Managing effects on natural character, features / landscapes and heritage

(1) …….

(2) Outside the coastal environment avoid significant adverse effects and avoid, remedy or mitigate other adverse effects (including cumulative adverse effects) of subdivision, use and development on the characteristics and qualities of outstanding natural features and outstanding natural landscapes and the natural character of freshwater bodies. Methods which may achieve this include:

a) In outstanding natural landscapes, requiring that the location and intensity of subdivision, use and built development is appropriate having regard to, natural elements, landforms and processes, including vegetation patterns, ridgelines and freshwater bodies and their margins;
b) In outstanding natural features, requiring that the scale and intensity of earthworks and built development is appropriate taking into account the scale, form and vulnerability to modification of the feature;
c) Minimising, indigenous vegetation clearance and modification (including earthworks / disturbance and structures) to natural wetlands, the beds of lakes, rivers and their margins.

(3) When considering whether there are any adverse effects on the characteristics and qualities of the natural character, natural features and landscape values in terms of (1)(a), whether there are any significant adverse effects and the scale of any adverse effects in terms of (1)(b) and (2), and in determining the character, intensity and scale of the adverse effects:

a) *Recognise that a minor or transitory effect may not be an adverse effect;*
b) *Recognise that many areas contain ongoing use and development that:*

   ii. *Were present when the area was identified as high or outstanding*
   iii. *or have subsequently been lawfully established*
   iv. *May be dynamic, diverse or seasonal;*

c) *Recognise that there may be more than minor cumulative adverse effects from minor or transitory adverse effects; and*
d) *Have regard to any restoration and enhancement on the characteristics and qualities of that area of natural character, natural features and/or natural landscape.*

4.7.4 Far North District Plan

The objectives and policies of relevance to this assessment are as follows:

8.3.1 To promote the sustainable management of natural and physical resources of the rural environment.

8.3.3 To avoid, remedy or mitigate the adverse and cumulative effects of activities on the rural environment.

8.3.4 To protect areas of significant indigenous vegetation and significant habitats of indigenous fauna.

8.3.5 To protect outstanding natural features and landscapes.

8.3.7 To promote the maintenance and enhancement of amenity values of the rural environment to a level that is consistent with the productive intent of the zone.

8.4.2 That activities be allowed to establish within the rural environment to the extent that any adverse effects of these activities are able to be avoided, remedied or mitigated and as a result the life supporting capacity of soils and ecosystems is safeguarded and rural productive activities are able to continue.

8.4.3 That any new infrastructure for development in rural areas be designed and operated in a way that safeguards the life supporting capacity of air, water, soil and ecosystems while protecting areas of significant indigenous vegetation and significant habitats of indigenous fauna, outstanding natural features and landscapes.

8.4.4 That development which will maintain or enhance the amenity value of the rural environment and outstanding natural features and outstanding landscapes be enabled to locate in the rural environment.

8.4.6 That areas of significant indigenous vegetation and significant habitats of indigenous fauna habitat be protected as an integral part of managing the use, development and protection of the natural and physical resources of the rural environment.

8.4.8 That, when considering subdivision, use and development in the rural environment, the Council will have particular regard to ensuring that its intensity, scale and type is controlled to ensure that adverse effects on habitats (including freshwater habitats), outstanding natural features and landscapes on the amenity value of the rural environment, and where appropriate on natural character of the coastal environment, are avoided,

remedied or mitigated. Consideration will further be given to the functional need for the activity to be within rural environment and the potential cumulative effects of non-farming activities.

Rural Production Zone

8.6.3.1 To promote the sustainable management of natural and physical resources in the Rural Production Zone.

8.6.3.3 To promote the maintenance and enhancement of the amenity values of the Rural Production Zone to a level that is consistent with the productive intent of the zone.

8.6.3.4 To promote the protection of significant natural values of the Rural Production Zone.

8.6.4.2 That standards be imposed to ensure that the off-site effects of activities in the Rural Production Zone are avoided, remedied or mitigated.

8.6.4.3 That land management practices that avoid, remedy or mitigate adverse effects on natural and physical resources be encouraged.

8.6.4.4 That the type, scale and intensity of development allowed shall have regard to the maintenance and enhancement of the amenity values of the Rural Production Zone to a level that is consistent with the productive intent of the zone.

12.1.2

12.1.2.1 To protect outstanding landscapes and natural features from inappropriate, subdivision use and development.

12.1.2.2 To protect the scientific and amenity values of outstanding natural features.

12.1.2.3 To recognise and provide for the distinctiveness, natural diversity and complexity of landscapes as far as practicable including the complexity found locally within landscapes and the diversity of landscapes across the District.

12.1.4 To avoid adverse effects and to encourage positive effects resulting from land use, subdivision or development in outstanding landscapes and natural features and Maori cultural values associated with landscapes.

12.1.5 That both positive and adverse effects of development on outstanding natural features and landscapes be taken into account when assessing applications for resource consent.

12.1.5 That activities avoid, remedy or mitigate significant adverse effects on both the natural and the cultural values and elements which make up the distinctive character of outstanding natural features and landscapes.

12.1.5 That the cumulative effect of changes to the character of Outstanding Landscapes be taken into account in assessing applications for resource consent.

12.1.6 That the visibility of Outstanding Landscape Features, when viewed from public places, be taken into account in assessing applications for resource consent.

12.1.7 That the adverse visual effect of built development on outstanding landscapes and ridgelines be avoided, remedied or mitigated.

12.1.8 That activities avoid or mitigate adverse effects on the scientific and amenity values associated with outstanding natural features.

12.1.9 That the diversity of outstanding landscapes at a District-wide and local level be maintained and enhanced where practicable.

12.1.10 That the trend is towards the enhancement rather than the deterioration of landscape values, including the encouragement of the restoration of degraded landscapes.

12.1.11 That the high value of indigenous vegetation to Outstanding Landscapes be taken into account when assessing applications for resource consents.

12.1.12 That landscape values be protected by encouraging development that takes in account:

(a) the rarity or value of the landscape and/or landscape features;
(b) the visibility of the development;
(c) important views as seen from public vantage points on a public road, public reserve, the foreshore and the coastal marine area;
(d) the desirability of avoiding adverse effects on the elements that contribute to the distinctive character of the coastal landscapes, especially outstanding landscapes and natural features, ridges and headlands or those features that have significant amenity value;
(e) the contribution of natural patterns, composition and extensive cover of indigenous vegetation to landscape values;
(f) Maori cultural values associated with landscapes;
(g) the importance of the activity in enabling people and communities to provide for their social, economic and cultural well-being.

Overall it is understood that the activity status of the application is non-complying.

5.0 IDENTIFIED LANDSCAPE VALUES

The identified landscape values are depicted on Figure 4. The subject site is not subject to any landscape overlay within the Northland Regional Policy Statement, in the Kaipara District Plan or in any non-statutory documents.

5.1 Ecological values

Located some 750m to the west of the site, a number of forest remnants constitute virtually the only forest in the catchment of Lake Omapere. Identified as Remuera Settlement Road Remnants (P05/038), the remnants comprise fragmented totara, towai, taraire and puriri forest growing on the flanks of, and within the crater of Maungakawakawa.

The ecology report assesses the terrestrial ecological values as follows:

Puriri forest: Mature pūriri forest is one of Northland's rarest ecosystem types, with 1000 ha remaining and less than 50 ha protected. Volcanic broadleaf forests (e.g. pūriri forest) has been identified as a priority area for protection24. This forest type typically supports indigenous lizards, keystone birds such as kukupa (*Hemiphaga novaeseelandiae*) and can provide habitat to native bats and kauri snails. It is therefore considered as having very high ecological value.

Riparian swamp forest: Swamp forest habitats have reduced in extent nationally due to the draining of wetlands and habitat clearance. Swamp forest is regionally under-represented with two intact examples left in the Ecological District, constituting 1.5% of natural areas left in the Ecological District. The presence of Threatened – Nationally Critical swamp maire further increases the quality and importance of this habitat……This ecosystem type is therefore considered of very high ecological value.

Secondary broadleaf forest with old growth remnants: Overall, this habitat is in good ecological condition with stock exclusion resulting in regeneration of indigenous broadleaved species among remnant mature trees. Secondary broadleaf forests provide habitat for indigenous bats, birds, lizards and kauri

snails. The relatively small extent of this ecosystem type, and predominantly regenerating nature result in this ecosystem being considered of moderate ecological value. Kānuka is considered as having very high ecological value due to its threat classification of Threatened – nationally vulnerable.

Totara treeland: No threatened or at-risk species were present in this ecosystem type, but tōtara treelands may provide habitat for native bats, birds and lizards and are therefore considered of moderate ecological value. Tōtara treelands are currently providing buffering and shading to Waitaia Stream and Te Ruaotehauhau Stream.

Volcanic boulderlands: The volcanic boulderfields are severely degraded due to stock impacts and provide little habitat to native fauna. However native skinks may utilise boulders as shelter and basking, and due to their status as endangered are therefore classified as having high ecological value.

Exotic forest: For the purposes of this assessment we have conservatively assumed that indigenous bats and North Island brown kiwi are present and therefore exotic forest is classified as having moderate ecological value.

Indigenous dominated wetlands: Given that the wetlands were of a small extent but dominated by indigenous species, both are considered as having high ecological value.

Wet pasture grass: Under the Proposed Regional Plan for Northland pasture wetlands dominated by rushes are not considered a 'Natural Wetland' and are therefore considered of low ecological value.

The ecological values assigned in the ecological report for bats, avifauna, herpetofauna, and invertebrates is very high, high, high and high respectively.

5.2 Landscape values

Far North Landscape Assessment

The site is contained within the Waimate / Okaihau Area landscape unit (Unit T23) as delineated in the Far North District Landscape Assessment[6]. The unit is contained within the Heritage landscapes category, and is described as having an over-riding strong heritage signature where a range of elements contribute to contribute to the sense of history. This includes evidence of Maori and European heritage, conveyed by pa site formations on volcanic cones, and the prevalence of historic buildings, stone walls and thorn hedges.

