

## **Appendix B: New Zealand Battery Project Landscape and Visual Assessment**

# NEW ZEALAND BATTERY PROJECT

## Landscape and Visual Assessment

Prepared for Department of Conservation

August 2021





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# NZ BATTERY PROJECT

## LAKE ONSLOW AND SURROUNDING AREA

### LANDSCAPE AND VISUAL ASSESSMENT

#### 1 EXECUTIVE SUMMARY

1. The area affected by the NZ Battery Project includes from the Teviot Valley east across the Teviot Downlands centred on the Teviot River corridor and up into the Onslow Basin with wider effects over an extended area of the upland plateau.
2. The three distinct areas that form the landscape units for this assessment are a continuum in terms of naturalness with the Teviot Valley being the most modified, the intermediate Downlands (gradually being transformed from a natural landscape to a predominately agricultural landscape), and the Onslow Basin and wider Upland Plateau a predominately natural landscape.
4. The Onslow Basin (and the whole of the upland plateau) is not a pristine natural landscape and has obvious cultural intrusions and features, but natural characteristics predominate.
5. Reservoirs are an accepted part of the East Otago upland landscape. The options for the NZ Battery Project would result in a waterbody much larger than any of the existing reservoirs.
6. The Onslow Basin is on the western edge of the East Otago upland landscape and is probably the most modified basin of the whole upland area (certainly more modified than the Lammerlaw and Lammermoor Ranges and areas further east).
7. All the level options for a proposed reservoir are physically contained within the natural boundaries of the Onslow Basin. This contains the disturbance and some of the landscape and visual effects of raising the lake level to the Onslow Basin and areas west of the Onslow Basin where supporting infrastructure would be located.
8. All the possible proposed lake levels (between 740-800m asl) are likely to have similar landscape and visual effects. The main effect is the massively increased lake from the current level in comparison to any one of the proposed options.
9. The raised lake (all options) would be visible from a large number of viewpoints and certainly many of the high points over a wide area of the upland plateau, but this would not necessarily result in a major impact for landscape and visual values. The location of the Onslow Basin on the western edge of the upland plateau and the scale of the upland area will assist with absorbing the size and scale of the raised lake.
10. There will be significant loss of tussock and other indigenous vegetation within the Onslow Basin. The loss of the extensive and special wetlands and features within the Onslow Basin will be the greatest impact for landscape and visual values of raising the lake.

11. The effects of the dam wall and other large-scale infrastructure (known at this time) can be accommodated within the Teviot Beaumont Downlands and the Clutha/Mata-Au/Teviot Valley landscape units.
12. Generating plant and infrastructure located at the dam wall would have major landscape and visual effects and would be preferable if co-located alongside or near existing Roxburgh hydro infrastructure.
13. Disposal of excavated material from machine room and tunnel excavation will be a major landscape and visual issue.

## 2 INTRODUCTION & BACKGROUND

The purpose of this landscape assessment is to assess the landscape and visual values of Lake Onslow and surrounding areas which will contribute to a study to look at options to meet New Zealand's dry year electricity problem and in particular the investigation into a possible pumped hydro scheme at Lake Onslow in Central Otago. The Ministry of Business Innovation and Employment (MBIE) are considering a number of different options, from raising the Lake level from its current level (approx. 700m above sea level) to between 770 and 800m above sea level.

The report assesses the landscape and visual values of the Lake Onslow landscape and surrounding environs and the likely effects of the NZ Battery Project.

The area likely to be affected by the project that includes a significantly enlarged reservoir and the likely associated infrastructure and disturbance from construction covers the Roxburgh/Teviot Valley in the west, east across the Downslands flanking the eastern side of the Teviot Valley to the expansive upland area (latter referred as the East Otago Uplands or upland plateau). While all these areas are part of the assessment the focus is the Lake Onslow area and environs.

The report is structured as follows:

- Introduction
- Methodology
- Location and Landscape Context
- Statutory Provisions
- Existing landscape and Values
- Proposal for NZ Battery Project
- Landscape Effects/Issues
- Conclusion

## 3 METHODOLOGY

The definition of landscape used for this assessment is as follows:

*The Landscape embodies the relationship between people and place. It includes the physical character of an area, how the area is experienced and perceived, and the meanings associated with it.*<sup>1</sup>

The methodology for this assessment includes the following:

1. A description of the location and wider regional context.
2. Landscape character units or areas are defined and the characteristics of each unit or area are described. This includes the physical (natural and human), associative and perceptions of each landscape. The criteria used is as follows:
  - (a) A description of character
    - Natural science factors (geological, topographical, ecological and dynamic components).

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<sup>1</sup> Aotearoa Landscape Assessment Guidelines Final Draft April 2021

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- Historical aspects and cultural elements and features.
- Other characteristics e.g., remoteness, isolation, wildness.

(b) A description of Values:

- Naturalness.
- Legibility.
- Tangata Whenua values.
- Aesthetic values including.

-Distinctiveness. The quality that makes a particular landscape visually striking and impressive;

-Coherence. Assessed by characteristics and terms such as intactness, unity, compositional harmony between elements, continuity and compatibility. Intrusions and alterations detract from Coherence;

-Diversity. The diversity of the features and characteristics of the landscape;

- Transient Values.
- People and communities shared and recognised values.
- Memorability.

(c) Perceptions of the landscape - a selection of perceptions - direct or indirect if applicable.

3. A description of the visual and scenic values. This refers to inherent visual values, and secondly by visibility from public places such as roads, lakes, waterways or public land.

4. An assessment of landscape vulnerability.

5. A summary evaluation of Individual units

Note: Cultural values including Tangata Whenua values are an important component of landscape values. A cultural values assessment for the NZ Battery Project is yet to be commissioned and information therefore from this has not able to be incorporated into this report.

## 4 LOCATION AND LANDSCAPE CONTEXT

Lake Onslow is located approximately 25km east of Roxburgh. It is a man-made lake in a natural depression and created by the damming of the Teviot River for hydro development and irrigation formed in the 1950's.

It sits at approximately 700m above sea level.

It is within the distinctive rolling uplands and expansive, predominantly tussock hinterland that separates Coastal Otago from the inland basins and block mountain ranges of Central Otago. The upland plateau or area extends from the Knobby Range in the northwest across the Greenland/Manorburn plateau to include South Rough Ridge, Lake Onslow Basin, the Lammerlaw and Lammermoor Ranges (collectively referred to as Lammerlaws and Lammermoors). The Lammermoors extend approximately 30km from the Lammerlaw Range top and includes the Te Papanui Conservation Park before reaching the Sutton Salt Lake. This separates it from the southern end of the Rock and Pillar Range. The upland area is bounded by the intermontane valleys and basins of Strath Taieri (east), the Maniototo Plain (including Paerau/Styx Basin), Ida Valley, Manuherikia Valley, Alexandra/Clyde Basin (north and northwest), and the Clutha/Mata-Au River on the western flank.

It is part of a large, distinctly Central Otago natural area almost entirely unpopulated by humans.

The higher upland areas of the Old Man, Umbrella and Garvie Ranges lie west of the Teviot Valley with West Otago, the Blue Mountains and Waikaia extending to the south and southwest.

The Onslow Basin and environs are within the Manorburn Ecological District with the wider East Otago Uplands within the Waipori /Lammerlaw Ecological District.

The Otago Conservation Management Strategy (CMS), 2016 includes the upland area as 'Central Otago Upland Place' and describes it as 'rolling intermontane tussock grassland.'<sup>2</sup>

The elevation of the study area ranges from approximately 150m on the Teviot Flats to approximately 700m at Lake Onslow, to 1210m asl at Lammerlaw Top located on the main Lammerlaw Range, 1132m asl at Ailsa Craig on the Lammermoor Range rising to 1450m at Summit Rock on the Rock and Pillar Range. The upland plateau is generally above 750m asl.

The landform is characterised by wide basins such as Lake Onslow with broad ridges separating the catchments. The streams draining into Lake Onslow have significant meandering sections with oxbow lakes. These are characterised by island-like centres where they have been cut off by the river.

The basement rock of the entire upland area is Otago schist which has been subject to folding and uplift and forming the relatively flat summits typical of the Otago peneplain typical of Central Otago. Onslow Basin is within the ancient low relief peneplain referred to as the Waipounamu erosion surface or broken peneplain<sup>3</sup>. Stream beds between ridges are fluvial deposits. Where the headwaters of the Teviot and Taieri Rivers leave

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<sup>2</sup> Otago CMS 2016

<sup>3</sup> Department of Geology, Otago University

*NZ Battery Project: Landscape & Visual Assessment (FINAL) Blakely Wallace Associates, August 2021*



the upland plateau, they have cut down to the plains below often forming steep incised gorges with extensive rock outcrops and exposure.

The upland area is an important watershed and source of many tributaries of the Taieri and lower Clutha/Mata-Au Rivers. The origins of the place names Lammermoor and Lammerlaw Ranges is Scottish<sup>4</sup> due to the likeness to the moors in Scotland and frequently shrouded by cloud and fog<sup>5</sup>. The climate in the vicinity of Lake Onslow is relatively hot summers and cold winters though the Lammerlaws and Lammermoor's are subject to a greater maritime influence than other Central Otago Ranges. Rainfall on the Clutha/Mata-Au flats is in the vicinity of 600mm. Areas on the upland plateau receive in excess of 1000mm/year (Otago Regional Council 1999). Air temperatures are frequently low especially at higher altitude.<sup>6</sup> Snowfalls and snow accumulation are frequent and variable from year to year and can lie for long periods in winter especially on higher ground such as the Lammerlaws Tops.

Land within the Onslow Basin and surrounding environs is either pastoral lease or privately owned. **Beaumont Station boundaries Lake Onslow to the south and southeast.** The closest Conservation Land is the Manorburn Conservation area to the northwest which is partly within the Onslow Basin. The Serpentine Conservation Area is northeast of the Greenland Reservoir and the large Te Papanui Conservation Park located southwest.

