Landscape Assessment Report

Robertson Speargrass Farm, Queenstown 31 January 2022



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1. INTRODUCTION

- 1.1. This report provides an assessment of the landscape character and visual amenity effects of a proposed subdivision, the establishment of two new building platforms, associated landscaping and access. The following report includes:
 - A description of the landscape,
 - A description of the proposal,
 - A landscape assessment,
 - Conclusions,
 - Attachments.

2. DESCRIPTION OF THE LANDSCAPE

- 2.1. The site is part of the Wakatipu Basin in the Queenstown Lakes District, Central Otago. It is near the centre of the Wakatipu Basin in an area described in the PDP as the Speargrass Flat Landscape Character Unit 8 (LCU8). LCU8 is a relatively open pastoral unit framed by the south facing slopes of the Wharehuanui Hills to the north and the steep margins of the Slope Hill Foothills to the south. It is a long and narrow LCU bound by these landforms. However, LCU8 opens into a broader flatland at its western extents near the site at Hunter Road and at its eastern extents near Lake Hayes.
- 2.2. LCU8 is covered mainly in pasture grass. Shelterbelt trees extend across parts of the pastoral landscape while mixed scrubland and rural character trees are spread intermittently in the gullies. Some parts of the LCU are clad in woodland. The steeper slopes of the unit are often clad in wilding exotics including hawthorn, conifers and broom. The Speargrass Flats are framed by two landforms to the north and south. The northern landform is a moderate grade and appears as mostly pastoral rolling hills while the southern landform is an escarpment, with steep, often craggy sides.
- 2.3. Speargrass Flat has a mix of rural and rural living characters, with several dwellings set on the flats near Speargrass Flat Road as well as large areas of open space. Other dwellings are set within landform patterns and vegetation near or within natural character elements. Large areas

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of open pastureland, including much of the subject site, provides for an impression of a working rural landscape.

- 2.4. The subject site is the amalgamation of two parcels, legally described as Lot 2 DP 20531 and Lot 1 DP 20531. These sites are split by a legal road and their total combined area (excluding the legal road) is approximately 62.7ha. The site exists east of Hunter Road and north of Speargrass Flat Road. It covers the rolling, northern sides of LCU8 and parts of the flats before intersecting with the Speargrass Flat Road. The Arrow Irrigation Scheme crosses the upper parts of the site, below a large hummock until the water race is piped down the hill slopes, across the flats, under Speargrass Flat Road and then up to the Slope Hill Foothills. The site's south facing slopes are clad mostly in wilding conifers and exotic weeds with some patches of native shrubs. These slopes meet the more pastoral lands at their base, which read as a moderately graded pastoral unit.
- 2.5. A large dwelling exists near the site's north-western corner and is accessed off Hunter Road. There is also an existing shed near the southern central part of the site near Speargrass Flat Road and another small shed adjacent to Hunter Road. A new farm building has recently been approved on the site's southern boundary (RM200892).

3. DESCRIPTION OF THE PROPOSAL

- 3.1. The complete details of the proposal are contained within the Assessment of Environmental Effects which forms part of this proposal. In summary, the proposal seeks to create two new rural living lots, each with a 1000m² BP, a balance parent lot, access and landscaping. The balance of the site willbe held in proposed Lot 1 to facilitate the continued use of this land for productive rural uses and controlling wilding conifer spread.
- 3.2. Proposed Lot 1 will be 66.9ha in area and will contain the existing dwelling near the upper north-western corner of the site and an approved farm building near the site's southern boundary (RM200892). This lot covers most of the site. A portion Lot 1 (25.3 ha) in the northern, rolling, south facing slopes will be controlled for wilding conifers. The balance of the site will be retained in its existing pastoral character.

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- 3.3. Proposed Lot 2 will be 4,000m² in area and set near the south-eastern extents of the site. It will be accessed from Speargrass Flat Road. The proposed BP will be 1000m² in area and surrounded by a residential curtilage area. Future building height will be 5.5m from a set RL across the moderately sloped site. Extensive areas of planting and mounding are proposed.
- 3.4. Proposed Lot 3 will be 4000m² in area and will contain a 1000m² BP surrounded by a residential curtilage area. Any future building will be 5.5m from the flat, existing ground level. Lot 3 will be accessed of a new driveway from Speargrass Flat Road. Extensive mounding and planting are proposed around the BP.
- 3.5. A set of design controls are proposed which will set the tone and character of future buildings and landscape treatments (Appendix A). The objective of these design controls is to ensure built development is visually recessive and of a scale and character which will appears subservient to the landscape's rural and natural values.
- 3.6. The proposed wilding conifer control area will see that area cleared of wilding trees and maintained to ensure wilding conifers do not spread across the site.

4. LANDSCAPE ASSESSMENT

Methodology

4.1. In undertaking this assessment, building poles were erected on each proposed BP to represent the location and building height of future buildings. The profile poles were viewed from key locations along public roads and trails and photographs were taken using a DSLR camera. These photographs are attached to this report (Attachment A and Images 1-14). The effects of the proposal were then considered within the frame of the Proposed District Plan.

Extent of Effect

4.2. In assessing the extent of effects, this report uses the following seven-point scale:

very high, high, moderate-high, moderate, moderate-low, low, very low.

An effects rating of moderate-low corresponds to a 'minor' adverse effects rating. An adverse effects rating of 'low' or 'very low' corresponds to a 'less than minor' adverse effects rating.

- 4.3. This report uses the following definitions:
 - Landscape character and value effects Character (the expression of landscape's collective attributes) and value (the reasons a landscape is valued embodied in its attributes) effects are the consequences of changes in the physical attributes (character), on a landscape's values.¹
 - Visual effects Visual effects are the consequences of change on landscape's values experienced in views.²
 - Landscape "Landscape embodies the relationship between people and place: it is the character of an area, how the area is experienced and perceived, and the meanings associated with it."³

Landscape Category

4.4. In terms of the PDP, the site is shown as being part the Wakatipu Basin Rural Amenity Zone (RAZ) on the Stage 1, 2 and 3 Decisions and Appeal map of the PDP. It is considered that RAZ is the appropriate landscape category of the site.

Statutory Considerations

4.5. It is understood in this part of the district the PDP has largely been confirmed and the application is no longer subject to the provisions in the ODP. The site is within the Wakatipu Basin and subject largely to the matters contained within Chapter 24 of the PDP. This report will provide an assessment of the proposal against the landscape relevant matters contained within Chapter 24 - Wakatipu Basin, including Schedule 24.8 which recognizes the site as being part of the Speargrass Flat Landscape Character Unit 8.

¹ NZILA. Te Tangi a Te Manu Aotearora New Zealand Landscape Assessment Guidelines. April 2021.

² Ibid.

³ Ibid.

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Visibility Overview

- 4.6. Proposed Lot 2 will be located on the south-eastern edge of the property while Lot 3 will be in a different location, near the site's southern boundary. The visibility of proposed Lot 2 will be different to that of Lot 3. However, the surrounding landform restricts views of the site from much of the wider surrounding landscape. The only public places where it may be possible to see the proposed development is from Speargrass Flat Road and Hunter Road.
- 4.7. The proposal seeks extensive landscaping around each proposed BP. This landscaping will provide a high degree of visual screening once trees are mature. The primary visual mitigation will be through the use of landform.
- 4.8. The following description of the extent of visibility describes the potential visibility of buildings and other rural living effects, within 5 years of tree growth. Refer to **Attachment A** and **Images** for each view location.

Speargrass Flat Road

- 4.9. When approaching the site in an east to west direction along Speargrass Flat Road, intervening landform to the east of the subject site will screen all proposed built development until the receptor is approximately 520m from the site (Image 1). Proposed vegetation to the south and east of the proposed BP's will provide a very high level of screening. Only the entrance to Lot 2 will be visible between Images 1 & 3, and from these views all built development will be well screened behind the proposed landscaping.
- 4.10. A receptor in the immediate vicinity of the site (Images 4 & 5) may be able to see the upper parts of a future roof of a building in proposed Lot 2 and 3, but those views will be well buffered by proposed landscaping. This potential view of a future budling's roof may remain until the receptor moves farther west where parts of built development may become visible in Lot 2 (Images 6 9) from a distance of between 450m (Image 6) to 1.1km (Image 9).
- 4.11. Built development in proposed Lot 3 will be well screened from all Speargrass Flat Road views, but the access and landscaping will be visible.

- 4.12. No part of the proposed development will be visible from the Speargrass Road corridor west of the Hunter Road intersection.
- 4.13. Overall, there will be some limited potential visibility of a future roof in the BP on Lot 2 for an approximately 500m long portion of Speargrass Flat Road between Images 4 6. Visibility of built development on Lot 2 will become more apparent from receptors farther west along Speargrass Flat Road (Images 8 & 9) but built development within Lot 3 will be well screened by proposed landscaping.

Hunter Road

- 4.14. Hunter Road crosses the Speargrass Flats in a north south direction. South of Speargrass Flat, the road is called Lower Shotover Road and the proposed development will not be visible south of this intersection.
- 4.15. There may be some limited visibility of built development in proposed Lot 2 from near the southern extents of Hunter Road intersection (Image 11) from a distance of approximately 1.2 km. This level of visibility will continue as the receptor moves to the north, where future built development on Lots 2 and 3 will be visible for a short portion of the road (Images 12 13). As the receptor moves farther north, the proposed lots will be screened by landform, north of Image 14.
- 4.16. Overall, there will be some limited, distant views of the proposed development for an approximately 500m long portion of Hunter Road between **Images 11 & 14**.

Private Places

- 4.17. In terms of private places, there is potential for the proposed development to be visible from the neighbouring property's south of Speargrass Flat Road. However, views of built development will largely be screened by proposed landscaping.
- 4.18. East of the subject site is a large rural site and views from this site will be similar to and to a lesser extent than those experienced from Hunter Road. West of the subject site, views will be well screened as those described above for **Images 1- 3**. Most of the dwellings adjacent to the site's north boundary are set back sufficiently from the edge of the landform to restrict visibility

of the proposed development. Buildings and approved building platforms south and east of the proposed development area will not see built development as intervening landform and proposed landscaping will screen the building areas.

21.21. Proposed District Plan – Chapter 24 – Wakatipu Basin

4.19. The matters under the relevant PDP Assessment Matters in Chapter 24.7 are considered below.

Summary of Assessment Matters - PDP 24.7 - Wakatipu Basin

24.7.5 New buildings (and alterations to existing buildings) including farm buildings and residential flats, and infringements of the standards for building coverage, building size, building material and colours, and building height: Landscape character

> a. The extent to which the building, ancillary elements and landscaping responds to the identified values set out in Schedule 24.8 – Landscape Character Units for the relevant landscape unit, and the following assessment matters.

i. building height;

ii. building colours and materials;

iii. building coverage;

iv. design, size and location of accessory buildings;

v. the design and location of landform modification, retaining, fencing, gates, vehicle access (including paving materials), external lighting, domestic infrastructure (including water tanks);

vi. the retention of existing vegetation and landform patterns, and proposed new planting;

vii. earth mounding and framework planting to integrate buildings and vehicle access;

viii. planting of appropriate species that are suited to the general area including riparian restoration planting;

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ix. the retirement of steep slopes over 15° and restoration planting to promote slope stabilisation and indigenous vegetation enhancement; and x. the integration of existing and provision for new public walkways and cycleways/bridlepaths.