The assessment notes the contribution of vegetation to the landscape character – groves of mature indigenous vegetation, as well as mature exotic trees associated with the historic homesteads.

[6] LA4 Landscape Architects. *Far North District Landscape Assessment*. 1995. P.32.

The assessment assigns the unit a Sensitivity of 6 which, using the scale within the document, relates to a ranking of 'outstanding'. It lists the following elements that contribute to this rating:

- A pervading heritage character;
- Historic buildings and associated fences / gardens;
- Groves of mature native trees;
- Notable exotic trees that are associated with historic buildings, particularly specimens of oak and Norfolk Island pine.

Northland Regional Policy Statement

The RPS identifies a number of features in the vicinity of the site as 'Outstanding'. The major source of information used to inform the RPS when identifying landscape features has been the "Inventory (and maps) of Important Geological Sites and Landforms in the Northland Region", Geological Society of New Zealand unpublished report 95/2, edited by J Kenny and B Hayward (1995).

In the vicinity of the subject site, the landscape features are as follows:

Maungakawakawa Scoria Cone (Outstanding Natural Feature). This feature is described as being very good example of small breached scoria cone in the Kaikohe Volcanic Field which is prominent on the skyline when viewed from the east. The cone is centrally located with flows running radially from the vent.

Tarahi Scoria Cone (Outstanding Natural Feature). Located approximately 500m to the south of the site, this feature is decribed as being the highest and most prominent of the scoria cones in the Kaikohe Volcanic Field. This steep-sided scoria cone (750 m diameter) is breached to the NNW, stands approximately 140 m above the surrounding flows, 390 m ASL, and is highest in the Kaikohe Volcanic Field. There is a VHF station on the summit.

Te Ahuahu Volcanic Cone (Outstanding Natural Feature). The foot of this feature is traced by Hariru Road, and is located some 500m to the north west of the site. The New Zealand Geopreservation Inventory describes the feature as being one of the five highest and most prominent steep-sided scoria cones in the Kaikohe Volcanic Field. It comprises a single circular cone, 500 m in diameter, with an E-W trending flow covering a total area of 1.5 square km. The cone stands 100 m above the surrounding plateau, 380 m ASL, but the small crater is shallow.

Within the wider landscape context of the site, the volcanic and other features include the Maungaturoto Volcanic Cone (Outstanding Natural Feature) (2.0km to the south east), Waimitimiti Scoria Mounds (Outstanding Natural Feature) (1.7km to the south west, Te Pua Crater and Flows (Outstanding Natural Feature) (2.0km to the south west) and Lake Omapere (Outstanding Natural Feature) (2.5km to the west).

Far North District Plan

The Far North District Plan identifies the Maungakawakawa Scoria Cone, the Tarahi Scoria Cone, the Te Ahuahu Volcanic Cone, the Maungaturoto Volcanic Cone, Waimitimiti Scoria Mounds, Te Pua Crater and Flows and Lake Omapere within Appendix 1A (Schedule of Outstanding Natural Features) and Appendix 1B (Schedule of Outstanding Landscape Features).

5.3 Archaeological values

The archaeology report[7] states that the density of archaeological sites is high due to the highly fertile volcanic soils suitable for pre-Contact Maori horticultural activities.

It notes that

"*the Te Ahuahu-Ohaeawai-Kaikohe-Waimate North area was an important area of pre-Contact Maori settlement, and European/Maori interaction in the 19th century. The area was also the site of a major battle of the Northern War of 1845-46, between forces allied with the British under Tamati Waka Nene, and those of Hone Heke. The wider landscape is highly archaeologically, historically and culturally significant*."

Although the site contains no scheduled items of cultural significance to Maori (as listed in Appendix 1F of the District Plan), Te Ahuahu and Maungakawakawa are identified as MS 09-04 and MS 09-27 respectively.

The site inspection, undertaken by Geometria revealed an extensive area of stone horticultural mounds on the northern side of the proposed reservoir, over an area of approximately 10ha.

It describes these features as pre or protohistoric Maori horticultural activity on the highly productive soils of the area, probably associated with the nearby kainga (open settlements or villages) and pa sites recorded nearby.

The inspection also identified two possible house floors or storage pits, stacked dry stone walls are also present within the proposal area which it surmises may or may not be archaeological, and taro growing within the stream system.

5.4 Cultural values

The archaeological report notes that the Te Ahuahu-Ohaeawai-Kaikohe-Waimate North area was an important area of pre-Contact Maori settlement, and European/Maori interaction in the 19th century[8].

To be completed following receipt of CIA.

6.0 ASSESSMENT OF LANDSCAPE EFFECTS

6.1 Background

Preceding sections describe the characteristics of the property and site, its setting and the proposal (including mitigation). The purpose of this section is to define the effects of the application upon the site and setting, to consider how the proposal would impact upon the experience of people viewing the development from outside of the site, and to comment upon the level of landscape, natural character, and visual effects.

Landscape change can, but does not necessarily result in adverse visual effects. Natural and human induced change is a constant within the landscape. The key is to manage this in such a way that any adverse visual effects are avoided, remedied or mitigated.

[7] Geometria. *Archaeological assessment of the proposed MN06 Water Storage Reservoir*, 24 August 2020
[8] Ibid. Section 5.2.

6.2 Assessment of Effects

The effects covered in this assessment, include those that can occur in relation to physical features, viewing audiences and visual amenity and/or on the site's contribution to the existing landscape character and amenity values, as follows:

- Landscape character and amenity effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced. This may in turn affect the perceived value ascribed to the landscape.
- Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity.

Landscape and visual impacts can result from change in the components, character or quality of the landscape. Usually these are the result of landform or vegetation modification or the introduction of new structures, facilities or activities. All these impacts are assessed to determine their effects on landscape character and quality, rural amenity and on public and private views. In this report, the assessment of potential effects is based on a combination of the landscape's sensitivity and visibility and the nature and scale of the development proposal.

The nature of landscape and visual effects generated by any particular proposal can, therefore, be:

- Positive (beneficial), contributing to the visual character and quality of the environment.
- Negative (adverse), detracting from existing character and quality of environment; or
- Neutral (benign), with essentially no effect on existing character or quality of environment.

Landscape, and Amenity effects can be rated on a seven-point scale from Very High, through to Very Low.

The degree to which landscape and visual effects are generated by a development depends on several factors, these include:

- The degree to which the proposal contrasts, or is consistent, with the qualities of the surrounding landscape.
- The proportion of the proposal that is visible, determined by the observer's position relative to the objects viewed.
- The distance and foreground context within which the proposal is viewed.
- The area or extent of visual catchment from which the proposal is visible.
- The number of viewers, their location and situation (static or moving) in relation to the view.
- The backdrop and context within which the proposal is viewed
- The predictable and likely known future character of the locality
- The quality of the resultant landscape, its aesthetic values and contribution to the wider landscape character to the area.

Change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. The current proposal, which seeks to introduce a reservoir into the landscape could equally be perceived by an individual as a positive change, or one that is negative. The response depends on the attitude of the individual, and the values that they assign to the affected landscape.

Whilst acknowledging that individuals may experience a positive response to the proposed landscape change, in this assessment, the approach has been taken to assume that individuals will experience a negative response, and assess the level of effect on that basis.

Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways, these changes are both natural and human induced. What is important in managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use. The aim is to provide a high amenity environment through appropriate design outcomes, including planting that can provide an adequate substitution for the currently experienced amenity.

6.2.1 Biophysical – Abiotic attributes

The key abiotic attributes of the site include the landform, geology, and water catchments. Overall, modification as a result of human processes or human induced processes has been limited to the drainage of some areas of lower lying land, earthworks for the construction of accessways.

The total earthworks volume, allowing for bulking, is expected to be in the order of 255,480m^3. This will comprise a spillway cut of 92,610 $m^{3,}$ a foundation cut of 19,600 m^3 (this includes the topsoil strip of approximately 500mm, and a 3.0m key in central section), and the dam embankment fill of 143,270 m^3 (this includes backfilling stripped & key excavation).

The form and location of the dam is illustrated on Figures 2a, 2b and 2c. The dam will be constructed across a narrow portion of the gully landform.

The proposal will result in a moderate level of localised change in the abiotic attributes – including the changes to the natural landforms and watercourse. Principally, the changes to the landform will result from excavation for the spillway and for the purpose of winning material for the dam construction, and the construction of the dam. Despite the moderate level of change locally, when considered in the context of the wider catchment, the changes will be relatively modest.

6.2.2 Biophysical – Biotic attributes

The biotic attributes of the site are the living organisms which shape an ecosystem.

The ecological report describes in detail the assessed level of effect on the values of the site. It determines that a high level of effect will result from each of the following; the removal of 0.47 ha pūriri forest, from the removal of 0.32 ha swamp forest, 0.75 ha of volcanic boulderfield. A moderate ecological effect will result from each of the following; the removal of 0.44 ha secondary broadleaf forest, the removal of 0.14 ha tōtara treeland, the removal of 1.2 ha of exotic forest and the removal of rata vines and kānuka.

A low ecological effect will result from each of the following; removal of 0.03 ha rautahi wetland, removal of 0.05 ha of kutakuta wetland, removal of 0.22 ha of wet pasture and removal of mānuka

Removal of nationally Threatened swamp maire will result in a very high ecological effect.

The ecological assessment concludes that the overall level of ecological effects on vegetation can be offset and compensated such that 'No Net Loss' of vegetation values can be achieved.

With regard to the adverse ecological effect on fauna, the assessment determines that the effect on bats and kiwi will be very high, the effect on forest birds, the New Zealand pipit and kauri snail will be high, the effect on pacific gecko will be moderate, and the effect on tui and copper skinks will be low.

With the exception of bats and kiwi (more information is required), the assessment states that the above effects can be managed, avoided or offset through management plan mechanisms, or other measures[9].