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<sup>4</sup> Wikipedia

<sup>5</sup> Beaumont CRR

<sup>6</sup> Beaumont CRP p20







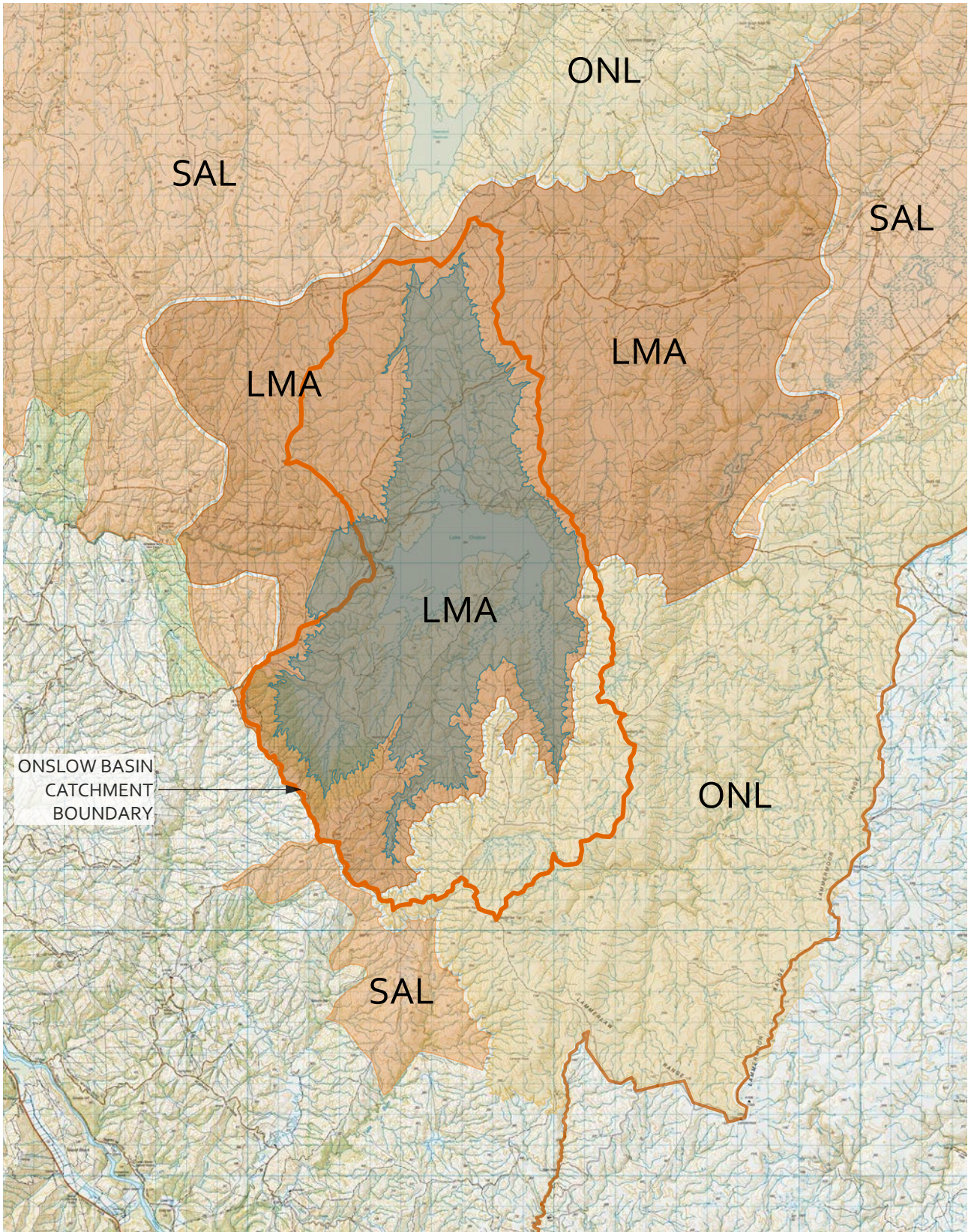
## 5 STATUTORY PROVISIONS

Lake Onslow and the surrounding landscape is within the Central Otago District (CODC) with part of the Lammerlaws (within the assessment area) within the Dunedin City Council (DCC). The CODC underlying zoning is Rural Resource Area (RU). Lake Onslow Basin is included within a Landscape Management Area (LMA) designation.

An Outstanding Natural Landscape (ONL) overlay covers the Greenland and Upper Manorburn, parts of South Rough Ridge, the Rock and Pillar Range, and the Lammermoor and Lammerlaw Ranges. The area of the Lammermoors within the DCC is also ONL. The CODC also has a Significant Amenity Landscape (SAL) designation which applies over other parts of the upland plateau.

The ONL areas are protected under Sections 6 & 7 of Part 2 of the Resource Management Act (RMA). The ONLs and the LMA's are subject to relevant objectives and policies in the CODC plans (refer Appendix 1)











6

**CODC Designations**  
Scale: 1:150000

Legend

- |  |  |
|--|--|
|  Onslow Basin Catchment             |  ONL (CODC) |
|  CODC Boundary                      |  SAL (CODC) |
|  Area of Proposed Inundation (800m) |  LMA (CODC) |



## 6 EXISTING LANDSCAPE AND VALUES

As outlined above the assessment area (determined by areas likely to be affected by the NZ Battery Project) extends from the Roxburgh/Teviot Valley in the west, east across the Downslands flanking the eastern side of the Teviot Valley to the expansive upland area that separates the Clutha Mata/Au and the Taieri River. These 3 readily identifiable entities are the landscape units forming the basis for the landscape assessment.

The landscape units broadly reflect areas of similar landscape character.

The three **landscape units** or landscape character areas defined for the Lake Onslow and surrounding areas landscape assessment include:

**LU1: Clutha/Mata-Au/Teviot Valley**

**LU2: Teviot/Beaumont Downslands**

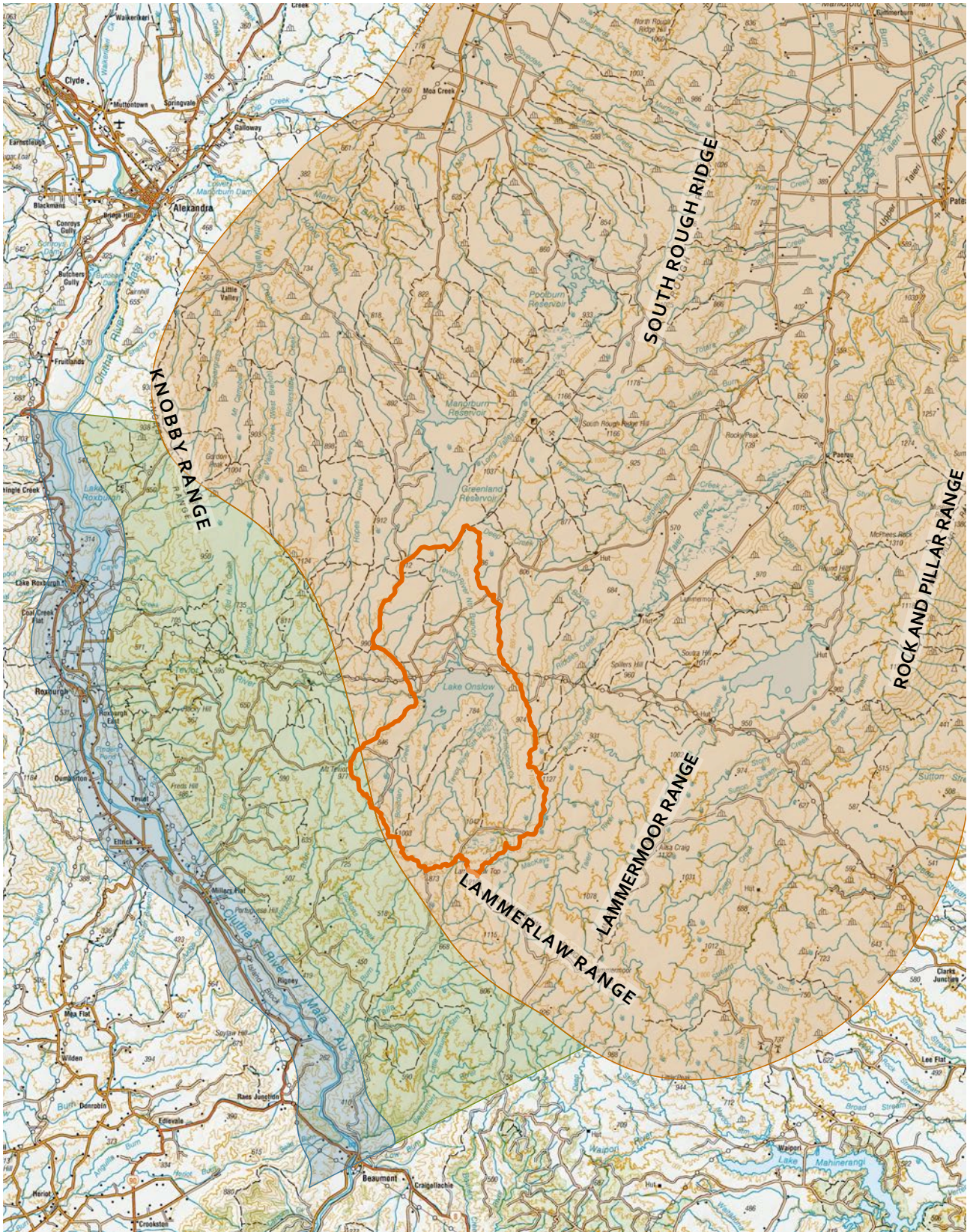
**LU3: East Otago Uplands**

The East Otago Uplands landscape unit has further been divided into areas or sub types that comprise the expansive upland area. These include:

- Onslow Basin
- Greenland/Manorburn Basin/Plateau
- South Rough Ridge
- Lammerlaws/Lammermoors

The East Otago Uplands is the core area containing the Onslow Basin and will be the focus for this assessment. However, the Clutha/Mata-Au/Teviot Valley and Teviot/Beaumont Downslands landscape units will have infrastructure to support the project and therefore likely to be affected by the NZ Battery Proposal and assessment of these areas is also undertaken.





7

**Landscape Units**  
Scale: 1:300000

- Legend
- Onslow Basin Catchment
  - Clutha/Mata-Au/Teviot Valley
  - Teviot/Beaumont Downs
  - Central Uplands (Clutha/Tairāhiki Headwaters)



## 6.1 LANDSCAPE UNIT 1 (LU1) CLUTHA/MATA-AU/TEVIOT VALLEY

### 6.1.1 CHARACTER

For the purposes of this assessment LU1 covers the area of Lake Roxburgh Gorge above the Roxburgh Dam and including the topographically defined Teviot Valley downstream to approximately Beaumont. The assessment for this unit is focused on the section of the Teviot Valley between the Roxburgh Gorge upstream of the Dam and Millars Flat.

Upstream of the dam wall Lake Roxburgh is tightly contained within a flooded valley within an arid, deeply incised, rocky schist gorge.

The equally arid and rocky Knobby Range rises to the northeast of the gorge with Gordon Peak (1004m) and Pinelheugh (1124m) prominent on the skyline to the east.

Below the dam the valley opens out to the mainly alluvial flats of the Teviot Valley with the Clutha/Mata-Au River the central focus. The much higher Old Man Range/Kopuwai and Mt Bengier form the steep enclosing mountain slopes on the western side with the lower Teviot hills and downlands enclosing the east side of the Teviot Valley. The lower hillslopes on both sides of the valley are mainly used for pastoral farming.

Teviot River and other side tributaries are cut down into the hillslope with extensive rock outcrops and exposure. The Teviot Valley is dominated by intensive horticulture, orchards, farmland and dwellings, structures and irrigation ponds and infrastructure associated with those activities. The Roxburgh airstrip and racecourse also occupy the flat topography of the valley floor.

The Roxburgh hydro dam and associated industrial infrastructure constructed in the 1950's is large in scale, and both are dominant features at the northern end of the Teviot Valley. There are scars and localised modifications to natural character from the dam construction. Vegetation along the river margins is dominated by willow and poplar with small settlements along the way. Roxburgh is the largest built-up area.