- 4.20. With respect to the landscape character values as set out in Schedule 24.8 of the PDP for LCU8, Speargrass Flat, the proposal responds to the landscape's characteristics in the following ways:
 - a) Landform patterns The landform will be modified slightly to accommodate the mounds and set Lot 2's BP into the landscape. However, the overall landform patterns of LCU8 will be unaffected by the proposal.
 - b) Vegetation patterns Exotic pasture grasses and shelterbelts will remain dominant.
 - c) Hydrology Watercourses will be unaffected.
 - d) Proximity to ONL/ONF Open, long-range views to the ONLs and ONFs will be maintained.
 - e) Land use The pastoral land use over the visually prominent parts of the site will not be affected by the proposal and the proposal will reflect the existing 'scattered rural residential lots' of the landscape.
 - f) Settlement patterns The proposed BPs will be framed by plantings and Lot 2 will be set into landform. The proposed BP will be buffered from other rural areas, large areas of open space and vegetation.
 - g) Proximity to key route The proposed BPs will be located away from key vehicular routes.
 - h) Heritage features No heritage features will be affected by the proposal.
 - i) Recreation features The proposal will not have any effect on existing recreation features.
 - j) Visibility/prominence The proposed BPs and activity will not be prominent from public places.
 - k) Views The proposal will not adversely affect any key views.
 - Complexity The proposal will not adversely affect the hillslopes and instead will embrace the complexity and 'edge effect' to locate built development where it can best be absorbed.
 - m) Coherence The balance of the LCU will continue to display a coherent open pastoral character.
 - Naturalness The LCU's hillslopes and riparian areas will not be affected by the proposal to a more than very low degree.

- o) Sense of place The site's open pastoral character will continue to read as a 'breathing space' between development to the north and south of the LCU. The wider LCU will be unaffected by the proposal.
- p) Potential landscape issues and constraints associated with additional development There are no potential landscape issues or constraints associated with the proposal. The wider open character of the LCU will not be adversely affected by the proposal.
- q) Environmental characteristics and visual amenity values to be maintained and enhanced The proposed development will be integrated into landform and vegetation and the surrounding sense of openness and spaciousness will remain.
- r) Capability to absorb additional development The BPs will be located in the least sensitive parts of the site where the edge effect, landform, proposed vegetation and the large area of open space (which is part of the larger site) will allow the proposed development to be absorbed without adversely affecting landscape character or visual amenity.
- 4.21. The proposed development will be well controlled by the building and landscape design controls which will limit the height, form and external appearance of a future building, lighting and landscaping. The BPs will be well contained within appropriate vegetation and mounding. It is considered the proposal will adversely affect the existing landscape character of LCU8 to a no more than low degree.

b. The extent to which existing covenants or consent notice conditions need to be retained or are otherwise integrated into the conditions governing the proposed development.

4.22. There are no existing covenants or consent notice conditions which need to be retained or integrated into the proposed development. It is understood the balance of the land will continue to operate as a working farm.

c. The extent to which the development maintains visual amenity in the landscape, particularly from public places.

4.23. The proposal, if seen at all will be seen as part of a large, visually accessible open landscape. Building will be set at the edges of this more open landscape and the visual amenity of the site's

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openness and views across it will largely be maintained. It is considered that the visual amenity as experienced from public and private places will be adversely affected to a low degree.

d. In the case of multiple buildings or residential units not otherwise addressed as part of a previous subdivision, the extent to which a sense of spaciousness is maintained, and whether the buildings are integrated with existing landform, vegetation or settlement patterns.

4.24. The proposal will result in the establishment of two BPs in different parts of the site, both nestled within landscaped mounding and rural amenity planting consistent with patterns seen in the LCU. Lot 2's BP will be at the south-eastern edge of the site where landforms converge, providing higher ability to absorb change by acting as a transitional space. The proposed BP on proposed Lot 3 will be near an existing shed at a bend in the road where again, the transition character of that space increases the landscape's ability to absorb change. The proposal will maintain a sense of openness and spaciousness across the balance of the site and landscape and will integrate development with existing landform, vegetation and cadastral patterns.

e. Where a residential flat is not located adjacent to the residential unit, the extent to which this could give rise to sprawl of buildings and cumulative effects

4.25. This assessment matter is not applicable to the proposal.

f. Where the site adjoins an ONF or ONL, the extent to which the development affects the values of that ONF or ONL.

4.26. This assessment matter is not relevant as there are no adjacent ONLs or ONFs.

g. Whether mitigation elements such as a landscape management plan or proposed plantings should be subject to bonds or covenants.

4.27. No bonds or covenants are proposed but all landscaping will be undertaken and protected by consent conditions.

h. The merit of the removal of wilding exotic trees at the time of development.

4.28. The proposal seeks to implement a wilding conifer control area over the site's south facing slopes. This will see the removal of all wilding trees and the ongoing control of wilding trees

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across this slope. This is considered a significant part of the proposal as the removal of the existing wilding conifers will result in positive outcomes in terms of nature conservation and amenity values. Similarly, the removal of these wilding trees and control of the slope for woody weeds and other wilding trees will enhance the legibility and formative process of the landscape by better exposing the underling landform. While the proposed wilding conifer control area offers positive effects in terms of landscape enhancement, the proposal is not reliant on this component to ensure the development is appropriately remedied or mitigated.

> i. Whether the proposed development provides an opportunity to maintain landscape character and visual amenity through the registration of covenants requiring open space to be maintained.

4.29. No covenants are proposed.

5. CONCLUSION

5.1. The proposal seeks to create two new lots, each with a 1000m² building platform, access and associated landscaping. Mounding and planting will contain the proposed development and provide a high degree of screening such that the visual effects of development will be no more than low. The large parent lot will be retained in its existing open, pastoral character and development will be set at the edge of this open space, allowing for continued, public and private views across an open pastoral landscape. Overall, it is considered the proposal will result in no more than low adverse effects on landscape character and visual amenity.

Stephen Skelton

Registered Landscape Architect

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Proposed Design Controls

January 2022

1. Building Footprint

- All residential buildings and accessory buildings shall be constructed within the approved building area.
- The maximum building coverage within the building area shall be 500m².

2. Building Height

• Building height is limited to no greater than 5.5m as measured from RL 368.5masl for Lot 2 and 5.5m for Existing Ground Level for Lot 3. This excludes chimneys which may extend 1.5m above the highest roof point.

3. Exterior Cladding

- All exterior cladding shall be limited to:
 - Cedar weatherboard (stained, oiled, weathered);
 - Cedar board and batten;
 - Shingles / shakes;
 - Locally sourced schist stone/plaster mix (up to 60% plaster cover);
 - In-situ concrete/rammed earth walls;
 - Pre-weathered (patina) copper sheet cladding or weathered metal finishes (to read as subservient and secondary building materials only);
- Any colours shall be of a recessive natural colour in tones of natural browns, greys or greens with a light reflectance value (LRV) of less than 30% (if a LRV is applicable for the material).

4. Roofing Material

- Roof claddings shall be in steel (corrugated or tray), slate (natural or imitation), shingles/shakes, membrane linings and/or vegetated.
- Any colours shall be of a recessive natural colour in tones of dark browns, black, greys or greens with a light reflectance value (LRV) of less than 20% (if a LRV is applicable for the material).
- Conservatory style glazed roofing is permitted up to a maximum 20% of covered roof area.

5. Roof Details and Structures Attached

• All roofing details including gutters, downpipes and flashings shall match the joinery/roof or wall materials and colours.

- All structures attached to the roof, including aerials, dishes or solar panels, shall be discretely located such that they are not visible from Speargrass Flat Road.
- All metal chimney flues shall be enclosed or in a recessive colour to match the surrounding roof colour.

6. <u>Windows/Glazing and Doors (Façade Articulation)</u>

- Windows and doors should be recessed from the façade by a minimum of 200mm or designed to avoid the flat elevation look of aluminium joinery.
- Exterior joinery shall be in timber, steel or aluminium. Joinery colours (excepting timbers) shall match roofing detail colours.

7. Gates and Fencing

- All boundary and curtilage fencing shall be constructed to a maximum height of 1.2 metres of standard un-painted timber post and wire (in the local traditional farming style), standard un-painted timber post and beam, or dry stacked locally sourced schist stone with vertical capping in the agricultural stone wall style only.
- Entry gates shall not exceed 1.2m in height and shall be constructed of timber (excluding fittings, fixings and hinges).

8. <u>Exterior Lighting</u>

- All exterior lighting (including that fixed to a building) shall be housed and directed downward. All exterior lighting fixed to a dwelling shall be fixed no higher than 1.5m above finished ground level.
- Low intensity, indirect light sources are to be used for all exterior lighting applications.
- External light sources are to be incandescent, halogen or other white light, not sodium vapour or other light.
- No exterior lighting is to be installed outside of the curtilage area and driveway.

9. Curtilage Area and Services

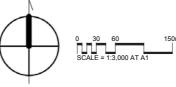
- All elements of domestic curtilage (such as car parking areas, lawns, domestic landscape planting, outdoor storage areas, water tanks, gas cylinders, rubbish bins and clotheslines) shall be contained within the identified curtilage area and building area and must be screened from view from Arrowtown-Lake Hayes Road.
- Screening structures must adhere to the relevant building design controls.
- Water tanks shall be in a recessive natural colour in tones of natural browns, black, greys or greens and may be located outside the building area provided part is within 5m of the curtilage area. Water tanks shall be screened from public views by landform or vegetation.
- All other services and utilities shall be located below ground.





Reference: PA20412 IS03

Scale: 1:3,000@A1 - 1:6,000@A3



Attachment A



25mm photo - 21 January 2022 at 4:14pm



Reference: PA20412 IS03



50mm photo - 21 January 2022 at 4:15pm



Reference: PA20412 IS03



50mm photo - 21 January 2022 at 4:15pm



Reference: PA20412 IS03

Image 3



50mm - 21 January 2022 at 4:17pm



Reference: PA20412 IS03



50mm photo - 21 January 2022 at 4:19pm



Reference: PA20412 IS03

Image 4 - Lot 3



25mm photo - 21 January 2022 at 4:19pm



Reference: PA20412 IS03

Image 5 - **Lot 2**



50mm photo - 21 January 2022 at 4:20pm



Reference: PA20412 IS03



50mm photo - 21 January 2022 at 4:21pm



Reference: PA20412 IS03

Image 6 - Lot 2



50mm photo - 21 January 2022 at 4:21pm



Reference: PA20412 IS03

Image 6 - Lot 3



50mm photo - 21 January 2022 at 4:22pm



Reference: PA20412 IS03

Image 7 - **Lot 2**



25mm photo - 21 January 2022 at 4:22pm



Reference: PA20412 IS03

Image 7 - **Lot 3**



50mm photo - 21 January 2022 at 4:23pm



Reference: PA20412 IS03

Image 8



50mm photo - 21 January 2022 at 4:25pm



Reference: PA20412 IS03





50mm photo - 21 January 2022 at 4:10pm



Reference: PA20412 IS03



50mm photo - 21 January 2022 at 4:08pm



Reference: PA20412 IS03



50mm photo - 21 January 2022 at 4:29pm



Reference: PA20412 IS03

Image 12



25mm photo - 21 January 2022 at 4:29pm



Reference: PA20412 IS03



50mm photo - 21 January 2022 at 4:28pm



Reference: PA20412 IS03

SERVICES ASSESSMENT REPORT

D. ROBERTSON & J. HUNT PROPOSED SUBDIVISION SPEARGRASS FLAT, QUEENSTOWN April 2021



CLARK FORTUNE MCDONALD & ASSOCIATES REGISTERED LAND SURVEYORS, LAND DEVELOPMENT & PLANNING CONSULTANTS

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1 INTRODUCTION

Clark Fortune McDonald & Associates (CFM) has been engaged by D. Robertson & J. Hunt to assess servicing options for a proposed residential subdivision on Speargrass Flat Road, Queenstown.

The proposal seeks to establish 3 new allotments with residential building platforms.