6.2.3 Experiential and perceptual attributes

Experiential attributes comprise the interpretation of human experience of the landscape. This includes visible changes in the character of the landscape – its naturalness as well as its sense of wildness and remoteness including effects on natural darkness of the night sky.

The proposed dam and area of water containment will be largely screened from the wider landscape (the visual catchment of the site is described in section 4.6 of this report), although more proximate views are possible from stretches of Hariru Road to the north west and west of the site, and from private viewpoints (individual dwellings) accessed from Haruru Road to the north, north west, west and south west.

The numbers of potentially affected individuals is small, however the degree of change experienced by a number of these individuals has the potential to be high.

As has been previously documented, change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect and the current proposal could equally be perceived by an individual as a positive change, or one that is negative. The response depends on the attitude of the individual, and the values that they assign to the affected landscape.

For the purpose of this assessment, and to provide a uniform 'worst case' assessment of the potential adverse effect, the assessment of visual amenity effects in section 7.0 has assumed a negative response.

Thus, with respect to the longer term effect of the dam structure and associated reservoir on experiential and perceptual attributes, the level of adverse effect is assessed as being high for the occupants of 5 dwellings, moderate to high for the occupants of 1 dwelling and moderate for the occupants of 2 dwellings. The balance of potentially affected individuals, including users of Hariru Road, will be affected to a low level.

The discussion in section 7.0 has noted that the level of effect can be mitigated to varying levels through the use of riparian planting and other mitigation measures.

It is noted that the potential adverse effects on experiential and perceptual attributes associated with the proposal have the potential to facilitate land use change. Land use change in itself may result in adverse effects on experiential and perceptual attributes. The Hydrological study states that the reservoir would be able to support some 387ha of horticultural land[10]. Whilst noting the potential for such a land use change to result in adverse effects on experiential and perceptual attributes, it is not possible – within the scope of this assessment – to determine the scale of change and the resulting level of effect.

[9] Ibid. 5.3.2
[10] Williamson Water and Land Advisory. *Hydrology Assessment*, 10 March 2020. Section 2.0

6.2.4 Cultural, spiritual and associative attributes

The archaeological report determines that approximately one hectare of stone mounds, and trenches, and any will be destroyed by the dam wall.

In addition, it states that approximately four hectares of stone mounds, trenches, and a two sections of stone wall will be inundated, and potentially destroyed depending on how the ground is prepared prior to inundation."

It notes that other features or artefacts may be present within the site and these may be affected.

The report concludes that, whilst not rare, the archaeological features observed are in otherwise good condition and are of moderate archaeological significance, and that the effects of the reservoir project on those features will be high.

Given the historic use of the site and its context, as evidenced by the findings of the archaeology report the community reports a sense of connection to the site and its wider context. This connection is not only associated with the historic use of the land, but is also linked to its ecological values.

It is understood that the community is supportive of measures to off-set biotic effects, and has expressed a desire to be afforded (restricted) access to the site and the remaining archaeological and cultural features.

To be completed on receipt of the CIA

6.2.5 Summary of Landscape Effects

The proposal will result in a moderate degree of localised change with respect to abiotic attributes, but that the change will be small when considered within the context of the wider landscape. The biotic effect of the proposal can be mitigated or offset. With regard to experiential and perceptual values, the proposal will result in a high, or moderate to high impact on a limited number of individuals, and the impact on spiritual, cultural and associative attributes will be high.

Overall therefore, it is assessed that the potential adverse landscape effects generated by the proposal will be moderate locally, once the mitigation measures are completed, and low when considered in the context of the wider environment, again, once the mitigation or offset measures have been implemented.

7.0 ASSESSMENT OF VISUAL AMENITY EFFECTS

As discussed in section 4.6 of this report, the visual catchment of the site is contained to the north, north west, west and south west by the volcanic cones and the ridge associated with these features. The site is visible from locations along Hariru Road, and from properties located along this road. Views from properties to the north east and east – along State Highway 1 are obscured by vegetation.

Whilst the landscape is more open and less elevated to the south east and east, the subject site is not visible from this area, with views blocked by landform.

The potentially affected groups are as follows:

Public viewing audiences

- Road users and pedestrians on Hariru Road

Views to the proposed dam structure are screened from public viewpoints, hidden by landform and vegetation, and as a result of the separation distances between the proposed structure and potential view locations.

The proposed reservoir has the potential to be glimpsed from the northern end of Hariru Road (refer to photos 4, 5 and 6). From these locations, the northern edge of the reservoir, and embankment may be visible across the relatively flat terrain, although due to the separation distance and intervening trees and shelter belts, the embankment and reservoir will not be a dominant element within the field of view.

From locations further to the south along Hariru Road, and to the north west of the site, views to the site are obscured by the spurs which trend to the north east from Maungakawakawa and Tarahi.

Similarly, from locations along Hariru Road to the west of the site, the site is obscured by the spur landforms. Views along the gullys, between the spurs are possible from locations on the road to the south west of the site (refer to photos 7 and 8).

Further to the south west along Hariru Road, and close to its junction with Remuera Settlement Road, views to the site are precluded by the rising landform of Tarahi. Tarahi, and its associated north easterly trending spurs also prevent views to the site from Remuera Settlement Road to the north of its junction with Hariru Road.

Views from State Highway 1 are blocked by vegetation.

It is the opinion of the author that, whilst viewers will appreciate a change when travelling along Hariru Road (particularly when the level of storage within the reservoir is at higher levels), the degree of change will be moderate and the level of potential adverse visual amenity effect will be low.

The level of potential adverse visual amenity effects experienced by users of Remuera Settlement Road and State Highway 1 will be nil.

Private Viewing audiences

- Occupants of dwellings located to the north west of the site,
- Occupants of dwellings located to the west and south west of the site

Occupants of dwellings located to the north west of the site

Dwellings located within Lot 1 DP 442506, Sec 5S Remuera SETT, and a building (Dog trials clubhouse) within Pt Sec 4S Remuera SETT occupy positions on the low-lying terrain between 500m – 800m from the nearest point of the proposed reservoir. Dwellings within the former two properties offer expansive views – albeit fragmented by vegetation – across the landscape to the east, south east and south. Occupants of these dwellings will experience fragmented views of the waterbody.

Viewed from Lot 1 DP 442506 (refer to photo 5), the change resulting from the proposal will be marked, with the reservoir forming a large proportion of the outlook to the south, replacing the existing spur and gully landform with its associated vegetation. In addition, the left embankment will be visible as part of the south easterly outlook from the dwelling. There is potential for the observer's attention to be drawn to this linear feature since it will 'define' the north eastern edge of the reservoir. however, this element will not be dominant within this outlook.

Whilst the degree of change will be high, there is potential to mitigate the change through planting along the watercourses feeding into the reservoir, and around the riparian margins of the waterbody. In addition, 'easing' the down-stream slope of the left embankment will also reduce the prominence of this structure, although the linearity of the reservoir edge will remain evident.

It is the opinion of the author that the occupants of this dwelling will experience a high level of potential adverse visual amenity effect.

This adverse effect has the potential to be mitigated over time to a level that is low to moderate with riparian and other native revegetation plantings where these both serve to fragment and buffer views of the reservoir and left embankment. Furthermore, the prominence of the left embankment can be reduced when viewed from this property by 'easing' the grade of the down-stream slope so that it merges more sensitively with the surrounding terrain.

The dwelling within Sec 5S Remuera SETT is elevated slightly above the dwelling within Lot 1 DP 442506 and so has the ability to gain views 'down' toward the reservoir (refer to photo 2). Views to the site are however, partially screened by existing vegetation and by the spur landforms and it is judged that, although views of the reservoir will be possible, these will be longer views to the middle and south eastern portion of the waterbody.

The degree of change will be moderate, with the primary easterly outlook from the dwelling remaining unchanged, and as with the previous affected dwelling, there is potential to mitigate the change through planting along the watercourses feeding into the reservoir, and around the riparian margins of the waterbody.

It is the opinion of the author that the occupants of this dwelling will experience a moderate level of potential adverse visual amenity effect. This adverse effect has the potential to be mitigated over time to a level that is low with riparian and other native revegetation plantings.

Occupants of dwellings located to the west and south west of the site.

Views to the proposed reservoir will not be possible from the dwelling within Lot 1 DP 378424, whilst the dwellings within Sec 50S Remuera SETT and Lot 1 DP 157098, will have the potential to gain glimpse views of the extreme north western edge of the reservoir. It is likely that they will notice the loss of an area of existing vegetation which occupies the north eastern 'arm' of the reservoir, and the presence of water within this arm. They will not be able to see the left embankment. Occupants of these latter two dwellings will experienced a low degree of change and, in the opinion of the author, a low potential adverse visual amenity effect.

A group of dwellings which occupy more elevated locations on the eastern flank of Maungakawakawa. Identified as being located within Pt Hariru B and Poukai A, Sec 58S Remuera SETT, Lot 1 DP 322598 (refer to photo 2), and Lot 1 DP 359593, these dwellings offer views to the east and north east over the Te Ruaotehauhau basin.

Separated by a minimum of some 600 – 800 metres from the edge of the proposed reservoir, occupants of these dwellings currently experience elevated, long and expansive views of the rural landscape to the east, north east and south east.

The spurs which project to the north east form a fore / midground, and frame views down into the basin. The interplay between topography, vegetation and pasture lends midground component of the outlook a high degree of amenity (refer to photos 7 and 8). The distant landscape includes views of the Maungaturoto and Pourerua cones, and in the far distance, the forested hills on the northern edge of Moerewa.

The individual dwellings offer varying degrees of exposure with respect to views over the site. The dwelling within Pt Hariru B and Poukai A (refer to photo 9) is situated at a slightly lower elevation and is partially buffered by vegetation whilst the two storey dwelling within Sec 58S Remuera SETT (visible in photo 2) offers a more complete view of the site.