SH 8 follows the Teviot Valley often close to the river. Apart from the road crossing the Roxburgh Dam there are bridges at Roxburgh and Millars Flat. From Roxburgh to the Teviot/Ettrick flats the river flows southeast through a mix of hill country and pockets of older flat valley fill deposits<sup>7</sup>.

### 6.1.2 VISUAL VALUES

The Roxburgh Dam and gorge upstream of the dam has high visual values derived from the steep, arid and rocky slopes, and the raw physical impressiveness of the gorge landscape. The river and views of the river are central to visual and scenic values throughout the unit in both the Roxburgh Gorge and Teviot Valley.

Visual values of the Teviot Valley are related to its natural setting below the southern end of the Old Man Range and Mt Bengier and the contrasting and harmonious relationship which has evolved with the fruit growing, horticultural and farming activities on the lower slopes and valley floor. The small settlements dotted neatly along the river and orchard buildings and stone building etc add to visual values.

### Other characteristics

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<sup>7</sup> Boffa Miskell, Natural character, Riverscape & Visual Amenity Assessment

The gold mining era has left its mark on the landscape with many water races and relics from that time adding an historic/cultural overlay to the landscape.

### 6.1.3 LANDSCAPE VALUES

TABLE 1

<b>Value</b>	<b>Rating</b>	<b>Comment</b>
Naturalness	Low	Modified cultural landscape on the valley floor and enclosing ranges. Native shrubland confined to isolated rocky escarpments and hill slopes along the river corridor and on eastern hillslopes.
Legibility	Medium	River processes clearly expressed on the alluvial valley floor. Water and erosional processes expressed within incised side streams and especially in the cut down and entrenched Roxburgh Gorge created by the river over thousands of years..
Tangata Whenua	Medium	The Clutha/Mata-Au was a major pathway and food gathering area for southern Maori. Mahika kai (eg. eels, moa, weka, and other resources) were collected from the Clutha/Mata-Au River. <sup>8</sup>
Aesthetic Factors	Medium	A working horticultural landscape set in an impressive and picturesque natural setting. The industrial infrastructure associated with the hydro dam and scars from construction detract from coherence and visual amenity and at the northern end of the valley.
People and communities shared and recognised values	High	Working landscape associated with rich and productive fruit growing area. Historic stone buildings and relics from gold mining era and early orcharding buildings and structures contributes character and heritage. Clutha Gold Trail provides for enjoyment and appreciation of the Clutha/Mata-Au riverscape and wider Teviot Valley. The big river qualities of the river, including volume and power and the contribution the river makes to the communities economic and social well-being is a shared value.  The good quality soil resulting from river processes and climate which favours fruit growing is also highly valued by the community.
Transient Values	V.High	Marked daily weather and seasonal changes. Autumn colour especially of fruit trees and poplars. Seasonal change from summer to winter is very distinct.
Memorability	Average	A memorable working landscape in an impressive natural setting within the Central Otago landscape. The surrounding enclosing mountains, the large volume, fast flowing river, intensive horticulture, small settlements, gold mining history and seasonal

<sup>8</sup> Beaumont CRR

		effects such as autumn colour combine to create a memorable landscape.
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#### 6.1.4 LANDSCAPE VULNERABILITY

The Teviot Valley floor has a low to moderate landscape vulnerability to change. The working landscape of the valley floor can absorb landscape change. The enclosing hill slopes especially higher up the slopes are visually more sensitive to change.

#### 6.1.5 EVALUATION AND SIGNIFICANCE – CLUTHA/MATA-AU/TEVIOT VALLEY

The Teviot Valley floor is a modified working landscape with fruit growing and horticultural land uses based on the fertile lower slopes and valley floor. The river is the dominant and central feature of the valley. Naturalness on the valley floor has almost entirely been replaced by horticulture and farming and the buildings, infrastructure and settlements associated with those activities. The Roxburgh Dam and infrastructure is a dominant and imposing feature at the northern end of the valley that has to an extent been absorbed by the scale of the landscape.



Photo 1: View SW down Teviot Valley



Photo 2: Roxburgh Dam and Teviot Valley beyond





Photo 3: Lake Roxburgh just above dam



Photo 4: View SW towards Teviot near the Knobby Range



Photo 5: View NE toward dam and Lake Roxburgh



Photo 6: View NE across upper Teviot Valley toward Pinelheugh in distance

## 6.2 LANDSCAPE UNIT 2 (LU<sub>2</sub>) TEVIOT/BEAUMONT DOWNLANDS

### 6.2.1 CHARACTER

The Teviot/Beaumont Downslands is located between the Teviot Valley/Mata-Au unit and the Eastern Central Otago Uplands unit (LU<sub>3</sub>). The eastern enclosing hillslope of the Teviot Valley is within both the Teviot Valley and the Downslands and overlaps both units. The unit boundary on the eastern side is more distinct and coincides with the topographic (and catchment) boundary of the Onslow Basin.

The Downslands also extends south below the Lammerlaw Range (within Beaumont Station). There is a clear visual distinction between the modified pastoral land use present on the Downslands and the more natural appearance of the Eastern Otago uplands (and Onslow Basin).

The landform of the Downslands are rolling dissected hills forming the eastern edge and escarpment of the ancient peneplain of the East Otago Uplands. The Teviot River which drains the Onslow Basin is the largest



and the dominant watercourse within the Downslands flowing west to the Clutha/Mata-Au River. The rolling landform either side of the Teviot River is tilted towards the river but also rises to the east to the ridge which separates the Onslow Basin from the Downslands. The Teviot River is heavily down cut and incised into the scarp along its length. The hillslope (east) above the Teviot Valley is typically dry, modified rocky terrain supporting pasture, thyme and grey native shrubland with short, incised side streams. Rock exposure and outcrops are extensive along the Teviot River sides slopes. To the northeast the downslands gradually rise to the distinctive Pinelheugh ridge. (Pinelheugh 1124m) is oriented northwest on the skyline and parallel with the Knobby Range. South of the Teviot River the rolling landform rises to Mt Teviot (977m) southwest of Lake Onslow.

East of Lake Roxburgh is a sloping terrace perched above the entrenched flooded valley and below the Knobby Range. The terrace is predominantly pasture in contrast to extensive shrubland on the steep rocky side slopes above the entrenched lake. Wilding pines are spreading below the dam wall.

The Downslands especially south of the Teviot River is farmland with grazing paddocks and green winter feed crops and new pasture contrasting with older established pasture. Small conifer plantations and shelterbelts, sparsely located farm buildings, roads following ridge tops are also characteristic including the Lake Onslow Road. Towards Onslow is progressively less modified with some tussock remaining. Large rectangular blocks of semi-mature commercial conifer plantations are a relatively recent but very dominant addition to the landscape. The unnatural shape and dark green colour of the trees stand out against the natural line, form and colour of the natural landscape. Conifer seedlings are spreading around the periphery of the plantations but also towards Lake Onslow and the upland plateau.

The Teviot River is dammed to create Lake Onslow in addition to two small hydro dams downstream and also a small windfarm with three wind towers on the south ridge adjacent to the river.

Electricity transmission pylons and lines from the Roxburgh hydro pass through the unit and follow near the Teviot River to Lake Onslow and beyond.

### 6.2.2 VISUAL AND SCENIC VALUES

The Downslands has average visual and scenic values. It is a pleasant working farm landscape in an elevated location with outstanding views to the adjoining ranges, including views to West Otago and the Blue Mountains. The repetitive rolling landform and dissected gullies are memorable features.

### 6.2.3 LANDSCAPE VALUES – TEVIOT/BEAUMONT DOWNLANDS UNIT

TABLE 1

<b>Criteria</b>	<b>Value</b>	<b>Comment</b>
Naturalness	Medium	Predominantly modified. Tussock remains in some gullies and associated with the Teviot River trench. Also, towards Pinelheugh, Mt Teviot and the ridge separating the Downslands from the Onslow Basin.
Legibility	Medium	The dissected rolling landform on the edge of the ancient Otago peneplain is expressive of tectonic and erosion processes. The deeply dissected

		trench of the Teviot River cut down into the surface is very expressive of formative processes.
Tangata Whenua	Medium	Early Maori routes and mahinga kai through the area is an important aspect of human history.
Aesthetic Factors	Medium	The rolling repetitive, landform pattern is distinctive. The farmed agricultural overlay is typical of agricultural landscapes in the area. The degree of intactness is low. The rectangular dark green forestry blocks stand out and detract from coherence and aesthetic values. It is a transition landscape situated between a culturally modified (Teviot Valley) and the natural East Otago Uplands landscape.
People & communities shared & recognised Values	Medium	Valued by the community as agricultural land which contributes to the Districts livelihood and well-being.  Locals and visitors pass through the Downlands on route to Lake Onslow for recreation or a landscape/backcountry experience.  The power generation on the Teviot River and water for irrigation is valued as a resource by the community.
Transient Values	Medium	Dramatic seasonal change with snow cover in winter often lying for several weeks. Daily light and shadow effects creating by lighting effects on the rolling landform as well as the ever-changing sky and weather patterns are significant and valued by locals and visitors.
Memorability	Medium	The repetitive rolling landform and dissected gullies as well as expansive views to surrounding ranges and areas are memorable.

#### 6.2.4 LANDSCAPE VULNERABILITY

This landscape in one sense is open and exposed and therefore sensitive to change. However, the degree of cultural modification that has occurred from agriculture, forestry, hydro and electricity development suggests capacity to absorb further change.

#### 6.2.5 EVALUATION AND SIGNIFICANCE - TEVIOT/BEAUMONT DOWNLANDS UNIT

The Teviot/Beaumont Downlands Unit is a transitional area between the Teviot Clutha/Mata-Au Valley and is part of the escarpment and edge that leads into the more natural adjoining East Otago Uplands. It has distinctive rolling landform which has either been developed for farming or is in the process of being transformed from a natural landscape to an agricultural landscape. The natural tussock cover has been removed apart from steeper gullies, and the higher eastern ridge leading up to the Onslow Basin as well as north to the Pinelheugh ridge. The Teviot River is the main watercourse draining the Onslow Basin. The river has small hydro dams and a small wind farm on its margin. Electricity transmission lines from The

Roxburgh hydro pass by nearby. Forestry blocks are dominant new features within the unit which have resulted in significant landscape change.



Photo 7 View west across Downslands with Teviot River in centre of photo



Photo 8: Towards Lake Onslow and outlet.