The site is legally described as Lot 1-2 DP 20531 and Sec 1-3 SO 20437 held in Record of Title OT12A/419 and comprises 63.98 hectares more or less.

The property is accessed from Hunter and Speargrass Flat Roads and contains an existing residence. The property is used for agricultural activities and has been the home of the Wakatipu Pony Club for over 30 years.

This report is preliminary for the purposes of resource consent only. Further information and detailed engineering design will be required if development proceeds.

2 SCOPE OF WORK

The scope of work includes examination of existing reports for the subject property and asbuilt records, confirmation of capacity of existing services to determine the adequacy of the existing infrastructure, and recommendation of infrastructure servicing options.

3 DESIGN STANDARDS & REPORTS

Site development standards include, but are not limited to, the following:

- QLDC Land Development and Subdivision Code of Practice adopted 8/10/2020.
- NZS4404:2010
- Drinking-Water Standards for New Zealand 2005.
- NZS PAS 4509:2008, New Zealand Fire Service Fire-fighting Water Supplies Code of Practice.
- Water for Otago, Otago Regional Council regional water plan.
- Document for New Zealand Building Code Surface Water Clause E1 / Verification Method 1.
- On-site domestic wastewater management AS/NZS 1547:2012

4 ACCESS

Proposed Lot 1 contains the existing residence which accesses from Hunter Road. No changes to this activity are proposed as a result of the subdivision.

Proposed Lots 2 & 3 are to access onto Speagrass Flat Road at the eastern end of the subject site. There is an existing formed farm crossing onto the road. Speargrass Flat Road has a posted speed limit of 80km/hr. The crossing location has sight distances in each direction that exceed the minimum requirements of 115m.

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The crossing would be upgraded to a standard required by Code of Practice refer QLDC standard drawing B5-20 with a 6m width up to the boundary.

The crossing would be shared by lots 2 & 3 and split into two separate driveways once inside the property. A Right of Way easement would be created for the small section of shared access.

Likewise, proposed Lot 4 is to access onto Speargrass Flat Road. Again, it is proposed to utilise an existing farm crossing that would be upgraded to meet Code of Practice requirements per standard drawing B5-20. In this instance a formed width at the boundary of 3.0m would be sufficient for a single dwelling.

There is currently two farm crossings either side of an existing shed. The eastern crossing is proposed to be used to provide some separation from the vehicle crossing servicing 226 Speargrass Flat road on the south side. The western crossing would be removed.

The proposed crossing location has sight distances exceeding the minimum required distances of 115m in both directions.

5 WASTEWATER

An Onsite Wastewater Disposal Site Soils Assessment has been undertaken by Grant Railton of Railton Contracting and Drainage ltd. This assessment is attached to the application.

The assessment concludes that onsite wastewater is feasible and recommends that standard secondary treatment plants can be used.

5.1 Existing reticulation

The property is located outside the QLDC reticulation scheme boundaries and as such there is no Council owned wastewater assets in the immediate area. The nearest QLDC sewer reticulation is the Lake Hayes Scheme. From the eastern boundary of the site to the closest gravity manhole is approx. 2.2km distant.

Given the level of engineering required to connect 3 dwellings, and the size of the subject property and the land available for onsite disposal, connecting to existing infrastructure that has not designed for the demand for this site is not considered to be the most efficient option.

5.2 Proposed residential demand

The proposed allotments are intended to accommodate a standard residential dwelling. Under QLDC COP residential demand would be 250 litres per person per day based on 3 people per dwelling. Total daily demand would therefore be 2,250l/day.

5.3 On Site Wastewater Disposal

Australian/New Zealand Standard 1547:2012 was published superseding the previous standard from 2000. The standard was updated to reflect a risk-management approach to wastewater treatment. It is noted however that much of the methodology is unchanged from the earlier standard.

The geology and geotechnical conditions of the site and assessment of hydrogeology and sensitive receivers of the site completed by Geosolve in their report are of October 2020 (ref 200537) are applicable and have been adopted for this report.

5.4 Conclusion and recommendations

Based on the Geosolve investigations and the Railton assessment it is concluded that onsite wastewater disposal is the most feasible method of disposing of wastewater generated from the proposed subdivision.

Detailed design is required to be completed as part of the Building Consent process. The new standard requires a robust design process. The necessary guidance and comprehensive application forms are available on QLDC website.

https://www.qldc.govt.nz/planning/building-consents/application-forms/onsite-wastewater-disposalsystems/

Provided the correct design, approval, construction and monitoring processes are followed for the establishment and operation of the wastewater disposal system there will be no adverse effects arising from the disposal of wastewater to ground from any future dwellings.

6 STORMWATER

6.1 Existing Stormwater Infrastructure

There is currently no reticulated stormwater infrastructure servicing the site.

The subject site geology is described in the Geosolve report.

6.2 Stormwater Catchments

The site is located on a valley floor between the Wharehuanui hills to the north and the Slopehill foothills to the south.

The lower part of the site forms a shallow basin where occasional ponding occurs.

ORC catchment planning shows that the larger catchment area falls generally to the south west towards the Shotover River. Below is an image showing the Lake Hayes Catchment.

The eastern edge of the site is close the saddle of the valley where Speargrass Flat then falls to the east to Mill Stream.

5

The western boundary of the property adjoining Hunter Road is the catchment boundary and an existing scruffy dome and sumps dispose of stormwater to ground from land to the west.

Much of the run-off from the hills to the south is intercepted by Speargrass Flat Road, there are three existing culverts that convey water across Speargrass Road from the hill side catchment.

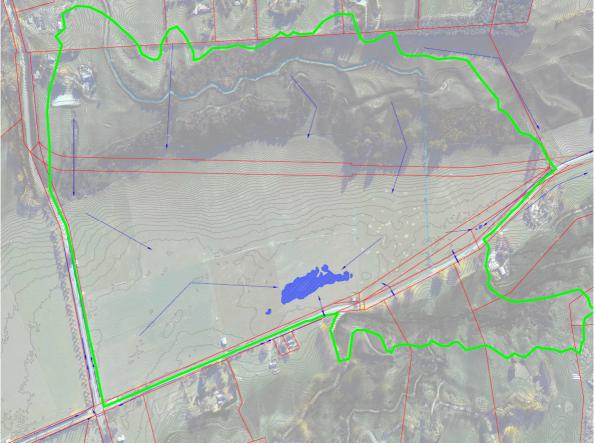
Below is a catchment diagram, the green line being the catchment extents which measures approx. 75ha.

The bottom of the basin (RL 367.50m) is indicated in the dark blue hatching. Flow arrows and culverts are also shown in blue. The contour interval is 0.5m.

It is noted that the Arrow Irrigation race also bisects part of the catchment and acts as a cut off drain. This feature may not act as a cut off as the race may be piped in future allowing run-off to return to pre-development flows. It is also noted the race is not specifically designed to take storm water flows and in extreme events could overtop or breach.

Should this occur, lots 2 & 3 are located east of the race and are therefore not susceptible to overflow from a breach.

Lot 4 is situated on the opposite of the basin so flows would be arrested at the invert of the basin and is therefore not in a flow path.



Catchment diagram (enlargement in appendix)

6



Lake Hayes Catchment

Proposed Lot 4 is situated closest to the basin or area of ponding. The existing ground level at the building site is at RL 368.00m or 0.5m above the lowest part of the site. It is recommended that any proposed building is located above this level to ensure no stormwater nuisance is experienced. It is noted that Building Code requires finished floor level to be a further 225mm above existing ground level as a further protection against stormwater.

The dwelling proposed on Lot 2 has an existing ground level of 369.00m so has an additional 0.5m freeboard and is generally upslope from the basin area.

Lot 3 is situated on a gently sloping area varying from RL 371.00m to RL 373.50m.

4.3.5 Design criteria

For a future dwelling, stormwater design would be completed in accordance with NZ Building Code E1 – Surface water and/or section 4 of QLDC COP 2018.

Stormwater run-off from new impervious areas would be disposed to ground. The design shall be undertaken in accordance with Verified Method E1/VM1 and/or QLDC COP. This would take the form of a soakpit or similar on-site storage/soakage system. Given the size, geology and topography of the subject site, location and size of soakage areas are not constrained allowing for flexibility of design options.

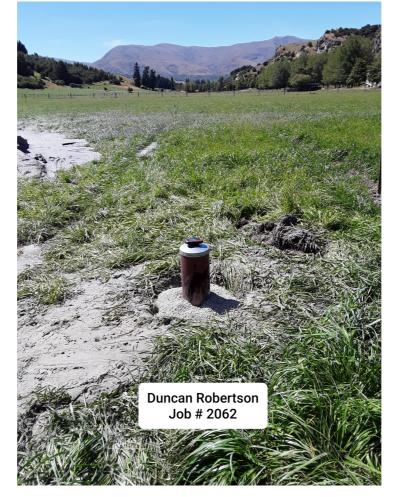
Secondary overflow will be to the paddocks where the existing basins are located.

Detailed design is required to be supplied with the building consent documentation and shall be completed by a suitably qualified person.

7 WATER SUPPLY

7.1 Existing Infrastructure

A new 150mmØ bore was constructed within the property by Southdrill in February 2021.



The bore log is attached to the appendix of this report. The total bore depth is 32.61m and water was encountered at 7.21m below the top of the casing. The bore was test pumped for 3 hours at 1.66 litres/sec (~18,000l) and the drawdown was 4.32m.

Samples of the water were sent for chemical and bacteriological analysis and results show that the water meets the New Zealand Drinking Water standards. A copy of the test results is included in the appendix.

8

The nearest QLDC municipal water supply system would be the Lake Hayes Scheme. It is approx. 1.16km distant to the east where a 150mmØ main terminates in front of 376 Speargrass Flat Road.

The Arrow Irrigation Company network runs through the site. There is an open race coming in from the north and heading east until the water enters and travels through the Speargrass syphon in a southerly direction.

7.2 Water supply design

The preferred option is to service the new sites with the on-site bore.

The new bore has been developed with screen and sump. A submersible pump would be installed which could fill a header or control tank to be situated on site. The tanks could then supply the domestic and irrigation demand of the future dwellings via gravity reticulation network. Alternatively, a pressure vessel could be located near the bore head that would control the pump. The pump would drive the water to tanks on each of the proposed allotments where tanks fitted with ballcocks would be filled. Once the ballcocks switch off, the pump would fill the pressure vessel. As water is drawn off the system into any of the tanks, pressure in the vessel would drop, re-starting the pump. Pump would stop once pressure vessel with set pressure point was reached. The preferred operational philosophy and set up can be determined at detailed design.

The proposed residential dwellings on each of the new allotments is expected to have the following domestic water demands.

Residential water demand has been determined from QLDC COP: 6.3.5.6 (a) Minimum Water Demand daily consumption: 700 I / person / day; occupancy = 3 peak factor: 4.0

Number of residential units: 3 average daily demand; 6,300 I / day; peak hour flow; 0.3 I / second.

The bore was test pumped at 1.66l/sec with a nominal drawdown after 3 hours. The bore therefore can easily meet the proposed peak demand.

With appropriate pump selection the bore can supply water to meet the peak demand so a buffer is not necessary. However, for security of supply (in the event of a power outage or pump failure) it is recommended that a domestic buffer and emergency storage be kept on each new site in a tank. A minimum of 10,000l of storage would be considered sufficient for this purpose.

Connection to QLDC scheme is feasible, however given the distance to connect is reasonably high for the 3 proposed lots, this option is likely to be eliminated due to cost. It

would also require assessment of capacity of the Lake Hayes scheme and further approvals from QLDC Property and Infrastructure for installing a watermain in Speargrass Flat Road. Therefore, this option is considered less desirable for this proposal. The cost benefit may change in time depending on future development in the catchment as a result of re-zonings or changes to water supply legislation.