The proposal will result in a noticeable modification to the midground component of the view with a high degree of change for these individuals. The foreground context to the view – being the north easterly trending spurs – will provide some separation between the reservoir and these viewers and this will serve to 'integrate' the feature into the landscape. The left embankment will be apparent as a linear element, delineated by the edge of the waterbody, but the dam within the gully will not be visible.

Occupants of Pt Hariru B and Poukai A and Lot 1 DP 322598 will, in the opinion of the author, experience a moderate to high level of potential adverse visual amenity effect. Occupants of Sec 58S Remuera SETT, Lot 1 DP 322598 and Lot 1 DP 359593 will experience a high level of potential adverse visual amenity effect.

There is the potential to mitigate these adverse effects to some degree using riparian revegetation. This will serve to both integrate the waterbody with the terrain, thereby lending it a amore natural appearance, and also fragmenting views of the waterbody. Given the elevation of these individuals, screening of the entirety of the feature will not be possible.

Two dwellings located to the south west, within Sec 16S Remuera SETT and Pt Sec 21S Remuera SETT offer elevated views across and over the site from the south western flanks of Tarahi. Occupants of the former dwelling will have the ability to observe the majority of the proposed reservoir, whilst occupants of the latter will have the potential to see its western half.

The degree of change with respect to these individuals will be high. The level of potential adverse visual amenity effect is assessed as being high for the former, and moderate to high for the latter. As with the previously described properties to the west of the site, mitigation planting will afford some degree of mitigation for these individuals, but such planting will serve to integrate the feature rather than screen it.

9.0 EFFECTS ON STATUTORY INSTRUMENTS

The key themes which arise from the relevant objectives and policies contained in the Northland Regional Policy Statement focus on the protection of, and the avoidance of adverse effects on outstanding natural features and landscapes and outstanding natural character. The Site is spatially separated from nearby features and will not adversely affect those features.

The values of the Te Ruaotehauhau Stream are described in the ecological report. The report determines the stream and its associated vegetation displays high values. The landscape values are described in section 5 of this document. Overall, the stream is determined to display a moderate level of natural character, noting that for much of its length, it flows within a modified pastoral landscape.

The proposal will result in the loss of a modification of approximately 2,114 m of continually flowing permanent stream and approximately 538m of intermittently flowing stream. The filling of the reservoir will impact the main stems and tributaries across the site, turning them from relatively natural, hard-bottom streams to lake type habitat[11].

[11] Ibid Section 4.2.4

The ecology report concludes that the potential adverse effects resulting from the proposal on freshwater ecosystems and fauna can be mitigated through implementation of management plans and residual adverse effects addressed through offset or compensation measures on similar habitats in the wider catchment.

The change in relation to the experiential and perceptual attributes of natural character will be limited in magnitude, given the separation between potential viewers and the Site. Individuals will recognise a change as a result of the loss of riparian vegetation, but within the wider landscape context, this change will be small. Overall, it is the opinion of the author that the potential adverse natural character effect of the proposal will be low, once the offset or compensation measures have been implemented.

Objectives and policies in Chapter 8 of the District Plan focus on the protection of outstanding natural features and landscape, the maintenance of rural character and amenity, and the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.

The proposal will result in the introduction of a water body into the landscape. Although the water body will be recognised as a man-made construction – due to the presence of the dam embankment and during periods of draw-down – it will be integrated into the contextual terrain and vegetative patterns. Furthermore, dams are relatively common as features of the rural environment, and are perceived as accepted features of the rural landscape.

The proposal will, therefore result in a low adverse effect on rural character.

10.0 CONCLUSION

The application seeks to construct a new water supply reservoir, by constructing a dam across the Te Ruaotehauhau Stream, and inundating a section of its headwaters, and surrounding land. The proposed reservoir will have a storage volume of 1,400,000 cubic metre (m^3) (at full supply level).

The proposal includes a landscape and visual mitigation concept which, it is proposed be developed as a condition of consent in conjunction with the project ecologist.

The assessment has determined that the potential adverse landscape effect of the proposal will be moderate locally, once the mitigation measures are completed, and low when considered in the context of the wider environment, again, once the mitigation or offset measures have been implemented.

The level of potential adverse visual effect is assessed as being high for the occupants of 5 dwellings, moderate to high for the occupants of 1 dwelling and moderate for the occupants of 2 dwellings. The balance of potentially affected individuals, including users of Hariru Road, will be affected to a low level.

A number of recommendations are included to assist with the mitigation of potential adverse landscape and visual amenity effects. These are as follows:

- Where material is excavated for use in the dam construction, that the final landform be shaped to reflect, and integrate with the adjoining unmodified landform. These areas shall be covered with topsoil and regrassed for grazing, or planted with trees, or native revegetation;
- That the downstream slope of the left hand embankment be graded such that the slope is ‘eased’ to a more gentle gradient so that it merges naturally into the adjoining terrain;
- That a landscape mitigation and management plan be required as a condition of consent. This plan should be

developed in consultation with local landowners, and in conjunction with the ecological Offset and Compensation Plan, and;

- That pedestrian access to the dam margins be investigated.

The proposal is considered to be consistent with the objectives and policies of the various statutory instruments where they are of relevance to this assessment.

Overall, the proposal can be supported from a landscape and visual perspective.

Simon Cocker

Registered Landscape Architect.

1 September 2020

Appendix 1: Figures

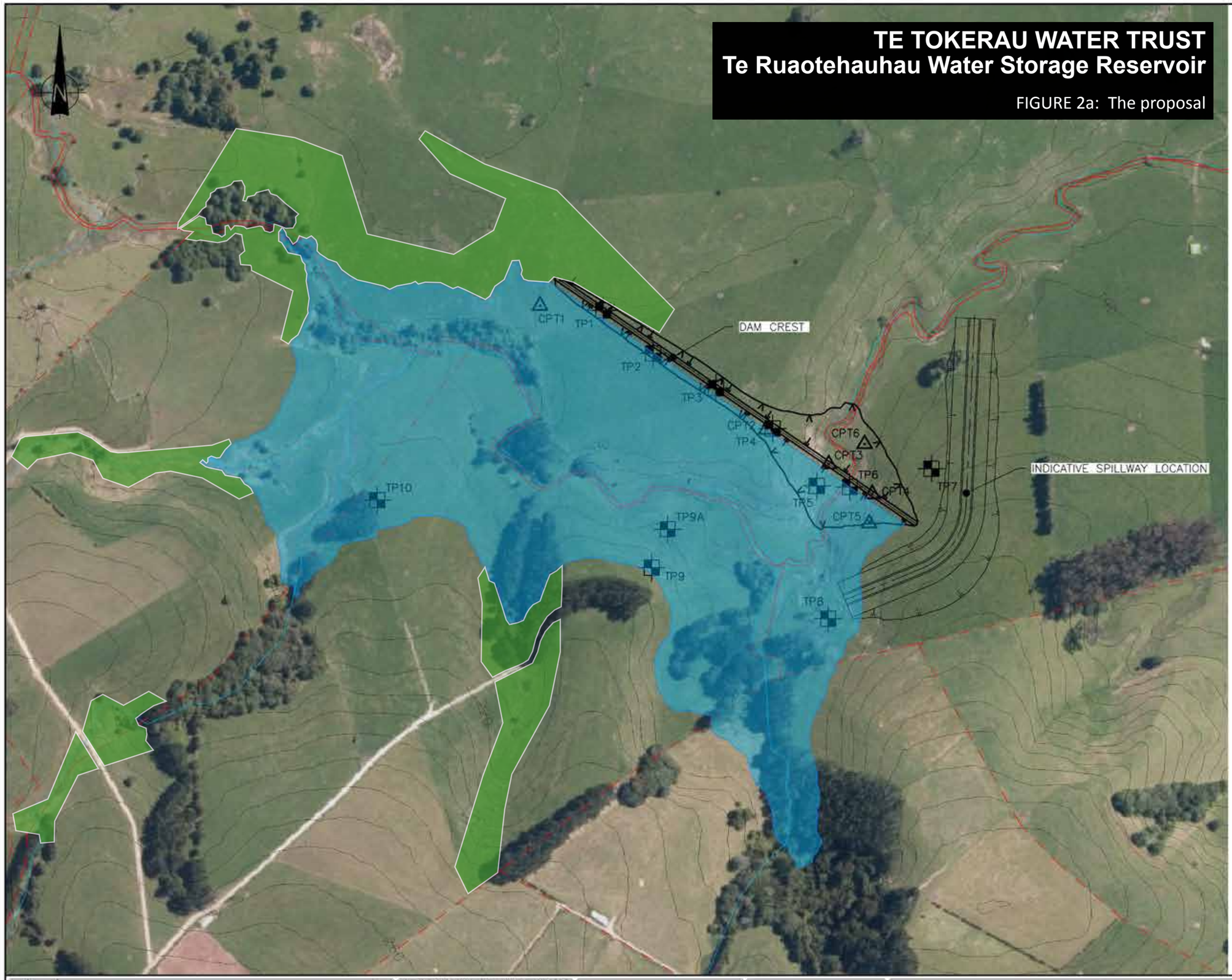
TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

FIGURE 1: The site and its landscape context

Simon Cocker Landscape Architecture

TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

FIGURE 2a: The proposal



LEGEND

- 5m CONTOURS
- PROPERTY BOUNDARY
- STREAM CHANNELS
- INUNDATION TO FULL SUPPLY LEVEL (FSL)
- TP1 TEST PIT
- CPT1 CONE PENETROMETER TEST

REFERENCE NOTES:

1. CONTOURS AND AERIAL PHOTO SOURCED FROM 2019 NORTHLAND REGIONAL COUNCIL LIDAR.
2. MAXIMUM INNUNDATION AREA ILLUSTRATES THE AREA LIKEY TO BE INNUNDATED ASSUMING A NOMINAL 20m BUFFER.