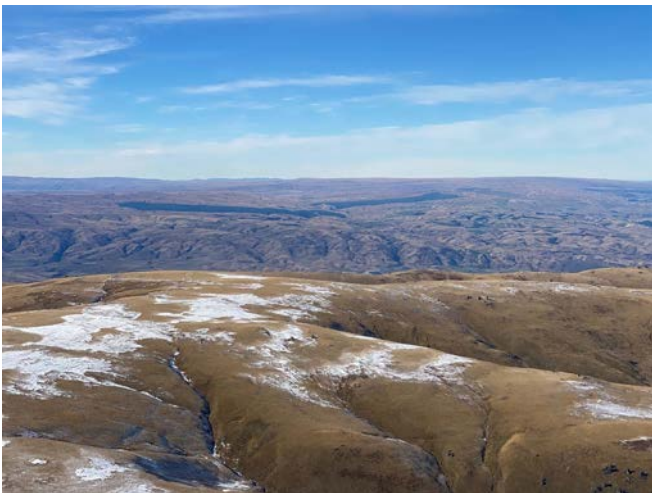


Photo 9: View west from Umbrella Range across Teviot Downslands in middle ground to Onslow Basin.



Photo 10: Teviot River with Lake Onslow in background.



Photo 11: Teviot Downlands.



Photo 12: Teviot River at its lower reaches incised into Downland escarpment

## 6.3 LANDSCAPE UNIT 3 (LU<sub>3</sub>) EAST OTAGO UPLANDS

### 6.3.1 CHARACTER

The East Otago Uplands unit encompasses the whole of the upland plateau with essentially similar characteristics. These upland areas include the Upper Manorburn/Greenland, South Rough Ridge, Lammerlaws/Lammermoors and extending towards the Rock and Pillar Range. Though as a whole there is an overall strongly homogeneous appearance there are also differences between individual areas. These areas are defined and described as:

- Onslow Basin
- Lammerlaws/Lammermoors
- Greenland/Manorburn Basin/Plateau
- South Rough Ridge

Common to the whole of the extensive eastern Otago uplands the landform is undulating, smooth, rolling, often flat crested, dissected hills from about 500m to over a 1000m with a repetitive pattern of ridges and spurs extending as far as the eye can see sometimes backdropped with the distant higher ranges of Otago.

Tussock both tall and short (typically tawny brown colour and fine textured) is a dominant and unifying element across the whole area in varying condition. There are wide basins such as Lake Onslow with broad ridges separating the catchments as well as smaller basins like Teviot Swamp. The basement rock of the upland plateau is Otago schist and formed by folding and uplift and subsequent erosion, and creating the relatively flat summits typical of the Otago peneplain. Stream beds between ridges are fluvial deposits. Extensive and important wetlands are a feature of the Upland such as Teviot Swamp, Red Swamp and Middle Swamp.

Where the headwaters of the Teviot and Taieri Rivers leave the upland plateau, they have cut down to the plains below often forming steep entrenched gorges with prominent rock outcrops and exposure.

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outcrops are generally absent in the southern areas and eastern areas of the upland plateau which is unusual in the context of Central Otago but are extensive on South Rough Ridge and the Manorburn area.

The scale of the upland is immense. Expansive, open, limitless, big sky, simplicity, bleak, desolate, are characteristics or descriptions that are used to describe the area. While there are obvious signs of cultural modification, the entire area has a high degree of naturalness and natural character and significantly appears as a natural landscape. The main types of cultural modification are the presence of large man-made reservoirs (Lake Onslow, Greenland and Upper Manorburn, Poolburn, and Logan Burn Reservoirs). These are located within natural basins and over time have softened and are now accepted parts of the landscape.

Other man-made features across the upland area include tracks and backcountry roads, transmission pylons and lines, fishing huts associated with the reservoirs and occasional fences and gates. The Lake Onslow Road forms a narrow sinuous line across the landscape. In relatively small areas tussock has been converted to pasture such as the flats to the north and west of Lake Onslow (within the Onslow Basin).

### **Subunit (a) Lake Onslow Basin**

The Onslow Basin is one of the largest basins of the upland area. In the west it is bounded by Mt Teviot and south by the Lammerlaw Ridge. Armstrong Creek, the South Branch of Teviot River and Fortification Creek flow north and northeast from the flanks of the Lammerlaw Range into Lake Onslow. Boundary Creek also drains northeast into the lake from Mt Teviot and Watty's Knob. The east boundary is the ridge immediately east of the lake and north a low saddle at the head of the North Branch of the Teviot River. The lake forms a roughly horseshoe shape with fingers extending up drainage lines following contours with some small islands above the waterline. The lake is subject to considerable fluctuations in water level with the shallow flats exposed around the periphery of the lake when low. These are visible as dark brown mudflats which can extend quite some distance up drainage lines depending on the lake level.

A special and defining feature of Lake Onslow are the wetlands streams draining into the lake, notably Fortification Creek, the South Branch of the Teviot River, Middle Swamp (latter from an unnamed stream below Watty's Knob) and wetlands associated with Boundary Creek. A feature of these are significant meandering sections with oxbow lakes. These are characterised by island-like centres where they have been cut off by the river.

The Onslow wetlands though still large would have been much more extensive before being drowned when the lake was formed.

The dominant vegetation surrounding Lake Onslow is tussock grassland but on the flats to the north and west of the lake tussock has been cultivated and is now 'green' pasture. These areas are being more intensively farmed with new pasture, winter crops and paddocks contained by fences and paddocks cut for winter hay.

Tussock is also replaced by a large forestry block planting on the SW flank within the upper Onslow Basin from Mt Teviot towards Lammerlaw Tops. The dark green conifers appearing dominant, incongruous, and out of context in this essentially natural tussock landscape. Wilding douglas fir seedlings are visible spreading around the lake.

Grazing has also impacted on the condition of tussock grassland in other areas of the basin most notably on the western side of the lake where cattle have been grazing.



On the west side near the outlet to the Teviot River are a number of recreational fishing huts on the edge of the lake.

Other human induced features are the Lake Onslow Road passing around to the north of the lake and the pylons of Roxburgh-Three Mile Hill transmission lines which bisect the northern end arm of the lake standing out against the sky and water.

### **Subunit (b) Lammerlaws/Lammermoors**

The Lammerlaws and Lammermoors includes a major part of the East Otago Upland and extends from the Lammerlaw Range ridge and 'Top' and including the Lammermoor Range. The latter appears as a broad flat-topped ridge and extends in a northeast direction at a right angle from the Lammerlaw Crest. The Papanui Conservation Park and the Logan Burn Reservoir are south eastern and eastern limits of this expansive area before rising to the higher Rock and Pillar Range.

This area retains the characteristic gentle rolling, smooth spurs dissected by an intricate drainage network and homogenous cover of golden tussock, an iconic and characteristic feature of the Lammerlaws and Lammermoors. Scattered schist outcrops are associated with stream sides and sides of spurs. Snowbank on higher parts and wetlands are numerous including the larger Teviot Swamp. The Logan Burn Reservoir occupies a large natural basin drained by the Logan Burn between the southern end of the Rock and Pillar Range on the east side above Paerau with Soutra Hill (1015m) and Spillers Hill (960m) high points. The Logan Burn Reservoir has a similar landscape setting to Lake Onslow surrounded by tussock in all directions.

### **Subunit (c) Greenland Manorburn Basin/plateau**

The Greenland Reservoir occupies a shallow valley some 11km north of Lake Onslow. Part of the valley flows south to Lake Onslow and northern end flows north to the Greenland Reservoir within the Manorburn catchment. Gently, rounded forms covered by a mantle of homogenous tussock stretch into the distance varied by bright green wetlands in the depressions. The landmark Long Valley Scarp emerges near the Greenland Reservoir by Long Valley Stream and runs northeast in a straight line a distance of about sixteen km to form the backdrop to the Poolburn Reservoir. The steep scarp rises over 300m from the valley floor and is peppered with rock outcrops especially noticeable along the skyline<sup>9</sup>. The Manorburn Reservoir like the Greenland Reservoir is similarly enclosed by gentle, sculptured rounded forms and tussock draining northwest to the Manuherikia River via the Manorburn.

### **Subunit (D) South Rough ridge**

South Rough Ridge separates and stands out (west) above the Styx/Paerau Basin and from the Long Valley Creek and Greenland Reservoir. South Rough Ridge Hill (1166m) is the highest point. Rock outcrops and tors are a significant feature of South Rough Ridge in contrast to the southern areas of the Upland Plateau.

South Rough Ridge also stands out and is visible over a wide area of the rolling upland plateau.

### **Visual and Scenic Values**

The upland plateau as a whole has very high visual and scenic values. This is a factor of the expansive nature and the repetitive and recurring landform of smooth spurs and ridges and dissected drainage pattern and

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<sup>9</sup> Manorburn Ecological District. Landscape Survey

the dominant homogenous tussock grassland which mantles and unifies the whole area. Distant views to surrounding Central Otago Ranges are also significant in visual terms.

The Onslow Basin also has high visual values in part due to being part of the greater upland landscape but also due to the characteristics and features of the lake and basin in isolation of its broader context. The presence of the lake and water body contributes positively to visual values depending on the perception of the viewer. The forestry plantation and the farm development close the lake detracts from visual values but similarly is dependent on the perceptions of the viewer. For example, a forester or farmer are likely to see these changes as positive. This assessor as a landscape expert sees these elements as detracting from natural landscape and visual values.

### Other Characteristics

The back country character, sense of isolation and wildness and a very strong sense of place are part of the landscape values of the areas. The presence of wildlife such as falcon, harrier hawk and geckos contribute to character.

## 6.3.2 LANDSCAPE VALUES EVALUATION - EAST OTAGO UPLANDS

TABLE 1

<b>Criteria</b>	<b>Value</b>	<b>Comment</b>
Naturalness	Medium to High	Overall a high degree of natural character. Natural characteristics are dominant and intact despite human induced changes. The reservoirs are the most obvious and significant man-made element across the upland area. Tussock is diminished and depleted in places due to grazing and burning history.
Legibility	High	Folding, uplift and erosion processes are expressed in the gently rolling landform, flat summits, and the highly legible dissected drainage pattern. The schist bedrock is visibly expressed in outcrops and tors more pronounced in some areas than others. The extensive wetlands eg Fortification Creek, cut off by the stream to create the characteristic meandering sections with oxbow lakes and island-like centres are clearly expressive of their formative processes.
Tangata Whenua	High	The historic/cultural overlay of early Maori routes and mahinga kai through the area is an important aspect of human history.
Aesthetic Factors	High	The entire upland plateau has a high level of distinctiveness and is striking and impressive. It has a high level of coherence derived from the repetitive rolling landform and the unifying effect of the dominant tussock vegetation cover. Within this high level of coherence is also subtle diversity of features and characteristics such as the wetlands and alluvial surfaces between the folds in the land and the presence of rock exposure piecing the tussock mantle in places but not in other areas.
Transient Values	High	Highly valued for daily, seasonal and weather changes and spectacular lighting effects on the landform and tussock grassland. Other transient values are the effects of tussock blowing in the wind across the moors,

		and of water droplets on the tussock leaves in rain or fog and snow lie for extended periods. Presence of wildlife is also important.
Peoples & communities shared & recognised values	High	The whole of the East Otago Upland Area is recognised as an outstanding natural landscape with ecological and landscape values increasingly being recognised and appreciated. <sup>10</sup>  Whole area is valued by the community for recreation including fishing, mountain biking, hunting, horse riding, and backcountry landscape experience.  Private and pastoral lease lands valued for summer grazing.
Memorability	High	Distinctly Otago landscape. A unique and highly memorable landscape,

### 6.3.3 LANDSCAPE VULNERABILITY

The Onslow Basin and the greater upland plateau as a whole is highly vulnerable to changes on a number of levels.