If it were considered desirable and cost effective, another option to reduce demand from the bore would be to supply irrigation water to the proposed allotments from the Arrow Irrigation scheme. This would be subject to supply agreement from the irrigation company. At this time, this option is not required so has not been investigated further.

7.3 Required Firefighting demand

Firefighting for the proposed dwellings will need to meet the requirements of SNZ PAS 4509 – 2008 NZ Fire Service Firefighting Water Supplies Code of Practice.

In this instance the preferred solution would be to cater for the firefighting in a storage tank(s) on site. The tanks will need to be arranged as per appendix B of the standard. Minimum static reserve to be kept at all times to be 45,000l. This can be held in the same tanks as the domestic storage or kept in separate tanks as required.

The tanks would need an approved firefighting coupling. This would be located at a suitable hardstanding area for fire appliance access no closer than 6m to the fire hazard.

For lots 2 & 3, given their compact arrangement, fire tanks could be shared to avoid an unnecessary duplication of storage. Given the distance to Lot 4 however it would likely be more cost effective to provide tanks as opposed to running reticulation suitable for conveying firefighting flows from storage elsewhere on site. The value engineering detail will be determined at a later stage.

One further option available to reduce fire water storage would be to install sprinklers in the proposed dwellings.

8 POWER, TELECOMMUNICATIONS

There is existing 11KvA overhead electricity network adjoining the boundary of the property that runs within the road reserve. There are two existing pole mount transformers nearby that may be suitable as shown in the Aurora GIS screen shot below.



Aurora GIS screenshot.

It is anticipated that this can supply the proposed dwelling. Confirmation from the network owner that supply is available is attached. If necessary, depending on the electrical demand for the dwelling a minor upgrade to the transformer may be necessary or new pole mount transformers could in installed on any of the poles adjoining the property. From the network connection point all new internal reticulation the allotments will be underground.

Telecommunications services exist at the boundary of the property within both Speargrass Flat and Hunter Roads.

At the intersection of these roads is an existing telecommunication distribution cabinet.



11

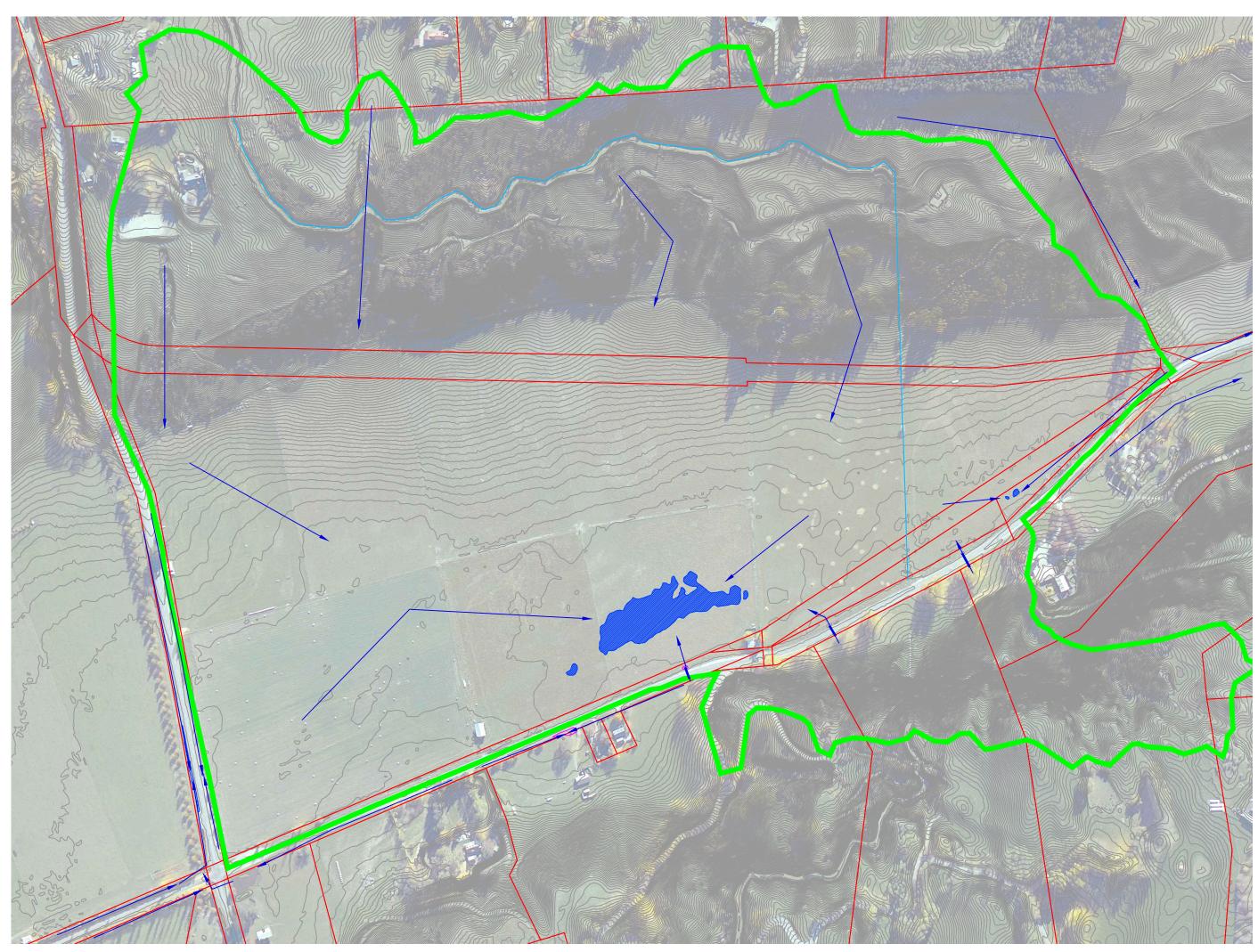
It is anticipated that should telecommunications for the new lots be needed a copper cable connection at a minimum can be trenched in to the proposed boundaries from the existing reticulation.

Attached is an offer of service from the network owner confirming supply availability.

All new infrastructure shall be installed underground. All necessary services will be extended to service the proposed allotments.

It is not anticipated that there will be any supply or capacity issues for these services and connection will be made available from existing infrastructure.

9 APPENDICES



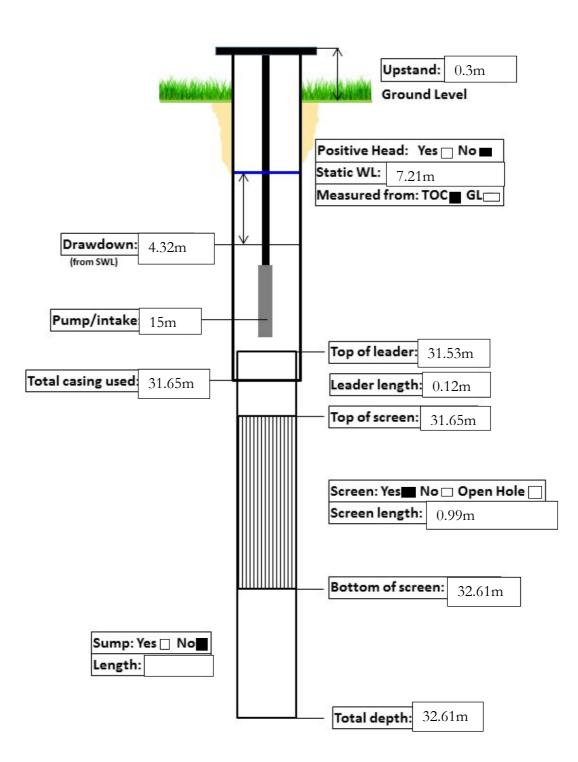
Document Set ID: 7207820 Version: 1, Version Date: 12/04/2022

Bore Construction Report



OFFICE USE ONLY						
Date received Accession number Signed						
Bore number	Entered IRIS date	Invoice date				

					GE	NERAI	L DETA	LS									
Client/Consent holders name	Duncan	Robert	son							Con	sent n	umbei	· RM20.	417			
Location/Address	Speargrass Flat Road, Queenstown																
Grid reference	E126615	6154 N5012050			050		GPS			Other			Cell #				
Sketch plan attached	Yes 🗌	No			Pho	tos	Yes			No			Home #				
					DR	ILLING	G DETA	LS									
Drilling company	SouthDr	ill LTD						D	riller	Rolly	Harre	х					
Machine/Rig	Foremos	t DR24	1						Fleet	2020							
Drill method	Tubex																
				BOF	RE CO	NSTRL	JCTION	DETAIL			<u> </u>						
Start date	17/02/2	021				r		Finish			2/2023	L					
Bore diameter	150mm					mm	Ca	sing mat	terial	Steel							
Screen material	Stainless	Steel			-												
Screen diameter	Inside				mm						Outs	ide				mm	
Screen slots					mm						Sum	p diam	eter			mm	
Overdrilled	Yes		No														
							ATER D										
Dry bore	Yes 🗌	No		If dry, v	was ca		trieved			No		Bore	filled in	Yes		No	
Development period	4			hours			Develop	ment me	thod	Air							
Yield/Test pumping	Airlifted				Pu	mped				Test	pump	period		3 H	lours		
Test pump rate	1.66		litres	/second		Meth	od of m	easuring	rate	Volu	metric	Test					
Comments																	
Pumped water level	11.53m			metres													
	•				WAT	FER QU	UALITY	ETC									
Bacterial water test	Yes	No									Chen	nical w	ater Test	Yes		No	
Casing top sealed	Yes	No								Impe	ervious	s seal a	t ground	Yes		No	
			BOR	E LOG (I	METR	ES BEI	LOW RE	FERENC	E PO	INT)							
0.0m – 0.8m Top Soil																	
0.8m – 8.5m Silty gravels																	
8.5m – 21.5m Silt																	
21.5m – 28.8m sand and qu	arte grite																
-	-																
28.8m – 32.1m Sandy grave	I																
32.1m – 35.7m Sand																	
Do you intend to drill more here	oc under th	vic 1	d 1 ! = -	Correct	+ m		V-			No							
Do you intend to drill more bord							Y€ vrac drill			No L		hore	loge provi	had			
If yes, number of bores drilled			of			во	res drille	:0		N	umbel	bore	logs provid	.ea			
														РТО	for bo	ore dia	gram



Hill Laboratories Limited 28 Duke Street Frankton 3204 Private Bag 3205 Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22)

Page 1 of 4

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E mail@hill-labs.co.nz

W www.hill-laboratories.com

Certificate of Analysis

Olionat	Cauth Drill Lingita d	1 - L NI-	0500700	
Client:	SouthDrill Limited	Lab No:	2533789	DWAPv1
Contact:	SouthDrill Limited	Date Received:	20-Feb-2021	
	C/- SouthRoads Limited	Date Reported:	26-Feb-2021	
	PO Box 968	Quote No:	102422	
	Invercargill 9840	Order No:	SOU 2062	
		Client Reference:	Duncan Robertson	
		Add. Client Ref:	Job#2062	
		Submitted By:	SouthDrill Limited	

Sample Type: Aqueous

Cample Type. Aqueous					
	Sample Name:	Duncan Robertson 19-Feb-2021 2:00 pm	Guideline	Maximum	
	Lab Number:	2533789.1	Value	Acceptable Values (MAV)	
Individual Tests				,	
Total Cadmium	g/m³	< 0.000053	-	0.004	
Total Chromium	g/m³	< 0.00053	-	0.05	
Fluoride	g/m³	0.09	-	1.5	
Routine Water + E.coli profile	Kit				
Escherichia coli	MPN / 100mL	<1	-	< 1	
Routine Water Profile					
Turbidity	NTU	2.4	< 2.5	-	
pН	pH Units	8.1	7.0 - 8.5	-	
Total Alkalinity	g/m ³ as CaCO ₃	152	-	-	
Free Carbon Dioxide	g/m³ at 25°C	2.6	-	-	
Total Hardness	g/m ³ as CaCO ₃	159	< 200	-	
Electrical Conductivity (EC)	mS/m	33.3	-	-	
Electrical Conductivity (EC)	µS/cm	333	-	-	
Approx Total Dissolved Salts	g/m³	220	< 1000	-	
Total Arsenic	g/m³	0.0030	-	0.01	
Total Boron	g/m³	0.0056	-	1.4	
Total Calcium	g/m³	57	-	-	
Total Copper	g/m³	< 0.00053	< 1	2	
Total Iron	g/m³	0.27	< 0.2	-	
Total Lead	g/m³	0.00120	-	0.01	
Total Magnesium	g/m³	4.2	-	-	
Total Manganese	g/m³	0.068	< 0.04 (Staining) < 0.10 (Taste)	0.4	
Total Potassium	g/m³	2.8	-	-	
Total Sodium	g/m³	5.6	< 200	-	
Total Zinc	g/m³	< 0.0011	< 1.5	-	
Chloride	g/m³	1.9	< 250	-	
Nitrate-N	g/m³	0.18	-	11.3	
Sulphate	g/m³	17.0	-		

Note: The Guideline Values and Maximum Acceptable Values (MAV) are taken from the publication 'Drinking-water Standards for New Zealand 2005 (Revised 2018)', Ministry of Health. Copies of this publication are available from https://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2018

The Maximum Acceptable Values (MAVs) have been defined by the Ministry of Health for parameters of health significance and should not be exceeded. The Guideline Values are the limits for aesthetic determinands that, if exceeded, may render the water unattractive to consumers.