40 0 80 160m
SCALE 1:4000

DRAFT FOR INFORMATION

REV	DATE	ISSUE	BY
1		DRAFT FOR INFORMATION	MP

DESIGN	DES. CHECK	APPROVED FOR ISSUE	
EM		DRAFT	
DRAWN	CAD CHECK		
MP			
DATE DRAWN		ISSUE DATE	
AUG. 2020		05 / 08 / 20	

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WILLIAMSON WATER & LAND ADVISORY

TE TAI TOKERAU WATER TRUST

CLIENT	TE TAI TOKERAU WATER TRUST
ADDRESS	NORTHLAND
PROJECT	WATER STORAGE AND USE PROJECT
SHEET TITLE	DAM06 - SITE PLAN AND INVESTIGATIONS

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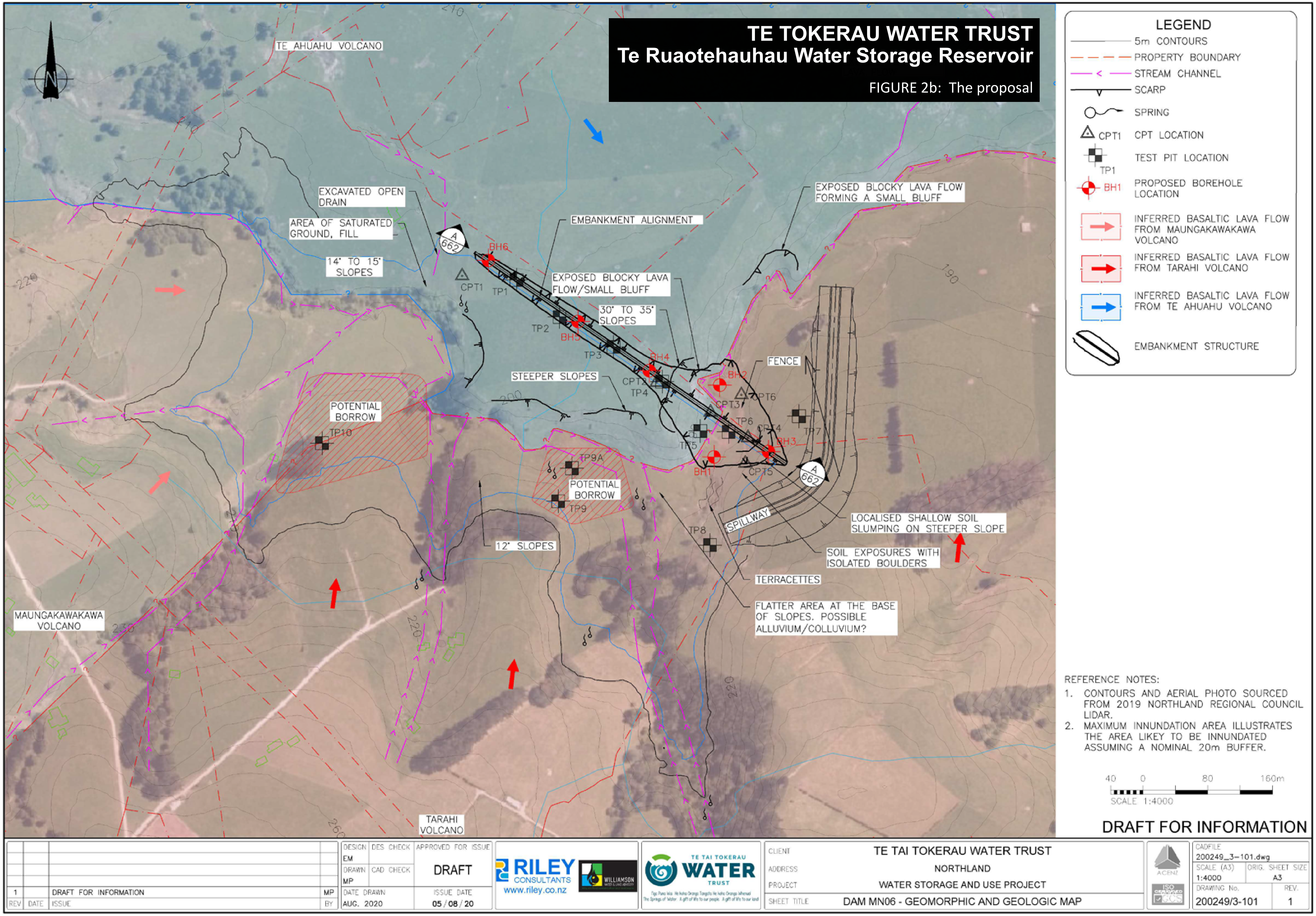
SCALE (A3)	1:4000
ORIG. SHEET SIZE	A3
DRAWING No.	200249/3-102
REV.	1


TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir
FIGURE 2b: The proposal
LEGEND
5m CONTOURS
PROPERTY BOUNDARY
STREAM CHANNEL
SCARP
SPRING
CPT1 CPT LOCATION
TP1 TEST PIT LOCATION
BH1 PROPOSED BOREHOLE LOCATION
INFERRED BASALTIC LAVA FLOW FROM MAUNGAKAWAKAWA VOLCANO
INFERRED BASALTIC LAVA FLOW FROM TARAHI VOLCANO
INFERRED BASALTIC LAVA FLOW FROM TE AHUAHU VOLCANO
EMBANKMENT STRUCTURE
TE AHUAHU VOLCANO
EXCAVATED OPEN DRAIN
AREA OF SATURATED GROUND, FILL
14° TO 15° SLOPES
EMBANKMENT ALIGNMENT
EXPOSED BLOCKY LAVA FLOW FORMING A SMALL BLUFF
EXPOSED BLOCKY LAVA FLOW/SMALL BLUFF
30° TO 35° SLOPES
STEEPER SLOPES
FENCE
POTENTIAL BORROW
POTENTIAL BORROW
12° SLOPES
SPILLWAY
LOCALISED SHALLOW SOIL SLUMPING ON STEEPER SLOPE
SOIL EXPOSURES WITH ISOLATED BOULDERS
TERRACETTES
FLATTER AREA AT THE BASE OF SLOPES. POSSIBLE ALLUVIUM/COLLUVIUM?
MAUNGAKAWAKAWA VOLCANO
TARAHI VOLCANO
BH1 BH2 BH3 BH4 BH5 BH6
CPT1 CPT2 CPT3 CPT4 CPT5 CPT6
TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP9A TP10
A 662
190
200
210
220
230
260
REFERENCE NOTES:
1. CONTOURS AND AERIAL PHOTO SOURCED FROM 2019 NORTHLAND REGIONAL COUNCIL LIDAR.
2. MAXIMUM INNUNDATION AREA ILLUSTRATES THE AREA LIKEY TO BE INNUNDATED ASSUMING A NOMINAL 20m BUFFER.
40 0 80 160m
SCALE 1:4000
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1 DRAFT FOR INFORMATION MP
REV DATE ISSUE BY
DESIGN DES CHECK APPROVED FOR ISSUE
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DRAWN CAD CHECK
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DATE DRAWN ISSUE DATE
AUG. 2020 05/08/20
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TE TAI TOKERAU WATER TRUST
CLIENT TE TAI TOKERAU WATER TRUST
ADDRESS NORTHLAND
PROJECT WATER STORAGE AND USE PROJECT
SHEET TITLE DAM MN06 - GEOMORPHIC AND GEOLOGIC MAP
CADFILE 200249_3-101.dwg
SCALE (A3) 1:4000
ORIG. SHEET SIZE A3
DRAWING No. 200249/3-101
REV. 1

TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

FIGURE 2c: The proposal

REFERENCE NOTES:
1. CONTOURS AND AERIAL PHOTO SOURCED FROM 2019 NORTHLAND REGIONAL COUNCIL LIDAR.

HAY BALES/SILT FENCE

1200ø DIVERSION PIPE

COFFER DAM

INDICATIVE SPILLWAY LOCATION

DIVERT EXISTING WATERCOURSE TO FLOW INTO DIVERSION PIPE

25 0 50 100m
SCALE 1:2500

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AUG. 2020		05 / 08 / 20

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ADDRESS	NORTHLAND
PROJECT	WATER STORAGE AND USE PROJECT
SHEET TITLE	DAM MN06 - DIVERSION AND SEDIMENT CONTROL WORKS

CAD FILE	200249_3-106.dwg
SCALE (A3)	ORIG. SHEET SIZE
1:4000	A3
DRAWING No.	REV.
200249/3-106	1

TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

FIGURE 2d: The proposal

DESIGN SURFACE LEVELS	202.00	204.00	204.00	204.00	204.00	203.93	203.79	203.73	203.66	203.52	203.38	203.24	203.15	203.10
EXISTING SURFACE LEVELS	201.81	204.83	206.41	209.58	210.69	211.37	212.41	213.05	212.89	213.18	212.29	210.73	209.05	208.50
CUT - / FILL +	0.19	-0.83	-2.41	-5.58	-6.69	-7.44	-8.61	-9.32	-9.24	-9.67	-8.91	-7.48	-5.90	-5.40
CHAINAGE	0.00	15.00	20.00	40.00	50.00	60.00	80.00	88.76	100.00	120.00	140.00	160.00	173.93	180.00

DESIGN SURFACE LEVELS	203.07	202.75	202.40	201.92	200.31	198.16	196.00	193.85	191.70	189.54	187.39	185.24	
EXISTING SURFACE LEVELS	208.07	207.12	206.74	206.27	204.13	201.62	199.85	198.44	196.10	192.88	189.02	185.39	183.74
CUT - / FILL +	-5.00	-4.37	-4.34	-4.35	-3.83	-3.47	-3.85	-4.59	-4.40	-3.33	-1.63	-0.15	
CHAINAGE	185.00	195.00	200.00	205.00	220.00	240.00	260.00	280.00	300.00	320.00	340.00	360.00	377.07