Changes that affect the naturalness and natural character of the landform and the dominant vegetation characteristics (tussock and wetlands) are the most vulnerable aspects of the landscape. This can be from earthworks, vegetation clearance, farm development, creation of reservoirs etc. Related to this is domestication or changes that impact on the openness and backcountry, semi-wilderness, and natural values of the Onslow Basin/Upland Plateau. This could be from buildings, structures, roads, infrastructure, or any form of human change.

### 6.3.4 EVALUATION AND SIGNIFICANCE – EAST OTAGO UPLANDS UNIT

The whole of the East Otago Uplands including the Onslow Basin is recognised as an Outstanding Natural Landscape (ONL) and which has been confirmed by the Environment Court by the Project Hayes Decision.

The CODC District plan differentiates between ONL on the Rock and Pillar Range, the Lammerlaws and Lammermoors, Greenland/Manorburn/South Rough Ridge and Landscape Management Area (LMA) for the Onslow Basin and an area of the upland plateau either side of the Onslow Basin which would suggest a lesser significance to LMA areas.

This assessment considers all of the Upland Plateau is ONL including the Onslow Basin and collectively is at least of regional significance and more likely of national significance.

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<sup>10</sup> Otago CMS





Photo 13: View SW Onslow Basin



Photo 14: View N/NW of Greenland and Upper Manorburn Reservoirs



Photo 15: View west across Onslow Basin. South Branch of the Teviot River and wetlands on left. Forestry encroaching into Onslow



Photo 16: View west. Red swamp in foreground



Photo 17: View north along east ridge of Onslow Basin with North Branch of the Teviot River in background



Photo 18: View NE. Teviot River South Branch wetlands in foreground





Photo 19: View NE with Teviot River South Branch in foreground and Styx Basin in background



Photo 20: View NE across Lake Onslow



Photo 21: View NE across cultivated flats and Teviot River outlet on left



Photo 22: View NE with Teviot River on left with expansive upland in the background



Photo 23: View NE near possible dam site for raised lake



Photo 24: View NE across Greenland Reservoir with Long Valley and Long Valley Scarp in centre of image

## 7 PROPOSAL FOR NZ BATTERY PROJECT

The NZ Battery Project is at an preliminary stage of the investigation into the options and is awaiting further Geotech and hydro engineering work. When this is completed further assessment of effects of the proposal on landscape values will need to be undertaken. At this time the known aspects of the proposal include the following:

- Raising the level of Lake Onslow to between 740 and 800m asl. Options include 3-9TWh
- New dam wall downstream of the existing wall (dependent on Geotech and hydro engineering investigations). The wall is likely to be an earth wall possibly over 2km long and up to 120m high depending on the options (3-9TWh).
- Large scale infrastructure which could include a large underground cavern near the dam wall with vertical tunnel to a machine hall.
- Low pressure tailrace tunnel out to Lake Roxburgh or to a stilling reservoir further down river
- Generation plant and infrastructure near Lake Roxburgh (at least an intake/outtake structure)
- Redirected transmission pylons and lines around the extended lake and new lines from new machine hall (wherever that is) to nearby new substation
- Upgraded Lake Onslow Road
- Deposition of tunnel boring excavation material
- Fluctuations in lake level of raised lake
- Disturbance associated with drilling rig investigations and access tracks

## 8 LANDSCAPE ISSUES/EFFECTS

The section outlines the issues and possible effects that could be expected on landscape and visual values based on known information.

### **Raising the level of Lake Onslow to between 740 and 800m asl. (Options include 3-9TWh) and new dam wall.**

In order to understand the likely effects on landscape and visual values the receiving landscape and environs needs to be understood. From the above assessment the Onslow Basin is a predominantly natural landscape but not pristine with numerous cultural modifications. These include (for both the Onslow Basin and the wider upland area), existing large reservoirs which are now an expected part of the wider upland plateau landscape.

In addition, the natural landscape values of the Onslow basin have been reduced or compromised to a degree by the forestry on the SW flank of the Onslow Basin (east of Teviot Peak) and to a lesser extent the cultivated paddocks on the flats to the west and north of the lake and the wilding tree seedling spread that is occurring. The western side of the lake also indicates that grazing pressure (including cattle grazing) has impacted on the condition of the tussock grassland.

All the level options for raising the lake are physically contained within the natural boundaries of the Onslow Basin and do not spill over into the generally more natural eastern Taieri catchment. Approximately 50% of the Onslow Basin would be flooded by the highest lake level (800m). Being contained to the Onslow Basin has the effect of containing (and confining) the effects of raising of the lake level and the infrastructure for the project largely to the Onslow Basin which is possibly the most modified part of the whole upland area (certainly more modified than the Lammerlaw and Lammermoor Ranges).



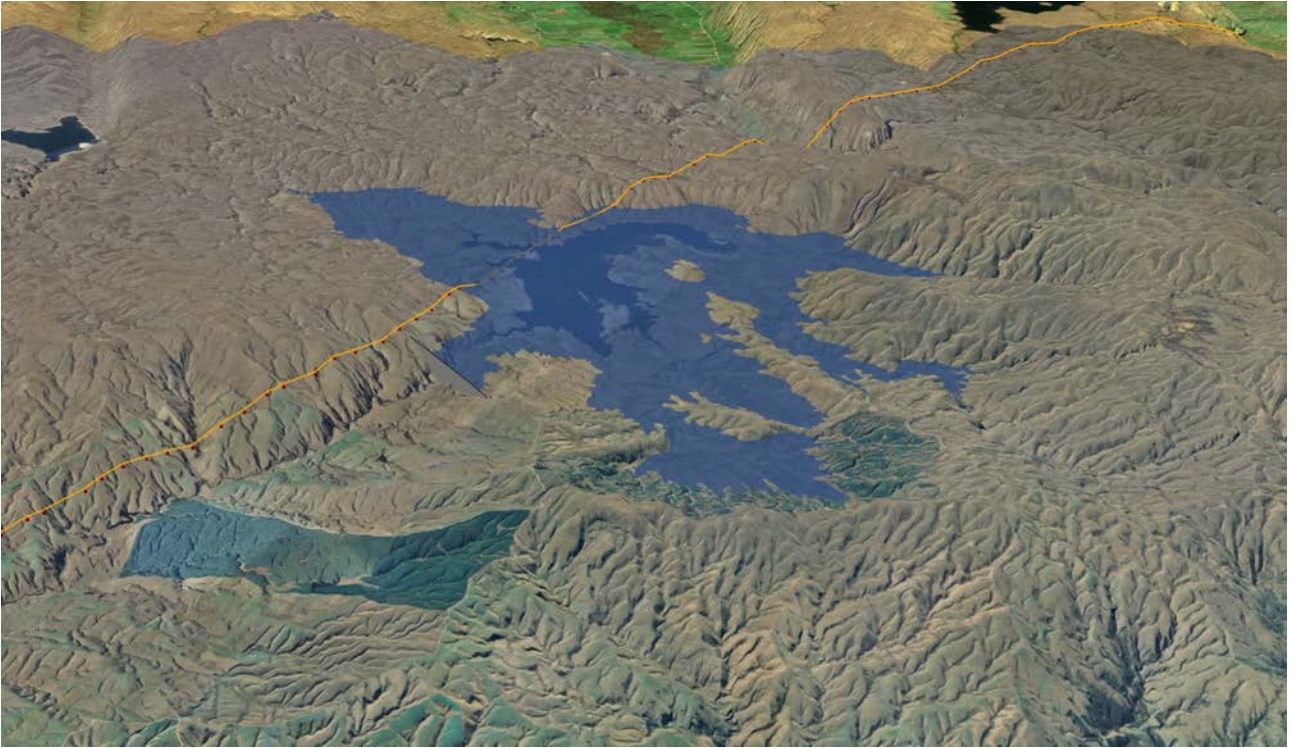
Related to this is the Onslow Basin is on the edge (western side) of the upland plateau rather than a more centralised location where it might have greater impact on landscape values.

The downside is significant areas of tussock and other indigenous vegetation will be lost with consequent loss of naturalness from the raising of the lake and most significantly the loss of the wetlands. The wetlands streams draining into the lake, notably Fortification Creek, the South Branch of the Teviot River and Middle Swamp and Boundary Creek wetlands. These special features including meandering sections with oxbow lakes will be lost.

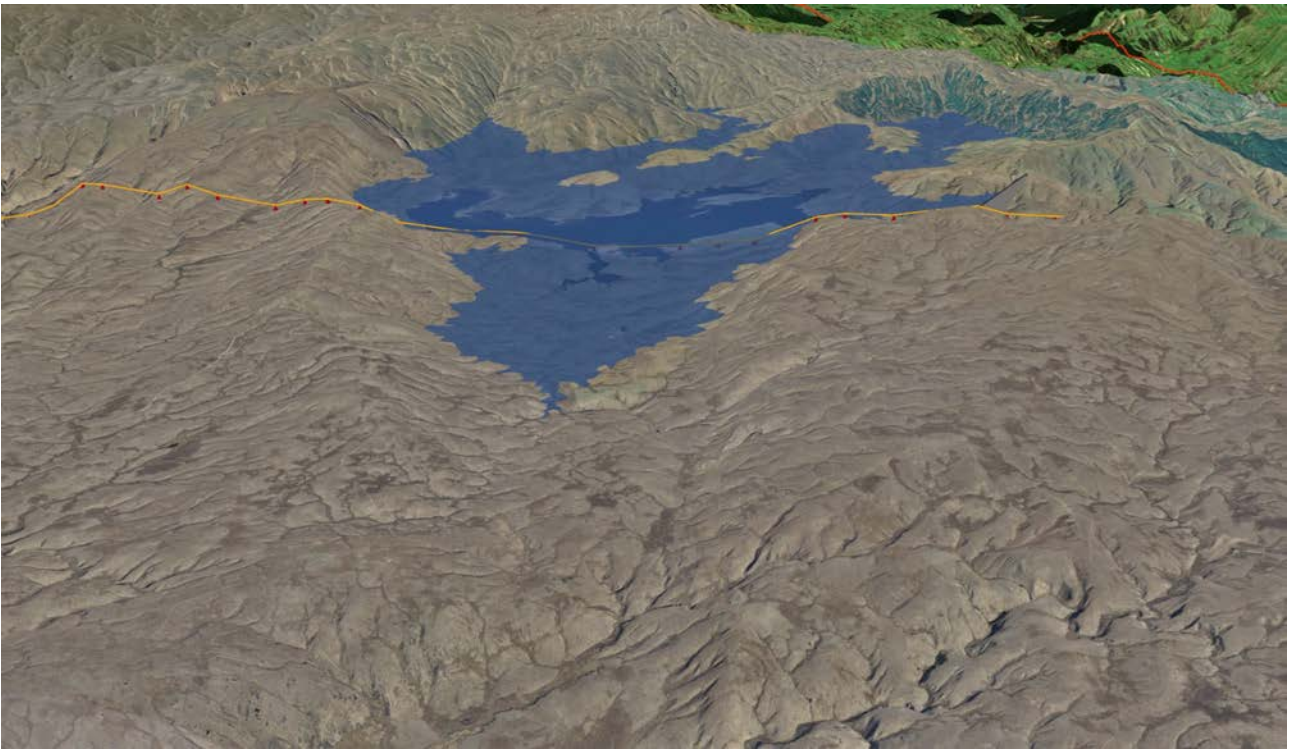
There is likely to be some loss of scale and a reduction in the expansiveness of the East Otago Uplands as a whole by the presence of a massive man-made water body and effects on the backcountry/remoteness feel of the area from the domesticating effect of a large man-made reservoir. All the level options would result in a lake that was considerably larger than any of the existing reservoirs in the East Otago Uplands.