Note that the units g/m³ are the same as mg/L and ppm.



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

pH/Alkalinity and Corrosiveness Assessment

The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders.

The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (25 g/m³) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

The pH of this water is within the NZ Drinking Water Guidelines, the ideal range being 7.0 to 8.0. With the pH and alkalinity levels found, it is unlikely this water will be corrosive towards metal piping and fixtures. The high alkalinity of this water may cause an increase in the pH in the root zones of plants which are irrigated using this water.

Hardness/Total Dissolved Salts Assessment

The water contains a low amount of dissolved solids and would be regarded as being hard. There will be difficulty in forming a lather with soap, and a 'scum' will form in baths, showers, etc.

Nitrate Assessment

Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable. The Drinking-water Standards for New Zealand 2005 (Revised 2018) suggests a maximum permissible level of 11.3 g/m³ as Nitrate-nitrogen (50 g/m³ as Nitrate).

Nitrate-nitrogen was detected in this water but at such a low level to not be of concern.

Boron Assessment

Boron may be present in natural waters and if present at high concentrations can be toxic to plants. Boron was found at a low level in this water but would not give any cause for concern.

Metals Assessment

Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 g/m³, may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Iron was found in this water at a low level.

Manganese was found in this water at a significant level.

Treatment to remove iron and/or manganese may be required.

Bacteriological Tests

The NZ Drinking Water Standards state that there should be no Escherichia coli (E coli) in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present. Results obtained for Total Coliforms are only significant if the sample has not also been tested for E coli.

Escherichia coli was not detected in this sample.

Final Assessment

The parameters Total Iron and Total Manganese did NOT meet the guidelines laid down in the publication 'Drinking-water Standards for New Zealand 2005 (Revised 2018)' published by the Ministry of Health for water which is suitable for drinking purposes.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Routine Water Profile		-	1
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter. Performed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) 23rd ed. 2017.	-	1
Turbidity	Analysis using a Hach 2100 Turbidity meter. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 2130 B 23 rd ed. 2017 (modified).	0.05 NTU	1
рН	pH meter. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 4500-H ⁺ B 23 rd ed. 2017. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	1
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 2320 B (modified for Alkalinity <20) 23 rd ed. 2017.	1.0 g/m³ as CaCO ₃	1
Free Carbon Dioxide	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO ₂ D 23^{rd} ed. 2017.	1.0 g/m³ at 25°C	1
Total Hardness	Calculation from Calcium and Magnesium. APHA 2340 B 23 rd ed. 2017.	1.0 g/m ³ as CaCO ₃	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 2510 B 23 rd ed. 2017.	0.1 mS/m	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 23rd ed. 2017.	1 µS/cm	1
Approx Total Dissolved Salts	Calculation: from Electrical Conductivity.	2 g/m ³	1
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.0011 g/m ³	1
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.0053 g/m ³	1
Total Cadmium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.000053 g/m ³	1
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.053 g/m ³	1
Total Chromium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.00053 g/m ³	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.00053 g/m ³	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.021 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.00011 g/m ³	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.021 g/m ³	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.00053 g/m ³	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.053 g/m ³	1
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.021 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.0011 g/m ³	1
Chloride	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 rd ed. 2017.	0.5 g/m ³	1
Fluoride	Direct measurement, ion selective electrode. APHA 4500-F ⁻ C 23 rd ed. 2017.	0.05 g/m ³	1
Nitrate-N	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 rd ed. 2017.	0.05 g/m ³	1
Sulphate	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 rd ed. 2017.	0.5 g/m ³	1

Sample Type: Aqueous								
Test	Method Description	Default Detection Limit	Sample No					
Escherichia coli	MPN count using Colilert (Incubated at 35°C for 24 hours) and 97 wells. Analysed at Hill Laboratories - Microbiology; 101c Waterloo Road, Hornby, Christchurch. APHA 9223 B 23 rd ed. 2017.	1 MPN / 100mL	1					

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 21-Feb-2021 and 26-Feb-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech) Client Services Manager - Environmental

AURORA ENERGY LIMITED PO Box 5140, Dunedin 9058 PH 0800 22 00 05 WEB www.auroraenergy.co.nz



Chris Hansen Clark Fortune McDonald & Associates

Sent via email only: chansen@cfma.co.nz

Dear Chris,

ELECTRICITY SUPPLY AVAILABILITY FOR A PROPOSED FIVE LOT SUBDIVISION. SPEARGRASS FLAT ROAD, QUEENSTOWN. LOTS 1 & 2 DP 20531.

Thank you for your inquiry outlining the above proposed development.

Subject to technical, legal and commercial requirements, Aurora Energy can make a Point of Supply¹ (PoS) available for this development.

Disclaimer

This letter confirms that a PoS **can** be made available. This letter **does not** imply that a PoS is available now, or that Aurora Energy will make a PoS available at its cost.

Next Steps

To arrange an electricity connection to the Aurora Energy network, a connection application will be required. General and technical requirements for electricity connections are contained in Aurora Energy's Network Connection Standard. Connection application forms and the Network Connection Standard are available from www.auroraenergy.co.nz.

Yours sincerely

Niel Frear CUSTOMER INITIATED WORKS MANAGER

¹ Point of Supply is defined in section 2(3) of the Electricity Act 1993.

Chorus Property Development Team PO Box 9405 Waikato Mail Centre Hamilton 3240 Email: <u>develop@chorus.co.nz</u>

C H O R U S

Chorus Ref #: AW59473 Your Ref #:

C/- Clark Fortune McDonald & Associates

25 August 2020

Dear Chris Hansen

New Property Development Agreement:

AW59473 : AW: 125 Huneter Road, Queenstown-Lakes. 4 Lots (Lots 1-4)

Thank you for choosing Chorus New Zealand Limited (**Chorus**) to connect your development. We will help you get your new build ready and connected to some of the best broadband and voice services available in the world.

Please find attached your New Property Development Agreement and quote based on the scheme plans you have provided. This contract provides details of what we intend to do at your development along with any actions that are your responsibility. We understand there's a lot of information to digest. We recommend you go through the contract with your lawyer if you are concerned about any parts of it.

To progress your development with Chorus:

- Read, sign and complete the required details of the attached agreement to confirm that you
 accept the conditions and the quoted cost. The quote will expire 180 days from the date of issue.
 If this happens, you may need to reapply if you want to proceed with connecting your
 development.
- Once you have signed and sent us the agreement, please pay for your share of the build (\$10,223.50 incl. GST) within 30 days. You'll find all the options for payment on Page 2 of your contract.
- When we receive your completed agreement and payment, we will start the process to connect your development to our network. Once the design plan is finalised, we can proceed to provide you with materials and work with you to ensure these are installed correctly.
- Once your development is connected, the new occupants will be able to place an order with their broadband or phone provider to get their services up and running.
- Please take note of the design and build timeframes required to connect your development to our network:
 - Design: up to 28 working days from the date we receive your completed agreement and payment.
 - Build: usually 1-3 months from the materials being installed. This depends on the progress of your development, council requirements, or changes to the scope of work.

AW59473

25 August 2020

Key responsibilities:

So it's clear who does what, we've outlined the jobs that you'll need to do, and what we need to do to get your development connected. More detailed information can be found in your contract.

C H O R U S

Jobs for you:

- Provide us with your power plans if you want power and telecommunications in the same trench
- Trenching opening and backfill
- Notify us by emailing <u>develop@chorus.co.nz</u> when you require the telecommunication materials
- Pick up materials from our depot and store them safely
- Lay the materials we will oversee this to make sure it meets standard requirements
- Provide us with your 'As Builts' when installation is complete
- Provide us the Land Title Plans showing easements if applicable
- Register easements in our favour against the relevant Land Titles
- Install the 20mm lead-in greenpipe within the property boundary

See Appendix A for useful guides.

Jobs for Chorus:

- Provide a design based on the scheme plans and power plans you submit to us
- Provide the telecommunication materials to be picked up by you from our depot
- Oversee the laying of the materials in your trenches within your development
- Laying of materials outside of your development e.g. council land
- Jointing, testing and commissioning works once our network is in the ground
- Update our records so the new occupants can connect to the network through their broadband or phone provider
- Send you a clearance letter when your development is complete

Please don't hesitate to contact us if you have any questions, or for more information, visit <u>www.chorus.co.nz/develop-with-chorus</u>. We look forward to working with you.

Regards

Geordie Rumbles Property Development Coordinator

GRANT RAILTON

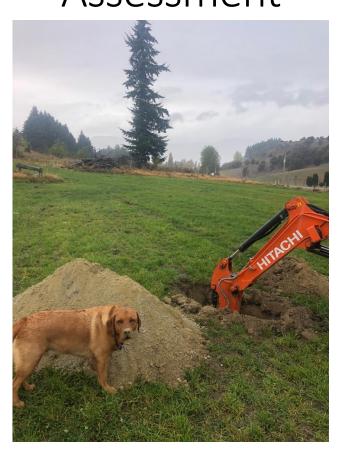
RAILTON CONTRACTING AND DRAINAGE LTD

INFO@RAILTONCONTRACTING.CO.NZ

WWW.RAILTONCONTRACTING.CO.NZ



Onsite Wastewater Disposal Site Soils Assessment



Prepared for: Duncan and Jan Robertson Location : 125 Hunter Road, Lower Shotover, Queenstown, Lot 1-2 DP20531 and section 1-3 SO 20437 OT 12A/419

Onsite Wastewater Disposal Site and Soils Assessment Form



INTRODUCTION

The objective of this form is to collate the required site and soll information that will support QLDC with evaluating the risks associated with installing any proposed Onsite Wastewater Disposal systems on a new subdivision or greenfield site.

This form can be used in conjunction with AF OSW which is designed to cover both the site assessment as well as the system design review.

REFERENCES

The design standard for waste water treatment and effluent disposal systems is AS/NZS 1547:2012. All references within this form relate to this standard.