20 0 40 80m
SCALE 1:2000

SPILLWAY LONG SECTION
SCALE 1: 2000 HOR 1:1000 VERT

SPILLWAY CROSS SECTION
SCALE 1:200

2 0 4 8m
SCALE 1:200

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1		DRAFT FOR INFORMATION	MP	DESIGN: EM	DES CHECK	APPROVED FOR ISSUE: DRAFT
REV	DATE	ISSUE	BY	DRAWN: MP	CAD CHECK	
				DATE DRAWN: AUG. 2020		ISSUE DATE: 05 / 08 / 20

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TE TAI TOKERAU WATER TRUST
Ngā Puna Wai: He kōha Oranga Tangata He kōha Oranga Whenua
The Springs of Water: A gift of life to our people. A gift of life to our land

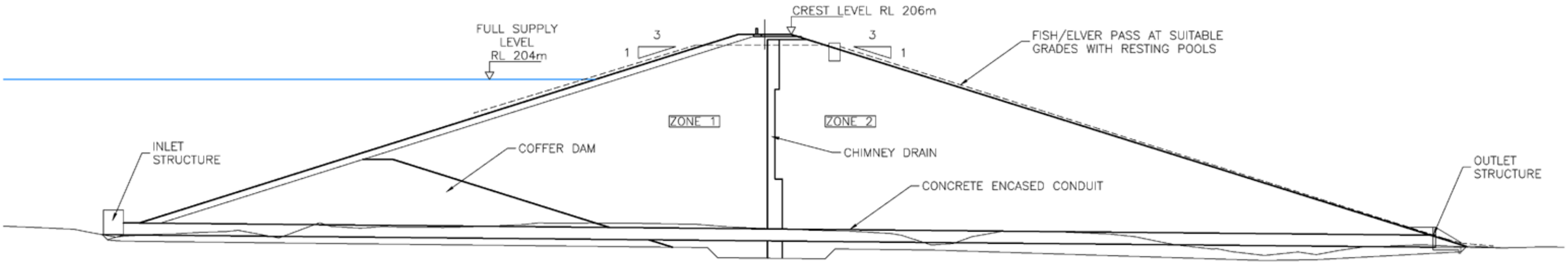
CLIENT	TE TAI TOKERAU WATER TRUST
ADDRESS	NORTHLAND
PROJECT	WATER STORAGE AND USE PROJECT
SHEET TITLE	DAM MN06 - SPILLWAY DETAILS

ACENZ

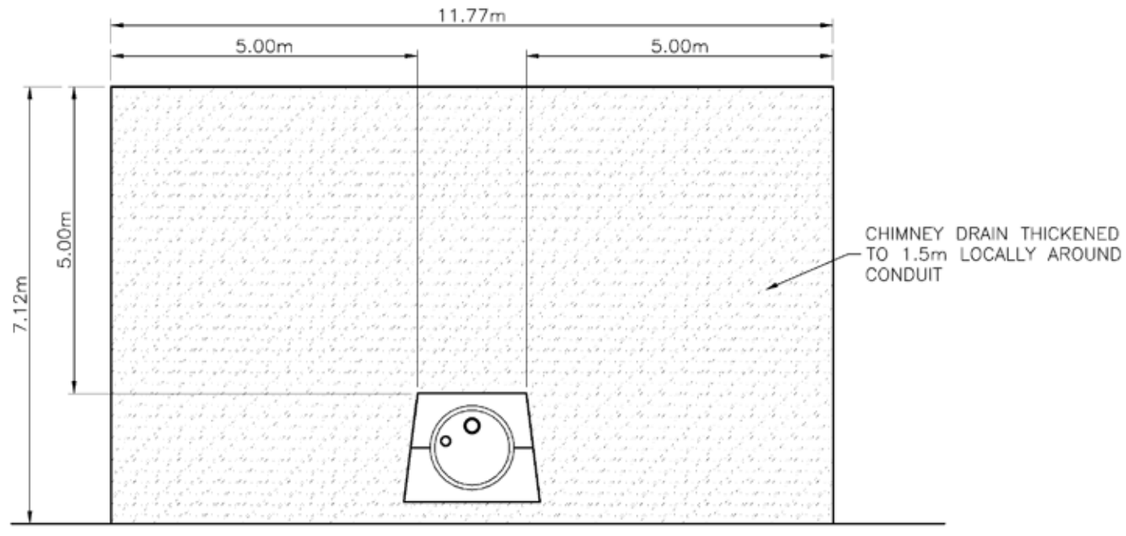
CADFILE: 200249_3-105.dwg	
SCALE (A3): AS SHOWN	ORIG. SHEET SIZE: A3
DRAWING No.: 200249/3-105	REV.: 1

TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

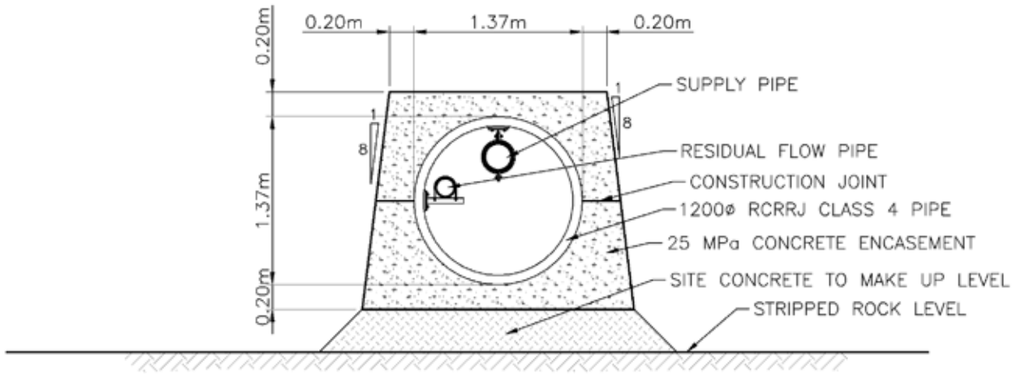
FIGURE 2e: The proposal



DAM SECTION AT CONDUIT
SCALE 1:400



DETAIL A - CHIMNEY DRAIN THICKENING AT CONDUIT
SCALE 1:100



DETAIL A - CONDUIT & ENCASEMENT DETAIL
SCALE 1:20

SCALE 1: 20
0 0.2 0.4 0.6 0.8 1.2 (m)

SCALE 1: 100
0 1 2 3 4 6 (m)

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1		DRAFT FOR INFORMATION	MD

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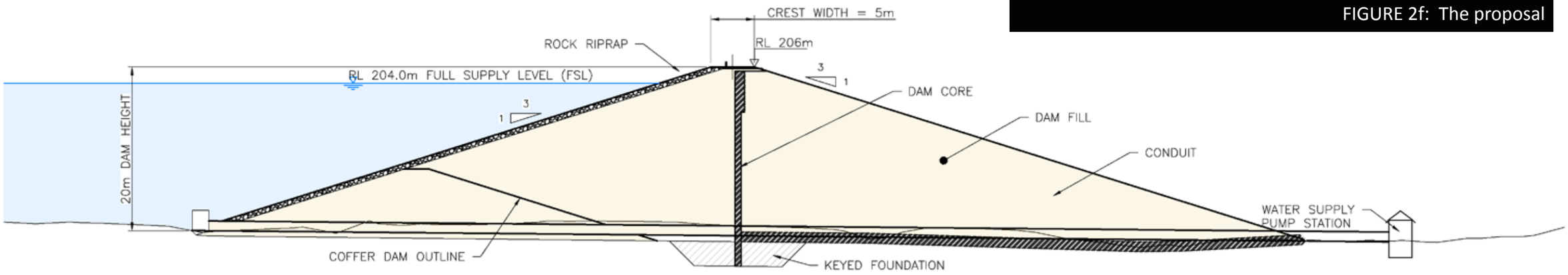
ADDRESS	NORTHLAND
PROJECT	NORTHLAND WATER STORAGE AND USE PROJECT
SHEET TITLE	DAM MN06 - CONDUIT & FISH PASS DETAILS

ACENZ
ISO CERTIFIED 9001

CADFILE	200249_3-104.dwg
SCALE (A3)	AS SHOWN
ORIG. SHEET SIZE	A3
DRAWING No.	200249/3-104
REV.	1

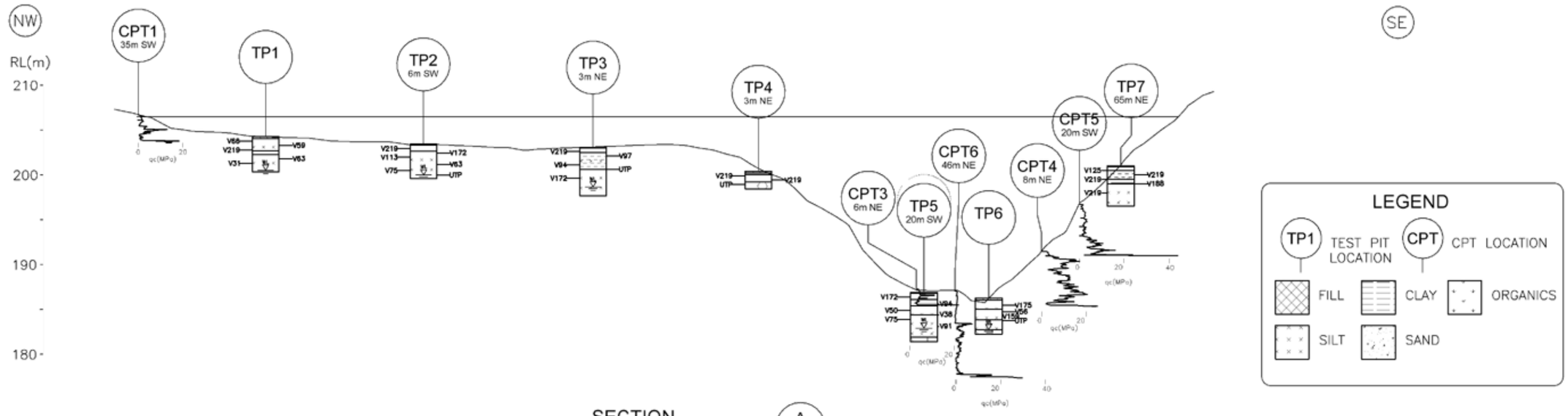
TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