800m inundation level (viewed from Southwest)

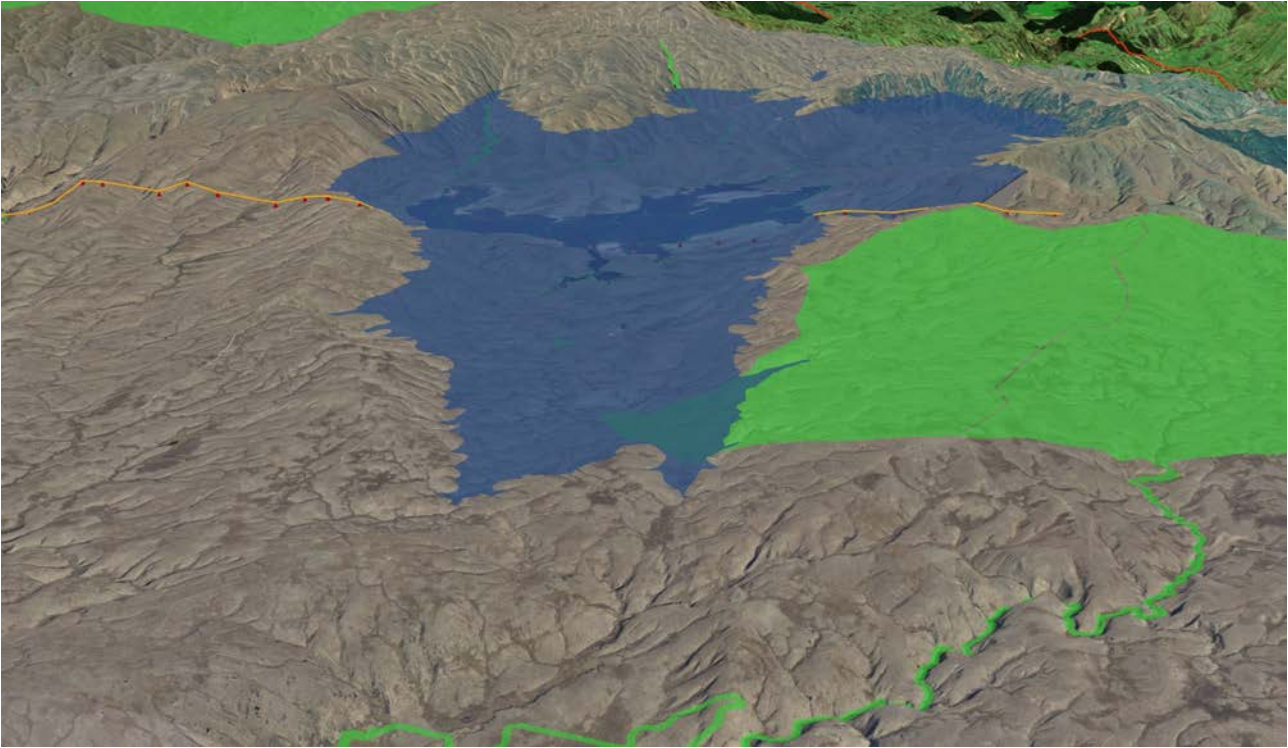


740m inundation level (viewed from Southwest)



740m inundation level (viewed from North)





800m inundation level and DOC Conservation Lands (viewed from North)

### **Landscape and visual effects of different lake levels (refer Maps 2-5)**

All the possible proposed lake levels (between 740 and 800m asl.) are likely to have reasonably similar landscape and visual effects. The main effect is the massively increased lake from the current level in comparison to any one of the proposed options. The higher options clearly will occupy a greater area of the Onslow Basin and the surface area of the lake will be greater but for landscape and visual values the effects will not be greatly different. With all the options, the special wetlands are inundated which is the most significant effect of the raising of the lake on landscape and visual values.

The effects of all options will be a substantially larger water body but still contained within the natural basin.

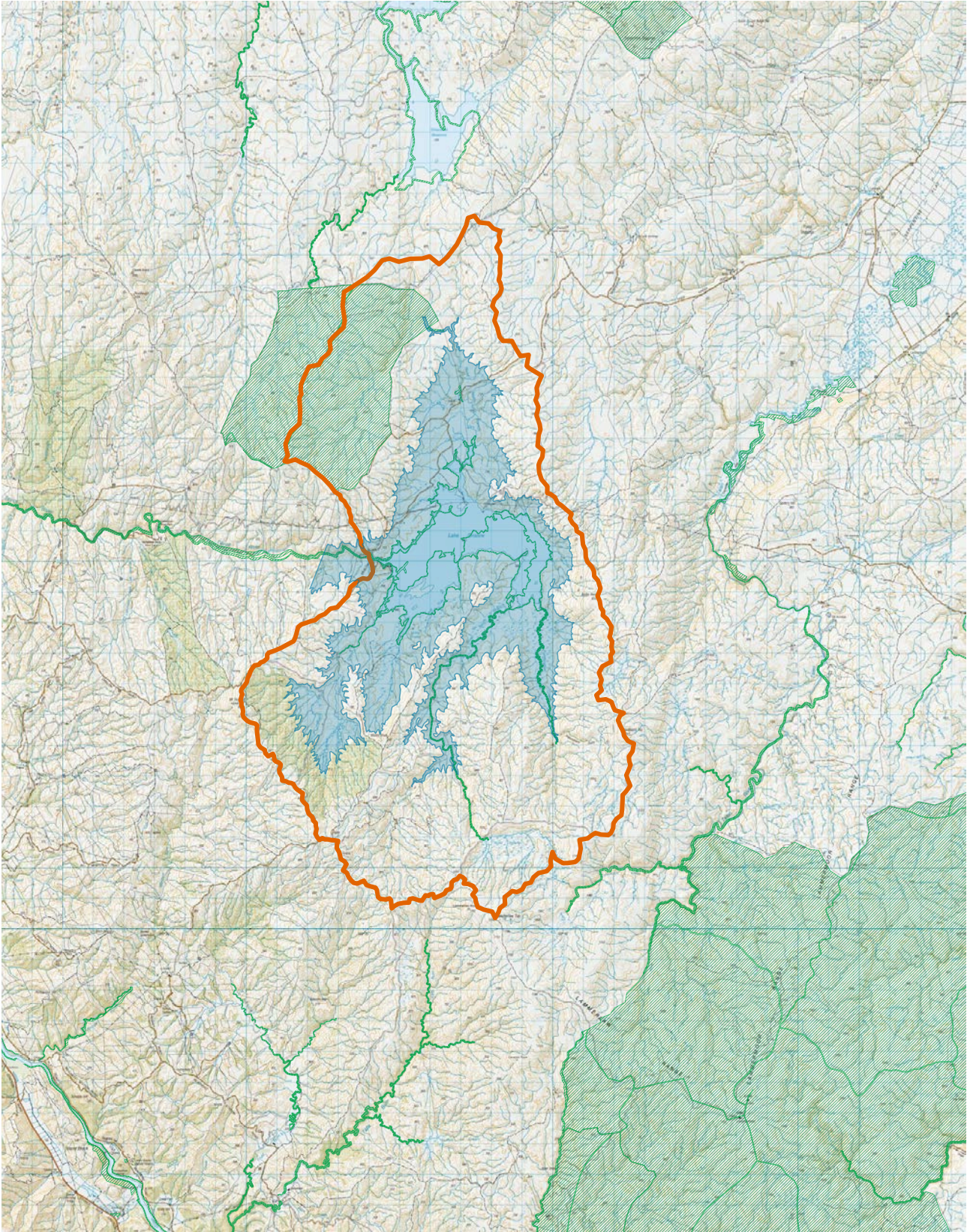
In terms of where the raised lake will be viewed from. A detailed visibility study is beyond the scope of this assessment, but it could be expected that the raised lake (all options) would be visible from a large number of viewpoints and certainly many of the high points over a wide area of the upland plateau.

Conversely there are likely to be large areas where the raised lake would not be visible such as on the Lammermoors and the southeast sector where higher topography intervenes and in the many lower spurs and ridges leading into the incised gully's of the Taieri headwaters.

The raised lake would have limited visibility from the west outside the Onslow Basin (within Landscape Unit 2) due to the masking effect of topography on that side.




From locations where the lake will be able to be viewed, distance from the lake will be a key factor in determining effects. The greater distance from the raised lake will diminish the size of the water body with consequent reduced effects. The large scale and vastness of the upland area will assist with diminishing and absorbing the raised lake level especially from eastern parts of the upland plateau.