RISK BASED APPROACH

QLDC has adopted a risk based approach which involves evaluating key factors relating to the site and soll features to ensure that any risk to environment or public health is fully mitigated. The key potential risks that QLDC will consider include, but are not limited to, the following:

High risks

Pathogen risks

Moderate risk

- Odours
- Loss of amenity service due to technology failure, power outage
- High capital and/or operating costs

Minor risks

- Slope instability on the steeper sites
- Noise
- Risk to cultural values
- Nutrients (nitrogen and phosphorus) and emerging contaminants

HIGH RISK APPLICATIONS

Throughout this application form there are a number of information fields that are highlighted in red. These relate to key risk factors that the system designer must consider during their design process. If these risks are present then an explanation of what design mitigations have been taken is required.

For systems that breach the requirements of Section 3, you will be required to raise an application with the Otago Regional Council for a Resource Consent. Once the ORC Resource Consent has been granted it can be referenced as part of the QLDC Building Consent Application.

QLDC reserves the right to engage expert peer review of applications that are either very high risk, or system designs which appear to have inadequate design mitigations in place. The cost of this will be oncharged to the applicant as part of their building consent fees.

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Last Updated: 24/05/2018

Unsite wastewater Dispusar site and sons Assessment runn



APPLICATION FORM CONTENTS

Int	roduction
Ap	plication Form Contents
1	Site Description
2	Site Assessor
3	ORC Resource Consent Requirements:
4	Site Assessment Details
5	Soil Investigation
6	Soil Category
7	Attachments Checklist
8	Applicant Statement:

SITE DESCRIPTION

1

Property Owner:	Duncan & Jan Robertson
Location Address:	125 Hunter Road , lower Shotover, Queenstown.
Legal Description (e.g. Lot3 DP1234) :	Lot 1-2 DP 20531 and section 1-3 SO 20437 OT 12A/419
List any existing consents related to waste disposal on the site:	none
General description of development and describe all sources of wastewater:	2 lot subdivision

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Last Updated: 24/05/2018

onsite wastewater Disposal site and sons Assessment Form

17/7/2VC1



SITE ASSESSOR

Company	Railton Contractiing and Drainage Itd	
Contact Name	Grant Railton	
Email	info@railtoncontracting.co.nz	
Phone	0274549028	
Qualifications/Technical Experience	Drainlayer #18880	

3 ORC RESOURCE CONSENT REQUIREMENTS:

Please complete below checklist to confirm whether an Otago Regional Council (ORC) resource consent will be required to discharge domestic waste water in the Queenstown Lakes District:

Yes	No	System Requirement	
		Daily discharge volume exceeds 2,000 litres per day	
	Discharge will occur in a groundwater protection zone or in the Lake Hayes catchment		
		Discharge will occur within 50 metres of a surface water body	
		Discharge will occur within 50 metres of an existing bore/well used to supply water for domestic needs or drinking water for livestock	
		There will be a direct discharge into a drain, water race or groundwater	
		Discharge may runoff onto another persons' property	

If any of these apply then you will need to make an ORC resource consent application for domestic wastewater discharges to land with a maximum volume of 14,000 litres. The application form for this is Form 6A.

Once the ORC consent has been granted please enter the reference number below and provide a copy of the approved ORC consent.

ORC Resource Consent Number:

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4 SITE ASSESSMENT DETAILS

For the areas where the treatment plant and land application system and reserve area are to be located, please provide the following information:

Land use description:	Farm land
Topography:	fiat land with steeper terraces to the north
Slope angle:	Up to 15 degrees
Vegetation cover:	Grass and trees
Are there areas of potential ponding?	No
Are there risks assoclated with drainage patterns and overland flow paths?	Drains to the west
Does site have Flood potential? (show with return period on site plan)	Yes No If Yes, please provide information below on what design considerations have been adopted to mitigate this risk (e.g. elevated tanks, sealed lids etc.)
is the system within 100m distance to nearest open water bodies, emphemeral streams and wetland?	Yes No If Yes, please provide information below on what design considerations have been adopted to mitigate this risk.
is the system within 50m distance to stormwater drains and stormwater soakage areas?	Yes No If Yes, please provide information below on what design considerations have been adopted to mitigate this risk.
OSSA	Page 4 of 8 Last Updated: 24/05/2018

Unsite wastewater Disposal Site and Soils Assessment Form



Are Water bores within 50m? (reference ORC Maps)	If Yes In ORC resource consent is required		
Are there are other key site features that may affect the system design?	No		
Slope stability assessment- For land slopes greater than 15° (25%) summarize any areas unsuitable for waste water irrigation.	conditions clo	ground cat 3 soils or better ,lot 2 ground use to speargrass flat rd is silt down to 2m + soil for secoundary treatment with dripline disposal	
What is the depth to the highest potential ground water level:	Summer:	more than 5m plus	
potential ground water level:	Winter:		
	Information Source:	Test pits/ local knowledge / ORC	
Is there potential for waste water to short circuit through permeable soils to surface and / or ground water?		No provide information below on what design ns have been adopted to mitigate this risk.	

5 SOIL INVESTIGATION

For the areas where the land application system and reserve area are to be located, provide the following information

Has a Site Specific Field investigation been completed? Is Report attached?	 Yes No Note: Report shall include a plan showing test pit or bore location, and a detailed soils report in accordance with Table 82 and Figure B1 or and equivalent format and detail. Photos of the profiles and soils shall be included including photos of soil ribbon tests (Section E4.1)
Field investigation date:	12 april 2021

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Number of test pits or bores:	5
If fill material was encountered during the soil investigation, describe the fill material and explain how this will impact on the waste water land application system design and performance?	No fill material was found, natural ground conditions
Has the soil permeability beneath the proposed land application field been tested?	Yes No If Yes please provide details of test method and results (e.g. Percolation test method (refer to B6 for applicability):
	visual assessment only soil cat 3-4 soil condtions

SOIL CATEGORY

Based on the site investigation report please confirm the soil category that is present for the land application system.

Select One	Soil Category (Table 5.1)	Soll Texture (Appendix E)	Drainage Characteristic	Risk limits for Groundwater Setback
	1	Gravel and sands	Rapid	5m
	2	Sandy loams	Free	5m
	3	Loams	Good	1.5m
	4	Clay loams	Moderate	1,5m
	5	Light clays	Moderate to slow	0.6m
	6	Medium to heavy clays	Slow	0.6m

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Is the groundwater level (refer section 4) within the above risk limits for the site?	Yes No If Yes, please provide information below on what system design considerations have been adopted to mitigate the risk to groundwater. For example:
	Secondary treatment
	Tertiary UV treatment
	 Modified trench or bed details for category 1 soils to ensure even distribution
	Test pits revealed good ground conditions for wastewater disposal, lots 1&2 standard secondary treatment plants can be used

Note: The soil category and groundwater level will determine the required loading rate for any land application system.

7 ATTACHMENTS CHECKLIST

Select One	Required Documents			
	Copy of any existing QLDC or ORC consents			
	Copy of QLDC Site & Soils Assessment (If previously completed)			
	Copy of slope stability geotechnical report (if required)			
	Copy of flood hazard assessment (if required)			
	Site Specific Field Investigation Report. Ensure It covers information requirements covered in sections 5 &6			
	To scale site plan. The following must be included Buildings Boundaries Treatment system components Reserve d Embankments Cutoff drains / diversion bunds Water boo Stormwater drains, discharge points or so Flood risk areas Other wastewater treatment units and di	lisposal area Retaining Walls dies bakage facilities		
OSSA vision 2	Page 7 of 8	Last Updated: 24/05/2018		



Water bores
 Direction of ground water flow
 Existing and proposed trees and shrubs
North arrow

8 APPLICANT STATEMENT:

I believe to the best of my knowledge that the information provided in this application is true and complete. I have the necessary experience and qualifications to design the above proposed waste water treatment system in accordance with the requirements of AS/NZS 1547:2012:

Name: Grant Railton

Signature:

Date: 14-Apr-2021

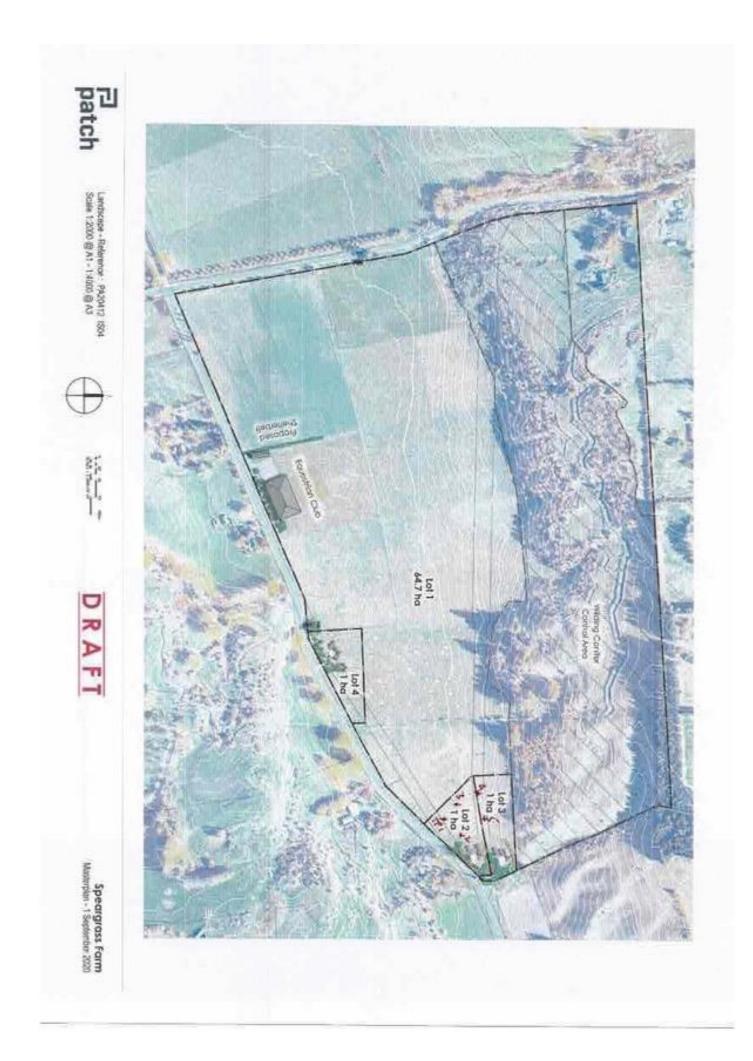
Please scan the completed document to PDF and upload along with supporting information to the QLDC Sharefile portal:

http://www.gldc.govt.nz/index.php/planning/resource-consents/apply-online/

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Onsite Wastewater Disposal Site and Soils Assessment Form

14/4/2021









Project Number: 6-XZ628.00

125 Hunter Road, Dalefield Preliminary Site (HAIL) Assessment Report

1 September 2020







wsp

Contact Details

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Document Details:

Date: September 2020 Reference: 6-XZ628.00 Status: Final

Prepared by

XXDond

Lisa Bond CEnvP Principal Contaminated Land Specialist

Reviewed by

Megan Baddiley CEnvP Environmental Engineer

Approved for release by

B

Robert Bond Work Group Manager Geotechnical & Environmental



Document History and Status

Revision	Date	Author	Reviewed by	Approved by	Status
0	01/09/2020	LAB	MB	RB	Final

Revision Details

Revision	Details

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Disclaimers and Limitations

This report ('**Report**') has been prepared by WSP exclusively for Duncan Robertson & Jan Hunt ('**Client**') in relation to a Preliminary HAIL Assessment ('**Purpose**') and in accordance with the offer of service *6-XZBID.03 and signed short form agreement dated 25 August 2020. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

In preparing the Report, WSP has relied upon data, surveys, analyses, designs, plans and other information ('**Client Data**') provided by or on behalf of the Client. Except as otherwise stated in the Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable in relation to incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

1 Introduction

A Preliminary Site (HAIL) Assessment has been undertaken on behalf of Duncan and Jan Robertson for a site located at 125 Hunter Road, Dalefield (herein referred to as 'the site') in order to assess the potential for HAIL activities and contamination to be present on the site.