FIGURE 2f: The proposal



5 0 10 20m
SCALE 1:500

TYPICAL DAM CROSS SECTION
SCALE 1: 500



LEGEND
TP1 TEST PIT LOCATION
CPT CPT LOCATION
FILL CLAY ORGANICS
SILT SAND

20 0 40 80m
SCALE 1:2000

2.5 0 5 10m
SCALE 1:250

SECTION A 102
SCALE 1:2000 HORIZONTAL
1:250 VERTICAL

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1		DRAFT FOR INFORMATION	MP

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DRAWN	CAD CHECK	
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CLIENT	TE TAI TOKERAU WATER TRUST
ADDRESS	NORTHLAND
PROJECT	WATER STORAGE AND USE PROJECT
SHEET TITLE	DAM06 - CROSS SECTION & GEOTECHNICAL SECTION A

ACENZ ISO CERTIFIED ✓ SOS

CADFILE	200249_3-103.dwg
SCALE (A3)	AS SHOWN
ORIG. SHEET SIZE	A3
DRAWING No.	200249/3-103
REV.	1

Potential riparian & offset revegetation planting

Storage area full supply level

0m 100m 200m 300m 400m

TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

FIGURE 2g: Indicative landscape mitigation concept

Simon Cocker Landscape Architecture

Photo 6
Photo 4
Lot 1 DP 442506
Sec 5S Remuera SETT
Pt Sec 4S Remuera SETT
Photo 3
Photo 1
Photo 2
Lot 1 DP 378424
Sec 50S Remuera SETT
Lot 1 DP 157098
Photo 7
Photo 9
Pt Hariru B and Poukai A
Sec 58S Remuera SETT
Photo 8
Lot 1 DP 359593
Lot 1 DP 322598

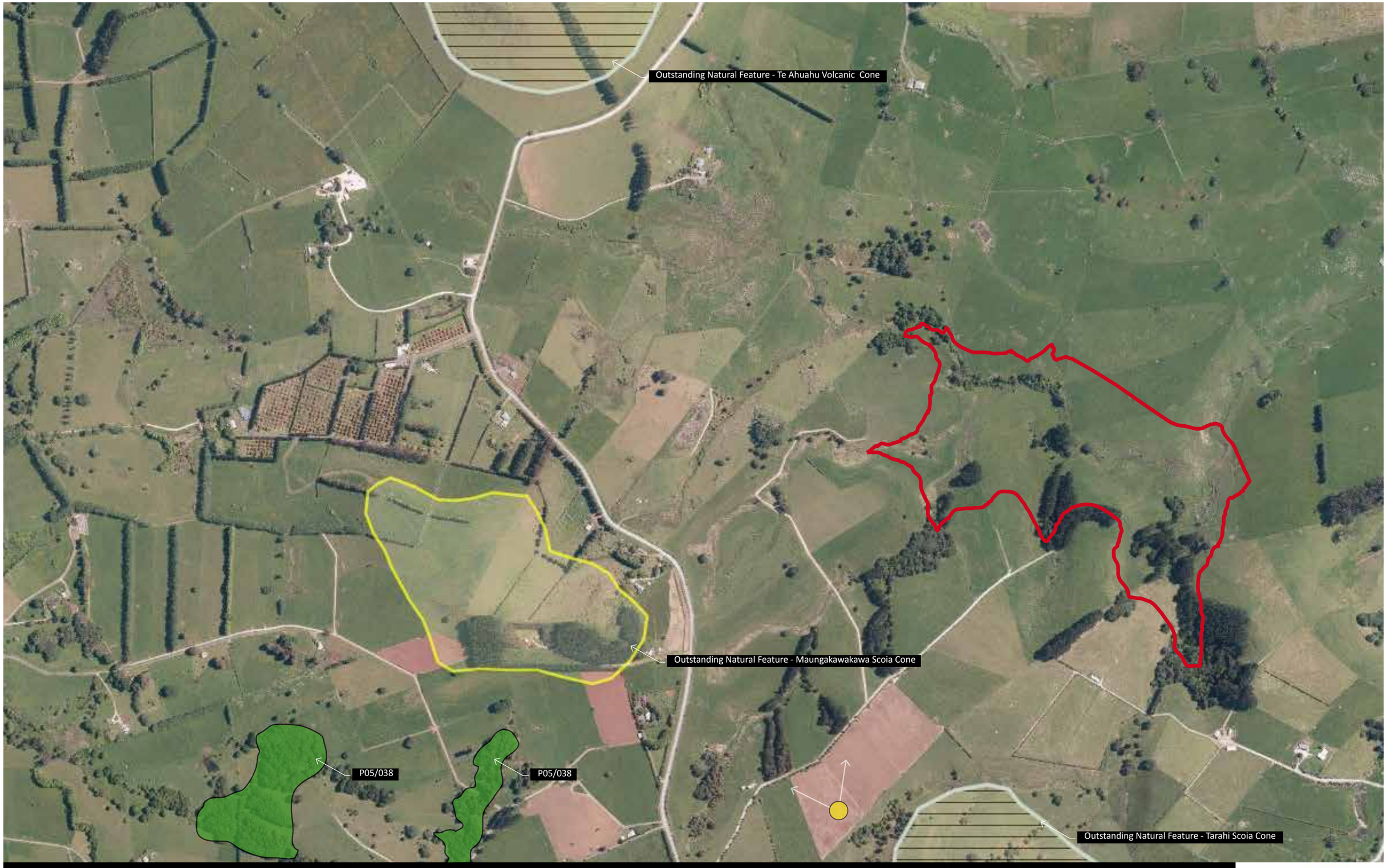
Storage area full supply level

0m 100m 200m 300m 400m

TE TOKERAU WATER TRUST
Te Ruaotehauhau Water Storage Reservoir

FIGURE 3: Immediate context of the site, and potentially affected properties

Simon Cocker Landscape Architecture



TE TOKERAU WATER TRUST
Aratapu Water Storage Reservoir

FIGURE 4: Identified values

Simon Cocker Landscape Architecture

Photo 1: View south west alomng gully toward location of proposed dam embankment

Photo date: 10 June 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 2: View north west to Maungakawakawa and Hariru Road

Photo date: 13 July 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 3: View to north west toward Te Ahuahu and Hariru Road

Photo date: 16 July 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 4: View south east from Hariru Road

Photo date: 16 July 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 5: View south from entrance to Lot 1 DP 442506, Hariru Road

Photo date: 27 July 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 6: View south east from Hariru Road

Photo date: 16 July 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 7: View north east from Hariru Road

Photo date: 16 July 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 8: View north east from Hariru Road

Photo date: 16 July 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Photo 9: View east from Pt Hariru B and Poukai A

Photo date: 27 August 2020.

Te Ruaotehauhau Water Storage Reservoir

Photographs

Photos taken with digital equivalent of 50mm focal length unless otherwise specified.
Photos represent a 124° horizontal and 55° vertical field of view, and should be read at a distant of 400mm

Simon Cocker
Landscape Architecture

Appendix 2: Landscape and visual effects assessment methodology

Landscape and Visual Effects Assessment Methodology

Introduction

The landscape and visual effects assessment process provides a framework for assessing and identifying the nature and level of likely effects that may result from a proposed development. Such effects can occur in relation to changes to physical elements, the existing character of the landscape and the experience of it. In addition, the landscape assessment method may include an iterative design development processes which includes stakeholder involvement. The outcome of any assessment approach should seek to avoid, remedy or mitigate adverse effects. A separate assessment is required to assess changes in natural character in coastal areas and other waterbodies.

When undertaking landscape and visual effects assessments, it is important that a structured and consistent approach is used to ensure that findings are clear and objective. Judgement should always be based on skills and experience, and be supported by explicit evidence and reasoned argument.

While landscape and visual effects assessments are closely related, they form separate procedures. The assessment of the potential effect on the landscape forms the first step in this process and is carried out as an effect on an environmental resource (i.e. landscape elements, features and character). The assessment of visual effects considers how changes to the physical landscape affect the viewing audience. The types of effects can be summarised as follows:

> **Landscape effects:**
> *Change in the physical landscape, which may change its characteristics or qualities.*
>
> **Visual effects:**
> *Change to views which may change the visual amenity experienced by people.*

The policy context, existing landscape resource and locations from which a development or change is visible all inform the 'baseline' for landscape and visual effects assessments. To assess effects, the landscape must first be described, including an understanding of the key landscape characteristics and qualities. This process, known as landscape characterisation, is the basic tool for understanding landscape character and may involve subdividing the landscape into character areas or types. The condition of the landscape (i.e. the state of an individual area of landscape or landscape feature) should also be described alongside a judgement made on the value or importance of the potentially affected landscape.

This outline of the landscape and visual effects assessment methodology has been undertaken with reference to the Quality Planning Landscape Guidance Note1[1] and its signposts to examples of best practice which include the UK guidelines for landscape and visual impact assessment[2] and the New Zealand Landscape Institute Guidelines for Landscape Assessment[3].

Assessing landscape effects requires an understanding of the nature of the landscape resource and the magnitude of change which results from a proposed development to determine the overall level of landscape effects.

Nature of the landscape resource

Assessing the nature of the landscape resource considers both the susceptibility of an area of landscape to change and the value of the landscape. This will vary upon the following factors:

- Physical elements such as topography / hydrology / soils / vegetation;
- Existing land use;
- The pattern and scale of the landscape;

[1] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape
[2] Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)
[3] Best Practice Note Landscape Assessment and Sustainable Management 10.1, NZILA

- Visual enclosure / openness of views and distribution of the viewing audience;
- The zoning of the land and its associated anticipated level of development;
- The value or importance placed on the landscape, particularly those confirmed in statutory
- documents; and
- The scope for mitigation, appropriate to the existing landscape.