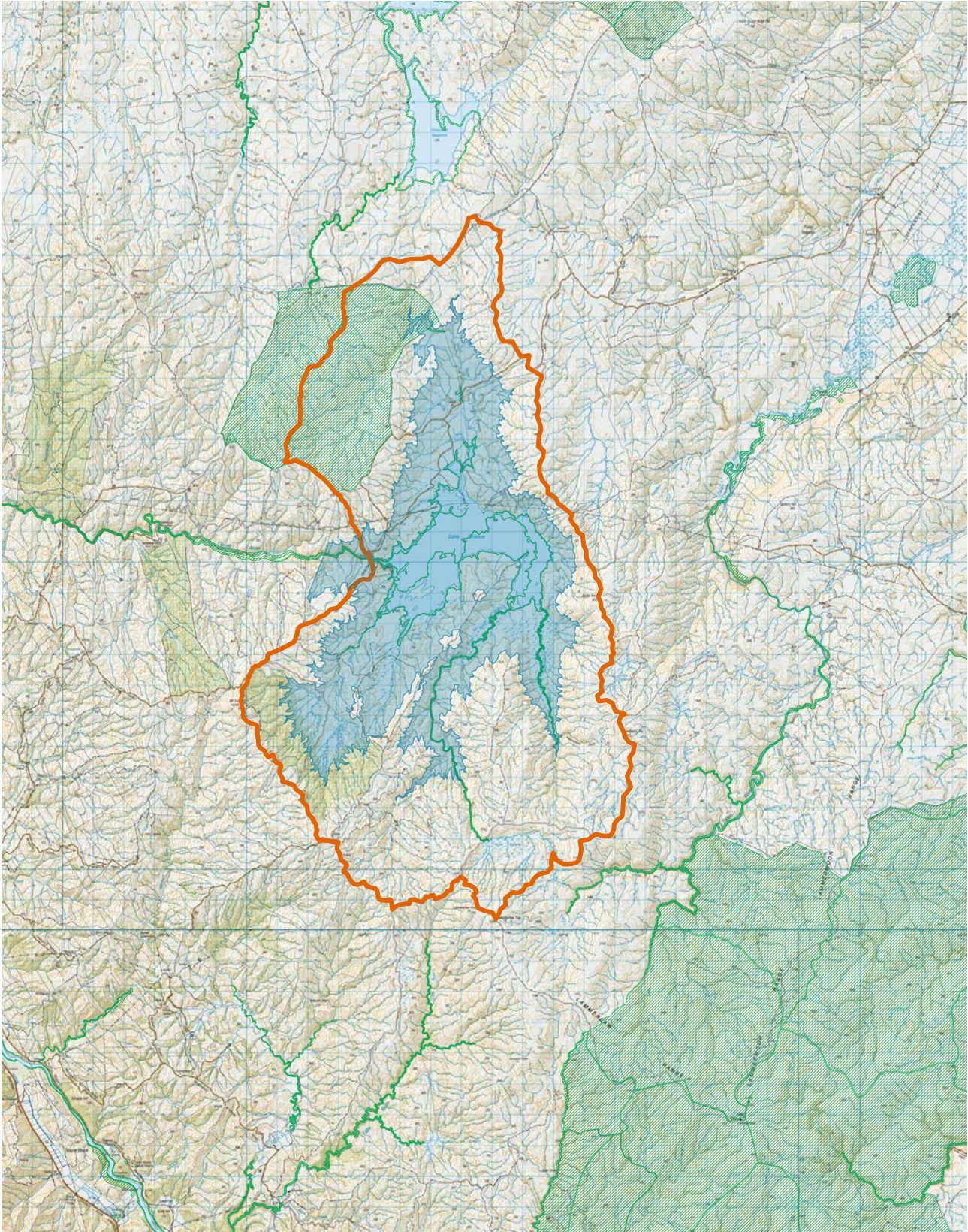


2

Lake Level 740m  
Scale: 1:150000




- Legend
-  Onslow Basin Catchment
  -  Conservation Land (DOC)
  -  Area of Proposed Inundation



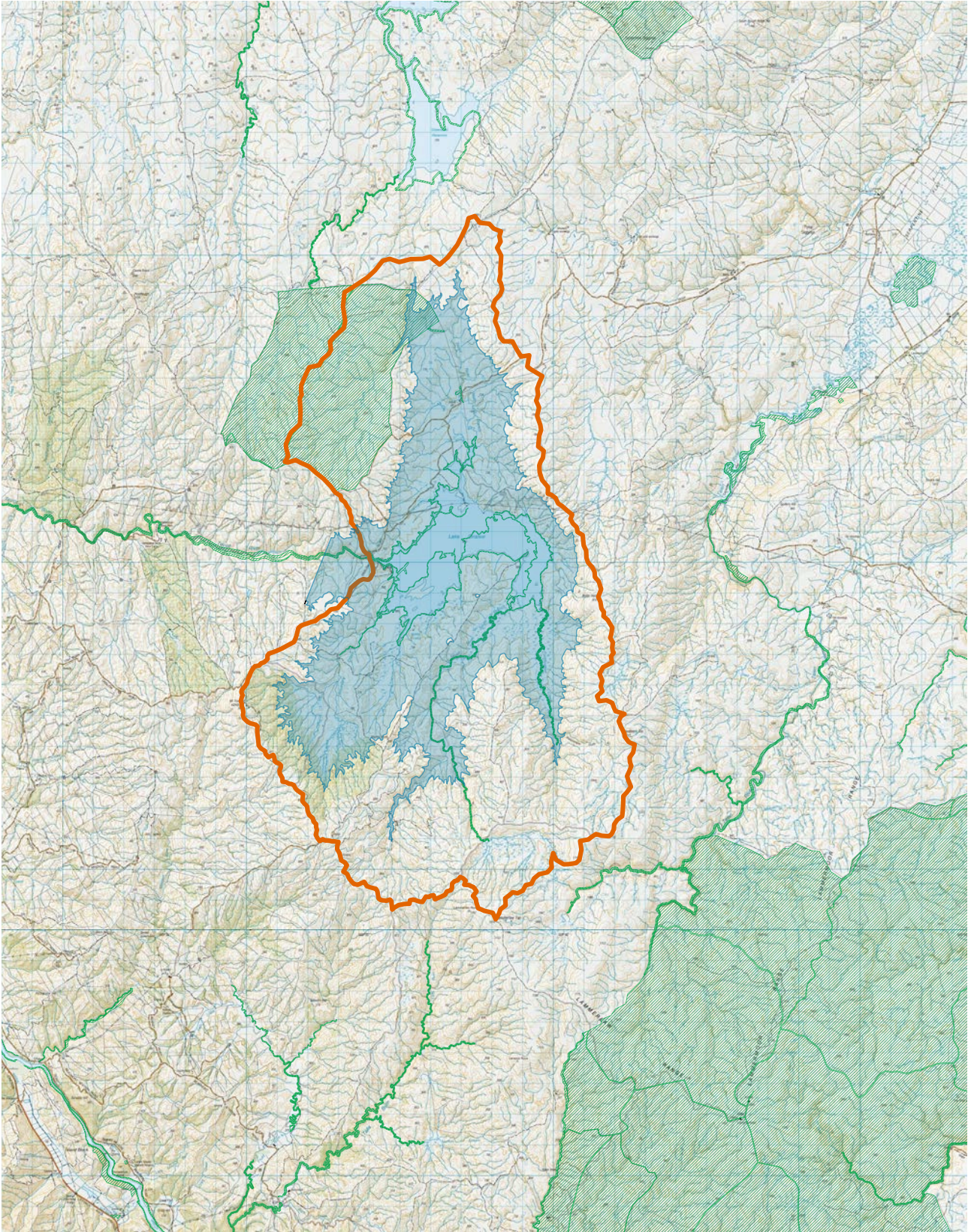


3

Lake Level 760m  
Scale: 1:150000




- Legend
-  Onslow Basin Catchment
  -  Conservation Land (DOC)
  -  Area of Proposed Inundation



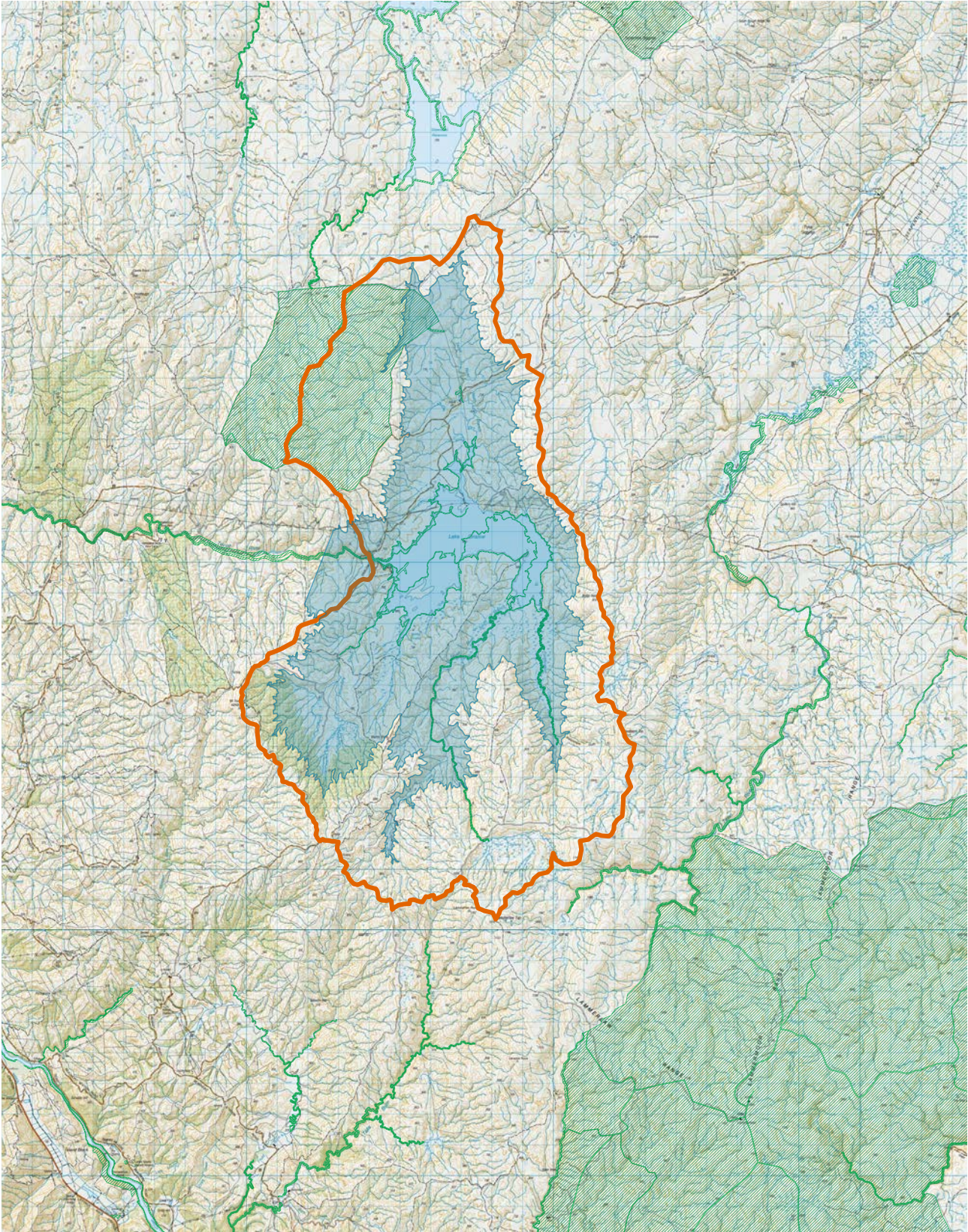


4

Lake Level 780m  
Scale: 1:150000




- Legend
-  Onslow Basin Catchment
  -  Conservation Land (DOC)
  -  Area of Proposed Inundation





5

Lake Level 800m  
Scale: 1:150000

- Legend
-  Onslow Basin Catchment
  -  Conservation Land (DOC)
  -  Area of Proposed Inundation



## **Effects of New Dam wall and of large-scale infrastructure**

The proposed new dam wall is expected to be over 2km long and up to 120m high at its highest point and is likely to be of earth construction similar to Lake Benmore. This is a much larger wall than the existing Lake Onslow dam and will be a major new man-made element.

The location of the wall on the edge of the upland plateau will assist to minimise its effects on the wider upland area and contain landscape and visual effects to the western edge of the upland plateau (LU3).