Covering approximately 61 hectares, the site is proposed to be subdivided into 4 Lots. Lots 2 to 4 are proposed for a rural residential land use change with the balance (Lot 1) to be retained as production land for use as an equestrian centre. Details of the proposed subdivision are shown in Appendix A.

A land use change from rural production to rural residential and a small amount of soil disturbance is expected as part of the development of Lots 2, 3 and 4.

1.1 Objective

This assessment will focus on determining whether Hazardous Activities and Industries List (HAIL) activities have been undertaken on the site as defined by the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS).

1.2 Scope of Work

In order to achieve the objective, set out above, the following scope of works was undertaken:

- A review of the site history from aerial photographs and anecdotal evidence,
- A site inspection and walkover,
- A review of documented data from Otago Regional Council (ORC) and Queenstown Lakes District Council (QLDC) with respect to the site, and
- Determination of HAIL Activities on the site along with recommendations for further work to assess the potential risk to human health associated with soil borne contaminants should it be deemed necessary.

2 Site Description

The site is located at the corner of Speargrass Flat Road and Hunter Road, approximately 6km southeast of Wanaka town centre as shown on Figure 1 below. The site details are provided in Table 1, with the Quickmap site boundaries shown in Figure 2.

Site Address	125 Hunter Road, Dalefield	
Territorial Authority	Queenstown Lakes District Council	
Legal Description	Lot 1 & Lot 2 DP 20531	
Title	OT12A/419	
Valuation No.	29071-17400	
Owner	Duncan John Robertson	
Approximate total site area	61.78ha	
NES Permitted Activity threshold volumes: 1) disturbance, and 2) yearly off-site movement of soil based on the approximate site area	1) 6,178m³ 2) 30,890m³	

Table 1: Site Identification

Geology	The GNS geology webmap (1:250,000) indicates the northern part of the site to comprise Aspiring lithologic association pelitic schist with the southern part of the site containing Holocene Age river deposits generally comprising loose, commonly angular boulders, gravel, sand and silty forming alluvial fans.
Topography	The southern part of the site is generally level with the northern section comprising a steep gradation uphill towards the north.
Recognised Hail Status	Otago Regional Council online HAIL database was reviewed on 28/08/2020. No HAIL sites are recorded within 1 km of the site.: <i>The site does not currently appear on the database;</i>
Nearest Surface Water Body	A small pond is noted on the corner of Speargrass Flat Road and Lower Shotover Road. A larger pond is noted approximately 250m north east of the site at the top of the hill on Hunter Road. No surface water was noted on site, however an irrigation pipeline was noted running north- south through the middle of the site, passing under Speargrass Flat Road and up the hill on the southern side of the road.
No. of known Boreholes and wells within 500m	The ORC bore database indicates that there are no bores present on the site itself with the nearest being located adjacent to the site along Speargrass Flat Road. These are in use for domestic purposes taking water from the Wakatipu Basin Aquifer. Groundwater depths are typically 10m bgl A small community supply is located near the south east corner of the site.
Proposed Site Use	It is understood that the site is to be subdivided into four sections. Three of these are proposed for land use change to a rural residential end use with the remaining area to continue as production land. Subdivision plans are appended to this report.
Details of Resource Consents	 1994: Design control - dwelling 1997: Wakatipu Riding Club - erect new storage shed 2003: Erect another dwelling & new stable barn 2005: Extension of existing farm building
Details of Building Consents	 1994: Erect dwelling 1997: Erect Storage Shed 2004: Alterations to dwelling (CCC not issued) 2004: Erect new dwelling (CCC not issued) 2016: Sunrise Balloon Adventures Ltd - Land use consent for hot air balloon activity

Project Number: 6-XZ628.00 Preliminary Site (HAIL) Assessment Report 125 Hunter Road, Dalefield



Figure 1: Site Location Plan

Project Number: 6-XZ628.00 Preliminary Site (HAIL) Assessment Report 125 Hunter Road, Dalefield



Figure 2: Quickmap Plan of site and surrounds

3 Site History

Details of the site history have been gained from a review of sources including historical aerial photographs from Google Earth and Retrolens, historical topographical maps from Maps Past, a review of Opus's Quickmap ArcGIS database and a search of council records. Historical information including aerial photography is presented in Appendix B.

The conditions on the site over the timeframe searched are summarised in Table 2.

Table 2: Site History Summary

Photograph Year and Source	Observations on Site	Observations - Site Surrounds	
1929 Maps Past	The site is noted to have a road running diagonally through the site with the site divided into numerous separate lots		
1956the central paddocks showing signs of surface water flowing across it (flood irrigation) in a southerly direction The surface water appearsre		To the south of Speargrass Flat Road is a residential development surrounded by paddocks along with rocky outcrops and standing water to the south west. Further paddocks are noted to the west of the site.	
		To the north is a hillside with pines and rough scrubland.	
1958 Retrolens	The site remains as paddocks with a small wood noted in the centre of the site.	No significant change since 1956.	
1966 Retrolens	No significant change since 1958. Some trees are noted along the base of the hill.	No significant change since 1958.	
1976 Retrolens	No change to the site is noted.	Small rural residential development is noted to the north of the site.	
1979 Maps Past	No change to the site is noted	To the east of the site is located Mooney Swamp	
	Paddocks are still present on the site with a structure noted in the centre - possibly a barn or shed Treeline is noted to still be spitting the area in two.	Rural residential developments are present both to the north and south west of the site, however the surroundings are still predominated by paddocks or open ground.	
1984 Retrolens	To the north of the paddocks is located a roadway which follows the base of the hillside leading from Hunter Road to a structure on the far eastern boundary of the site. Access to this structure is also noted from Speargrass Flat Road to the south.	To the north of the paddocks is located a roadway which follows the base of the hillside leading from Hunter Road to a structure on the far eastern boundary of the site. Access to this structure is also noted from Speargrass Flat Road to the south	
1999 Maps Past	No change is noted on the map	No change	
2001 Retrolens	First colour imagery available No significant changes are noted on the site.	A small residential development is noted to the north west. Rural residential developments are	

Photograph Year and Source	Observations on Site	Observations - Site Surrounds
		noted to the north of the site and on the southern side of Speargrass Flat Road.
2004 Google Earth	So significant change to the site since 2001.	No changes since 2001.
2010 Google Earth	The majority of the site remains as paddocks. Small structures (possible sheds or barns) are located along the southern boundary. A pipeline running north - south is located on the eastern side of the site.	No significant changes since 2004.
2016 Google Earth	No significant changes since 2010.	No significant changes since 2010.

3.1 Discussion

The site has been grassed paddocks for over 60 years. Over this time there have been minor structures built on parts of the site, namely barns or sheds. The northern area of the site comprises a hillside where a stream or irrigation race meanders across from west to east. More recently this has been connected into a pipeline which runs north to south across the eastern side of the site and under Speargrass Flat Road.

The surroundings to the site have undergone numerous subdivisions for rural lifestyle type developments, particularly to the north of the site.

No evidence of potential HAIL activities either on the site or its immediate surroundings are noted within the aerial photography and mapping.

4 Walkover Survey

A site walkover was undertaken on 31 August 2020 by a WSP Opus Engineer. A summary of observations is presented in Table 3, with photographs taken at the time of the site visit presented in Appendix C.

Table 3: Walkover Summary

Site Access	The site was accessed via a gateway along Speargrass Flat Road		
Current Site Use	Grassed Paddocks		
Existing Structures	Equestrian jumps were present on the eastern side of the site which were overgrown and unused. A water supply pipeline is present running north south through the centre of the site.		
Existing Vegetation	Grassed paddocks showed no signs of distress. Trees on the eastern boundary had been felled and stockpiled		
Odours	None noted		
Adjoining Sites Uses	Low intensity agriculture (paddocks and grazing) or rural lifestyle		
Surface Water Bodies	None noted on site.		
Site Observations	The southern area of the site was generally level with a gentle slope upwards to the north. At the field boundaries this incline steepened with natural scrub and pines present on the slope. No HAIL activities were noted on or surrounding the site.		

5 Implications of Identified HAIL Activities

5.1 Contaminants of Potential Concern

The site has been used for grazing or equestrian purposes since at least the early 1950's. No record of fertiliser application or pesticide use is known to have occurred by the current site owners who have owned the site since at least 1988.

As such, no potential contaminants of concern are considered to be present on the site

5.2 Implications of the NES

The NES is relevant when specified activities are undertaken on HAIL sites. These activities are:

- Removing or replacing a fuel storage system;
- Sampling soil;
- Disturbing the soil;
- Subdividing land; and
- Changing the use of the piece of land.

If HAIL activities are noted to have occurred on the site or its surroundings assessment of the risks to human health associated with soil borne contaminants is required.

For this site there is a proposal to subdivide the site with three of the subdivisions undergoing a change of land use and potential ground disturbance for rural residential development.

5.3 Conceptual Site Model

The conceptual site model is used to support decision making process for contaminated land management.

The five basic activities associated with developing a conceptual site model are:

- Identification of potential contaminants;
- Identification and characterisation of the source(es) of contamination;
- Delineation of potential migration pathways through environmental media, such as groundwater, surface water, soils sediment, biota, air, service lines;
- Identification and characterisation of potential receptors (human, ecological or building infrastructure);
- Determination of the limits of the study area or system boundaries.

Data gaps and uncertainties are identified during the preparation of the conceptual site model, which assists in designing any detailed investigation that may follow.

For there to be an effect on receptors there must be a contamination source and a mechanism (pathway) for contamination to affect human health or the environment (receptor).

As no source of potential contamination have been found to exist on the site, the conceptual site model shows that there is no risk to human health from soil borne contaminants.

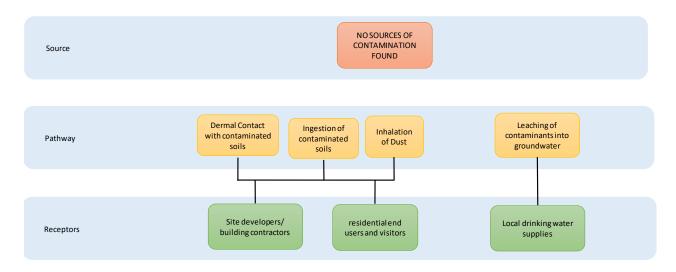


Figure 3: Conceptual Site Model

6 Conclusion

The conceptual site model and initial qualitative human health risk assessment presented herein is based upon information gained from a site inspection, anecdotal evidence, information gained from ORC, QLDC and other sources.

The site identified in this investigation has been triggered under the NESCS as a result of a proposed subdivision, change in land use and rural residential development. The site history, anecdotal evidence, historical aerial photography and site inspections have confirmed that the site has only been used as farmland/pasture.

No HAIL activities were noted to have taken place on the site. The Regulations within the NESCS are therefore **NOT** considered applicable to the proposed subdivisions where a land use change is proposed.

Based on the findings of this Preliminary Site Assessment, taking into consideration the proposed location of the subdivisions where a change of land use will occur, the site condition and site history, it is highly unlikely that there will be a risk to human health if rural residential development is undertaken within these proposed subdivision areas on this site.

6.1 NESCS Implications

This Preliminary Site (HAIL) Assessment identifies that the whole site, including the proposed subdivision areas, as shown in Appendix A, have not been subject to HAIL activities as defined within the NESCS. As such, the NESCS regulations do not apply to the proposed development area.