The susceptibility to change takes account of both the attributes of the receiving environment and the characteristics of the proposed development. It considers the ability of a specific type of change occurring without generating adverse effects and/or achievement of landscape planning policies and strategies.

Landscape value derives from the importance that people and communities, including tangata whenua, attach to particular landscapes and landscape attributes. This may include the classification of

Outstanding Natural Landscape (RMA s.6(b)) based on important biophysical, sensory/ aesthetic and associative landscape attributes, which have potential to be affected by a proposed development.

Magnitude of Landscape Change

The magnitude of landscape change judges the amount of change that is likely to occur to existing areas of landscape, landscape features, or key landscape attributes. In undertaking this assessment, it is important that the size or scale of the change is considered within the geographical extent of the area influenced and the duration of change, including whether the change is reversible. In some situations, the loss /change or enhancement to existing landscape elements such as vegetation or earthworks should also be quantified.

When assessing the level of landscape effects, it is important to be clear about what factors have been considered when making professional judgements. This can include consideration of any benefits which result from a proposed development. Table 1 below helps to explain this process. The tabulating of effects is only intended to inform overall judgements.

Contributing factors		Higher	Lower
Nature of Landscape Resource	**Susceptibility to change**	The landscape context has limited existing landscape detractors which make it highly vulnerable to the type of change which would result from the proposed development.	The landscape context has many detractors and can easily accommodate the proposed development without undue consequences to landscape character.
	The value of the landscape	The landscape includes important biophysical, sensory and associative attributes. The landscape requires protection as a matter of national importance (ONF/L).	The landscape lacks any important biophysical, sensory or associative attributes. The landscape is of low or local importance.
Magnitude of Change	**Size or scale**	Total loss or addition of key features or elements. Major changes in the key characteristics of the landscape, including significant aesthetic or perceptual elements.	The majority of key features or elements are retained. Key characteristics of the landscape remain intact with limited aesthetic or perceptual change apparent.
	Geographical extent	Wider landscape scale.	Site scale, immediate setting.
	Duration and reversibility	Permanent. Long term (over 10 years).	Reversible. Short Term (0-5 years).

Table 1: Determining the level of landscape effects

Visual Effects

To assess the visual effects of a proposed development on a landscape, a visual baseline must first be defined. The visual 'baseline' forms a technical exercise which identifies the area where the development may be visible, the potential viewing audience, and the key representative public viewpoints from which visual effects are assessed.

The viewing audience comprises the individuals or groups of people occupying or using the properties, roads, footpaths and public open spaces that lie within the visual envelope or 'zone of visual influence' of the site and proposal. Where possible, computer modelling can assist to determine the theoretical extent of visibility together with field work undertaken to confirm this. Where appropriate, key representative viewpoints should be agreed with the relevant local authority.

Nature of the viewing audience

The nature of the viewing audience is assessed in terms of the susceptibility of the viewing audience to change and the value attached to views. The susceptibility of the viewing audience is determined by assessing the occupation or activity of people experiencing the view at particular locations and the extent to which their interest or activity may be focused on views of the surrounding landscape. This relies on a landscape architect's judgement in respect of visual amenity and reaction of people who may be affected by a proposal. This should also recognise that people more susceptible to change generally include: residents at home, people engaged in outdoor recreation whose attention or interest is likely to be focused on the landscape and on particular views; visitors to heritage assets or other important visitor attractions; and communities where views contribute to the landscape setting.

The value or importance attached to particular views may be determined with respect to its popularity or numbers of people affected or reference to planning instruments such as viewshafts or view corridors.

Important viewpoints are also likely to appear in guide books or tourist maps and may include facilities provided for its enjoyment. There may also be references to this in literature or art, which also acknowledge a level of recognition and importance.

Magnitude of Visual Change

The assessment of visual effects also considers the potential magnitude of change which will result from views of a proposed development. This takes account of the size or scale of the effect, the geographical extent of views and the duration of visual change which may distinguish between temporary (often associated with construction) and permanent effects where relevant. Preparation of any simulations of visual change to assist this process should be guided by best practice as identified by the NZILA[4].

When determining the overall level of visual effect, the nature of the viewing audience is considered together with the magnitude of change resulting from the proposed development. Table 2 has been prepared to help guide this process:

Contributing factors		Higher	Lower
Nature of Landscape Resource	**Susceptibility to change**	Views from dwellings and recreation areas where attention is typically focussed on the landscape..	Views from places of employment and other places where the focus is typically incidental to its landscape context. Views from transport corridors.
	The value of the landscape	Viewpoint is recognised by the community such as an important view shaft, identification on tourist maps or in art and literature. High visitor numbers.	Viewpoint is not typically recognised or valued by the community. Infrequent visitor numbers..
Magnitude of Change	**Size or scale**	Loss or addition of key features in the view. High degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture). Full view of the proposed development	Most key features of view retained. Low degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture. Glimpse / no view of the proposed development.
	Geographical extent	Front on views. Near distance views; Change visible across a wide area.	Oblique views. Long distance views. Small portion of change visible.
	Duration and reversibility	Permanent. Long term (over 15 years).	Transient / temporary. Short Term (0-5 years).

[4] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

Nature of Effects

In combination with assessing the level of effects, the landscape and visual effects assessment also considers the nature of effects in terms of whether this will be positive (beneficial) or negative (adverse) in the context within which it occurs. Neutral effects can also occur where landscape or visual change is benign.

It should also be noted that a change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways, these changes are both natural and human induced. What is important in managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use. The aim is to provide a high amenity environment through appropriate design outcomes.

This assessment of the nature effects can be further guided by Table 3 set out below:

Nature of effect	Use and definition
Adverse (negative):	The proposed development would be out of scale with the landscape or at odds with the local pattern and landform which results in a reduction in landscape and / or visual amenity values
Neutral (benign):	The proposed development would complement (or blend in with) the scale, landform and pattern of the landscape maintaining existing landscape and / or visual amenity values
Beneficial (positive):	The proposed development would enhance the landscape and / or visual amenity through removal of restoration of existing degraded landscapes uses and / or addition of positive elements or features

Table 3: Determining the Nature of Effects

Cumulative Effects

During the scoping of an assessment, where appropriate, agreement should be reached with the relevant local authority as to the nature of cumulative effects to be assessed. This can include effects of the same type of development (e.g. wind farms) or the combined effect of all past, present and approved future development[5] of varying types, taking account of both the permitted baseline and receiving environment. Cumulative effects can also be positive, negative or benign.

Cumulative Landscape Effects

Cumulative landscape effects can include additional or combined changes in components of the landscape and changes in the overall landscape character. The extent within which cumulative landscape effects are assessed can cover the entire landscape character area within which the proposal is located, or alternatively, the zone of visual influence from which the proposal can be observed.

Cumulative Visual Effects

Cumulative visual effects can occur in combination (seen together in the same view), in succession (where the observer needs to turn their head) or sequentially (with a time lapse between instances where proposals are visible when moving through a landscape). Further visualisations may be required to indicate the change in view compared with the appearance of the project on its own.

Determining the nature and level of cumulative landscape and visual effects should adopt the same approach as the project assessment in describing both the nature of the viewing audience and magnitude of change leading to a final judgement. Mitigation may require broader consideration which may extend beyond the geographical extent of the project being assessed.

Determining the Overall Level of Effects

[5] The life of the statutory planning document or unimplemented resource consents

The landscape and visual effects assessment concludes with an overall assessment of the likely level of landscape and visual effects. This step also takes account of the nature of effects and the effectiveness of any proposed mitigation.

This step informs an overall judgement identifying what level of effects are likely to be generated as indicated in Table 4 below. This table which can be used to guide the level of landscape and visual effects uses an adapted seven-point scale derived from NZILA's Best Practice Note.

	Effect rating	Use and definition
More than minor . . . . **Minor** . . . . . . **Less than minor**	**Very high**	Total loss of key elements / features / characteristics, i.e. amounts to a complete change of landscape character
	High	Major modification or loss of most key elements / features / characteristics, i.e. little of the pre-development landscape character remains. Concise Oxford English Dictionary Definition High: adjective- Great in amount, value, size, or intensity
	Moderate to high	Modifications of several key elements / features / characteristics of the baseline, i.e. the pre-development landscape character remains evident but materially changed.
	Moderate	Partial loss of or modification to key elements / features / characteristics of the baseline, i.e. new elements may be prominent but not necessarily uncharacteristic within the receiving landscape. Concise Oxford English Dictionary Definition Moderate: adjective- average in amount, intensity, quality or degree
	Moderate to low	Minor loss of or modification to one or more key elements / features / characteristics, i.e. new elements are not prominent or uncharacteristic within the receiving landscape.
	Low	No material loss of or modification to key elements / features / characteristics. i.e. modification or change is not uncharacteristic and absorbed within the receiving landscape. Concise Oxford English Dictionary Definition Low: adjective- 1. Below average in amount, extent, or intensity
	Very low	Little or no loss of or modification to key elements/ features/ characteristics of the baseline, i.e. approximating a 'no change' situation.

Table 4: Determining the overall level of landscape and visual effects

Determination of "minor"

Decision makers determining whether a resource consent application should be notified must also assess whether the effect on a person is less than minor6[6] or an adverse effect on the environment is no more than minor[7]. Likewise, when assessing a non-complying activity, consent can only be granted if the s104D 'gateway test' is satisfied. This test requires the decision maker to be assured that the adverse effects of the activity on the environment will be 'minor' or not be contrary to the objectives and policies of the relevant planning documents.

These assessments will generally involve a broader consideration of the effects of the activity, beyond the landscape and visual effects. Through this broader consideration, guidance may be sought on whether the likely effects on the landscape resource or effects on a person are considered in relation to 'minor'. It must also be stressed that more than minor effects on individual elements or viewpoints does not necessarily equate to more than minor effects on the wider landscape resource. In relation to this assessment, moderate-low level effects would generally equate to 'minor'.

[6] RMA, Section 95E
[7] RMA Section 95D