There will be localised landscape visual effects to the upper eastern side of the Teviot/Beaumont Downlands landscape unit (LU2). The earth construction will assist to absorb and soften the effects of this large infrastructure feature into the landscape. The location and design of the wall will be an important factor in how it 'sits' in the landscape. There will be massive disturbance and earthworks associated with the construction zone of the dam wall.

The effects of a possible large underground cavern and large tunnel tailrace possibly near the dam wall will have minimal effects from the structures themselves if undergrounded. The greatest effect will be from the location/how the excavated material is disposed of. Presumably some is likely to be used for the dam wall construction but there will be huge quantities of material to dispose of.

If generating plant is located at the new dam wall associated with a machine hall this will have major landscape and visual effects from the industrial appearance of generating plant and extensive wires and pylons in this semi-natural landscape.

## **Low pressure tailrace tunnel out to Lake Roxburgh or/ stilling reservoir further down river and generation plant and infrastructure near Lake Roxburgh**

The tailrace tunnel will be underground and therefore effects will also be related to where and how the excavated material from the tunnel boring machine is dealt with.

Generating plant and infrastructure near Lake Roxburgh will be large in scale and industrial in appearance. These types of industrial scale structures are already associated with the Roxburgh Dam Hydro which suggests that additional similar plant and infrastructure can be co-exist and be absorbed here. The narrowness of the Teviot Valley near the Roxburgh Dam and the scale of the landform either side of the hydro infrastructure has the effect of containing and reducing the scale of the infrastructure due the scale of the receiving environment.

## **Redirected Transmission pylons and lines around the extended lake and new lines from new machine hall (wherever that is) to nearby new substation**

The effects of redirected transmission pylons and lines around the extended lake are likely to be similar to the existing lines unless there are a doubling of pylons and lines in which case that would be an additional major landscape and visual impact.

New lines from a machine hall located near the proposed new dam (as discussed above) would also be a significant landscape and visual issue. A machine hall near the Roxburgh dam (with generating plant) would be a preferable option compared to near the new Lake Onslow dam because of the potential landscape and visual effects of generating plant and infrastructure would have around the dam area.

## **Fluctuations in lake level**

Without knowing what the fluctuations in lake level are, it is difficult to assess the effects. Fluctuations in lake level occur with the existing Lake Onslow and results in brown mudflats when the lake is low. Generally it could be expected that changes in level will have the effect of reducing naturalness and natural character.

## Upgraded Lake Onslow Road and disturbance associated with drilling rig investigations and access tracks

An upgraded Lake Onslow Road can be accommodated with minimal impacts on landscape values provided the existing route is used and with appropriate conditions for earthworks rehabilitation.

Access tracks for drilling rig investigations can be absorbed with the Downlands landscape unit with appropriate conditions for rehabilitation including reinstating earthworks and replacing vegetation cover at the end of investigations.

### Scale of Effects

The Aotearoa New Zealand Landscape Guidelines prepared by the New Zealand Institute of Landscape Architects (ratified April 2021) includes a seven point scale of effects.

The seven point scale used to describe the effects are:

- **Very High:** Total loss to the key attributes of the receiving environment and/or visual context amounting to a complete change of landscape character
- **High:** Major change to the characteristics or key attributes of the receiving environment and/or visual context within which it is seen; and/or a major effect on the perceived amenity derived from it.
- **Moderate-High:** A moderate to high level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate-high level of effect on the perceived amenity derived from it.
- **Moderate:** A moderate level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate level of effect on the perceived amenity derived from it. (Oxford English Dictionary Definition: Moderate: adjective-average in amount, intensity or degree).
- **Moderate-Low:** A moderate to low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate to low level of effect on the perceived amenity derived from it.
- **Low:** A low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a low level of effect on the perceived amenity derived from it. (Oxford English Dictionary Definition: Low: adjective- below average in amount, extent, or intensity).
- **Very Low:** Very low or no modification to key elements/features/characteristics of the baseline or available views, i.e. approximating a 'no-change' situation.

As a guide to the scale of effects, the NZ Battery Project is assessed as High for the Onslow Basin and proposed dam site area which is just outside the Onslow Basin. However for the wider East Otago Uplands is assessed as a Moderate -Low Effect.



## 9 CONCLUSIONS

The main conclusions from the landscape and visual assessment are:

1. The area affected by the NZ Battery Project includes from the Teviot Valley east across the Teviot Downslands centred on the Teviot River corridor and up into the Onslow Basin with wider effects over an extended area of the Upland Plateau.
2. The three distinct areas forming the landscape units for this assessment are a continuum in terms of naturalness with the Teviot Valley being the most modified, the intermediate Downslands (in the process of being transformed from a natural landscape to a predominately agricultural landscape), and the Onslow Basin and wider upland plateau a predominately natural landscape.
3. The whole of the East Otago Uplands (including the Onslow Basin) is as an Outstanding Natural Landscape probably of national significance (though the Central Otago District Plan differentiates the Onslow Basin as Landscape Management Area which suggests lesser significance (in terms of the District Plan).
4. The Onslow Basin (and the whole of the upland plateau) is not a pristine natural landscape and has obvious cultural intrusions and features, but natural characteristics predominate.
5. Reservoirs are an accepted part of the East Otago upland landscape. The options for the NZ Battery Project would result in a waterbody much larger than any of the existing reservoirs.
6. The Onslow Basin is on the western edge of the East Otago upland landscape and is probably the most modified basin of the whole upland area and certainly more modified than the Lammermoor and Lammerlaw Ranges and areas further east.
7. All the level options for a proposed reservoir are physically contained within the natural boundaries of the Onslow Basin. This contains the disturbance and some of the landscape and visual effects of raising the lake level to the Onslow Basin and areas west of the Onslow Basin where supporting infrastructure would be located.
8. All the possible proposed lake levels (between 740-800m asl) are likely to have similar landscape and visual effects. The main effect is the massively increased lake from the current level in comparison to any one of the proposed options.
9. The raised lake (all options) would be visible from a large number of viewpoints and certainly many of the high points over a wide area of the upland plateau, but this would not necessarily result in a major impact for landscape and visual values. The scale of the upland area will assist with absorbing the size of the raised lake.
10. There will be significant loss of tussock and other indigenous vegetation within the Onslow Basin. The loss of the extensive and special wetlands and features within the Onslow Basin will be the greatest impact for landscape and visual values of raising the lake.
11. The effects of the dam wall and other large-scale infrastructure (known at this time) can be accommodated within the Teviot Beaumont Downslands and the Clutha/Mata-Au/Teviot Valley landscape units.

12. Generating plant and infrastructure located at the Onslow dam wall would have major landscape and visual effects and would be preferable co-located alongside or near existing Roxburgh hydro infrastructure.
13. Disposal of excavated material from machine room and tunnel excavation will be a major landscape and visual issue.

## 10 REFERENCES

- Boffa Miskell Ltd. Natural character, Riverscape and Visual Amenity Assessments Clutha/Mata-Au, 2018.
- Central Otago District (CODC). Rural Review. Landscape Assessment and Report Review, 2007.
- Central Otago District . Operative District Plan.
- Department of Geology, Otago University. Geology and Gold on Otago's North Eastern margin.
- Environment Court of NZ. Maniototo Environmental Society Incorp.v CODC Decision (2009) NZ Env. (293)
- Department of Conservation. Otago CMS, 2016
- Department of Conservation. Conservation Resources Report (CRR) Beaumont Station
- Department of Conservation. Evidence of Philip Blakely for Director General of Conservation on Proposed Plan Change 5A to 5W, to CODC. July 2010.
- NZILA. Aotearoa Landscape Assessment Guidelines. Final Draft April 2021.
- P. Smith, Department of Conservation. Manorburn Ecological District Landscape Survey. Unpublished 1988-89.
- Wikipedia. Lammerlaw Lammermoor Ranges.

## 11 APPENDICES

### 11.1 APPENDIX 1: RELEVANT OBJECTIVES AND POLICIES OF CENTRAL OTAGO DISTRICT PLAN (CODP)

Relevant objectives and Policies are:

*NZ Battery Project: Landscape & Visual Assessment (FINAL) Blakely Wallace Associates, August 2021*

**Objective 4.3.2** Outstanding Natural Landscapes and Outstanding Natural Features, and land in the Upper Manorburn/Lake Onslow LMA. To protect the Districts ONLs and ONFs and land in the Upper Manorburn/Lake Onslow LMA (including landforms) from the adverse effects of inappropriate subdivision, use and development.

**Policy 4.4.1-** Outstanding Natural Landscapes and Outstanding Natural Features and Land in the Upper Manorburn/Lake Onslow Landscape Management Area To recognise the District's outstanding natural landscapes and outstanding natural features and land in the Upper Manorburn/Lake Onslow Landscape Management Area which:

- (a) Are unique to the district, region or New Zealand; or
- (b) Are representative of a particular landform or land cover occurring in the Central Otago District or of the collective characteristics and features which give the District its particular character; or (c) Represent areas of cultural or historic significance in the district, region or New Zealand; or
- (d) Contain visually or scientifically outstanding geological features; or (e) Have characteristics of cultural, historical and spiritual value that are significant to Kai Tahu ki Otago;
- (f) Have high natural character values and high landscape quality that can be distinguished from the general landscapes of the Central Otago District and provide protection for them from inappropriate subdivision, use and development.

**Policy 4.4.2** Landscape and Amenity Values

To manage the effects of land use activities and subdivision to ensure that adverse effects on the open space, landscape, natural character and amenity values of the rural environment are avoided, remedied or mitigated through:

- (a) The design and location of structures and works, particularly in respect of the open natural character of hills and ranges, skylines, prominent places and natural features,
- (b) Development which is compatible with the surrounding environment including the amenity values of adjoining properties, (c) The ability to adequately dispose of effluent on site,
- (d) Controlling the generation of noise in back country areas,
- (e) The location of tree planting, particularly in respect of landscape values, natural features and ecological values,
- (f) Controlling the spread of wilding trees.
- (g) Encouraging the location and design of buildings to maintain the open natural character of hills and ranges without compromising the landscape and amenity values of prominent hillsides and terraces.
- (h) Strongly discouraging buildings in the Rural Resource Area of the Wooing Tree Overlay Area to ensure a vineyard or treed park-like character with an absence of built form.

**Policy 4.4.10 – Rural Subdivision and Development**



To ensure that the subdivision and use of land in the Rural Resource Area avoids, remedies or mitigates adverse effects on:

- (a) The open space, landscape and natural character amenity values of the rural environment in particular the hills and ranges,
- (b) The natural character and values of the District's wetlands, lakes, rivers and their margins,
- (c) The production and amenity values of neighbouring properties,
- (d) The safety and efficiency of the roading network,
- (e) The loss of soils with special qualities,
- (f) The ecological values of significant indigenous vegetation and significant habitats of indigenous fauna,
- (g) The heritage and cultural values of the District,
- (h) The water quality of the District's surface and groundwater resources, and
- (i) Public access to or along the rivers and lakes of the District, particularly through the use of minimum (and average) allotment sizes.

#### **Policy 4.4.14 Policy- Back country Amenity Values**