6.2 Safety in Design

Safety in Design (SID) considers the safety of those who are involved in the construction of, maintenance of, cleaning of, repair of and demolition of a structure, or anything that has been constructed.

As part of the assessment of this site, we have taken reasonably practicable steps to assess the potential for hazards associated with potentially contaminated land to exist. We have, through the development of a conceptual site model assessed the qualitative level of risk posed to human health and have made various recommendations to address the plausible risks.

Where identified this report indicates hazards and risks to health and safety associated with contaminated land which must be communicated to the design team, the client and associated stakeholders as required by the Health and Safety at Work Act 2015.

6.3 Recommendations

Based on the results of this investigation, WSP recommends that:

- The site is suitable for subdivision, land use change and potential rural residential development in terms of the NESCS:
- Should any ground conditions be encountered across the site which are not anticipated from the findings of this report a Suitably Qualified and Experienced Practitioner (SQEP) should be consulted in order to reassess the risks to human health;
- This Preliminary Site Assessment report is submitted to the consenting authority; and
- This Preliminary Site Assessment report is submitted to the regional authority in to facilitate updating the HAIL database.

Appendix A Proposed Subdivision Plans

125 Hunter Road, Dalefield





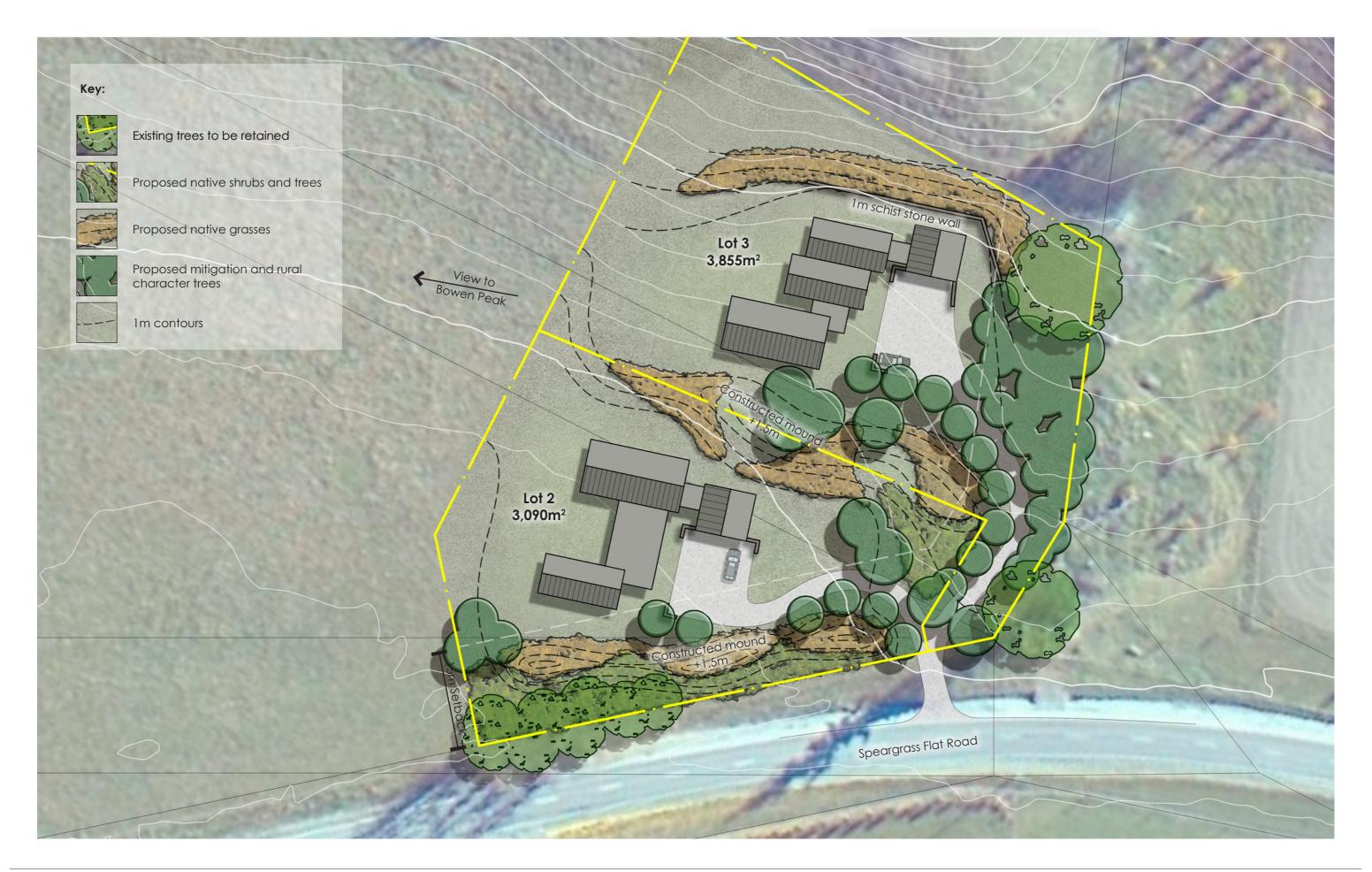
Landscape - Reference : PA20412 IS03 Scale 1:2000 @ A1 - 1:4000 @ A3



0 20 40 70 100n SCALE = 1:2000 AT A1



Document Set ID: 6999224 Version: 1, Version Date: 13/09/2021 Speargrass Farm Masterplan - 8 July 2020





Landscape - Reference : PA20412 IS03 Scale 1:250 @ A1 - 1:500 @ A3



0 2.5 5.0 12.5 SCALE = 1:250 AT A1



Document Set ID: 6999224 Version: 1, Version Date: 13/09/2021 Speargrass Farm Lot 2 & 3 Landscape Plan - 8 July 2020





Landscape - Reference : PA20412 IS03 Scale 1:250 @ A1 - 1:500 @ A3



0 2.5 5.0 12.5 SCALE = 1:250 AT A1



Document Set ID: 6999224 Version: 1, Version Date: 13/09/2021 Speargrass Farm Lot 4 Landsacpe Plan - 8 July 2020

Appendix B Historical Information

125 Hunter Road, Dalefield

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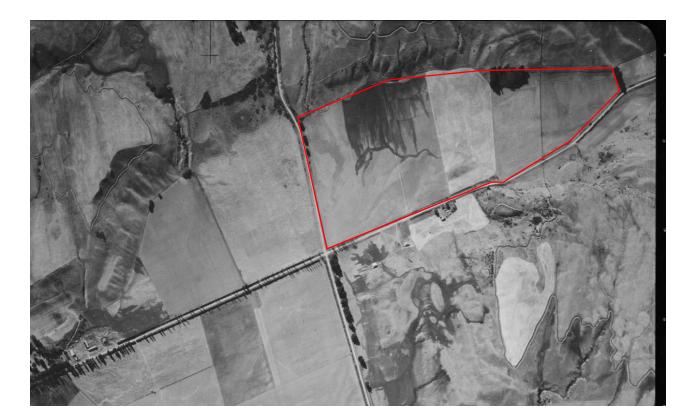






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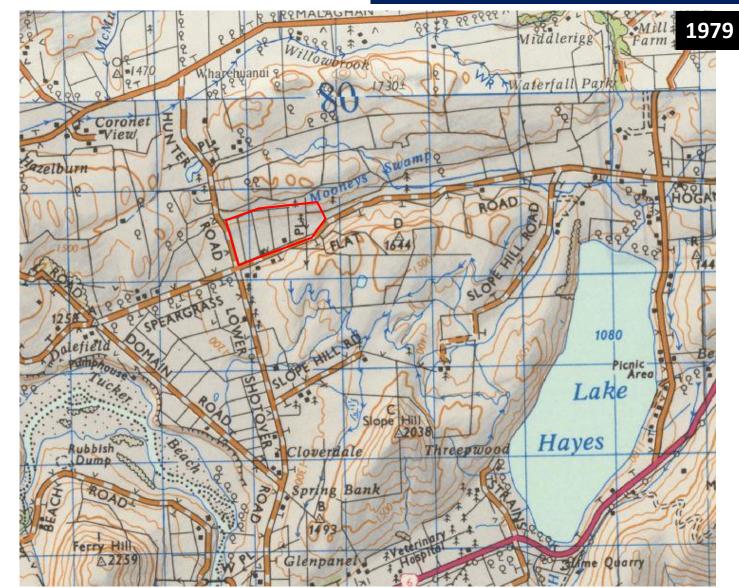
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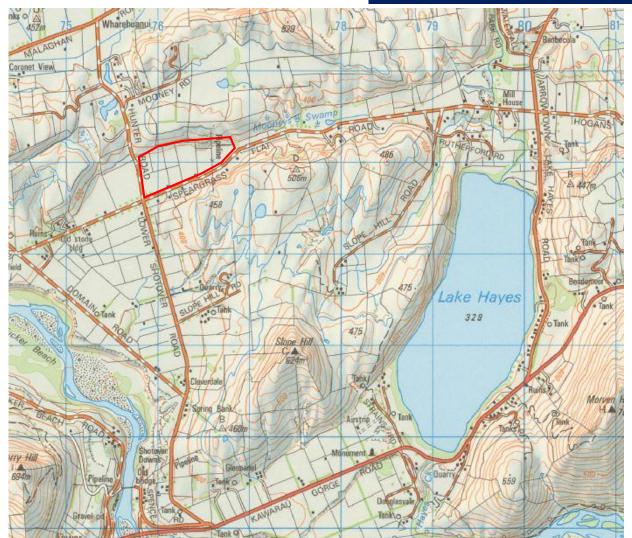
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RECORD OF TITLE UNDER LAND TRANSFER ACT 2017 FREEHOLD Search Copy



Identifier Land Registration District Date Issued

Prior References

OT11A/1168

Estate	Fee Simple
Area	63.9873 hectares more or less
Legal Description	Lot 1-2 Deposited Plan 20531 and Section 1-3 Survey Office Plan 20437

Registered Owners

Duncan John Robertson

Interests

Subject to Section 308 (4) Local Government Act 1974 - See DP 20531

885724 Transfer creating the following easements in gross - 30.6.1995 at 12.14 pm

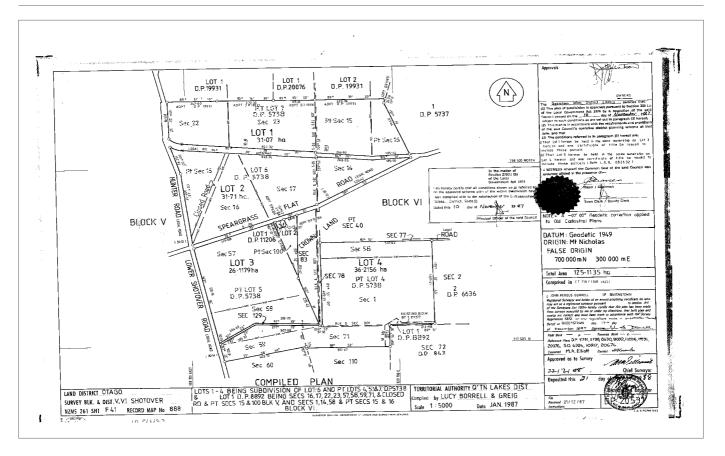
OT12A/419

Otago 21 April 1988

Туре	Servient Tenement	Easement Area	Grantee	Statutory Restriction
Convey water	Lot 1-2 Deposited Plan	AV Transfer 885724	Arrow Irrigation	
	20531 - herein		Company Limited	
Convey water	Lot 1-2 Deposited Plan	AW Transfer 885724	Arrow Irrigation	
	20531 - herein		Company Limited	

Subject to Section 120(9) of the Public Works Act 1981

9486238.2 Mortgage to Southland Building Society - 26.8.2013 at 4:25 pm



Identifier OT12A/419

