

Mt Cardrona Station  
c/o Brown and Company Planning Group  
PO Box 1467  
**Queenstown**

TDG Ref: 14202  
29 November 2016

Attention Mr Jeff Brown

Issued via email: [jeff@brownandcompany.co.nz](mailto:jeff@brownandcompany.co.nz)

Dear Jeff

### **Mount Cardrona Station Plan Change**

We understand that the Mt Cardrona Station Limited is investigating a new structure plan by way of Plan Change for the Mount Cardrona Station (MCS) that would enable a golf course to be developed as part of the commercial recreational activities that would be available.

TDG previously prepared a transport assessment report for the MCS Plan Change Application in 2007. That report concluded that the Special Zone could accommodate 2,500 visitor accommodation and residential units and still maintain a satisfactory level of service on the road network. This report provides an update on recent traffic counts and provides an assessment of the potential traffic effects that could arise as a result of the proposed development.

#### **1. Existing Transport Infrastructure**

Cardrona Valley Road and Crown Range Road form the most direct link between Wanaka and Arrowtown. Crown Range Road is classified as an arterial road within the Queenstown Lakes District Council (QLDC) District Plan between State Highway 6 and Bridge 11 on Cardrona Valley Road. Cardrona Valley Road is not explicitly listed within the road hierarchy and therefore is classified as a local road. In practice however, its function is that of an arterial road since it represents a continuation of Crown Range Road and forms a dominant element of the road network connecting major settlements.

Cardrona village is located approximately 21km south of Wanaka along the Cardrona Valley Road. The MCS Special Zone is located between Cardrona village and the Cardrona Ski Field access road.

There are no sealed roads within the MCS Special Zone and no existing intersections. However, there are two driveways: one approximately 130m south of the ski field access road and one about 400m south of the ski field access road.

The District Plan's planning maps show a legal road on the east side of Cardrona Valley Road, namely Tuohys Gully Road. This legal road intersects with Cardrona Valley Road about 200m south of the ski field access road. In practice, Tuohys Gully Road has been formed on an alignment about 150m to the south of the legal road alignment.

**Figure 1** shows the legal road boundaries and existing formed roads south of the ski field access road. It shows that there is no formed road along the legal road alignment and that a formed road meets Cardrona Valley Road about 350m south of the ski field access road.



**Figure 1: MCS Access Location (QLDC GIS Map System)**

Cardrona Valley Road has been constructed as a rural, two lane road with 3.5m wide traffic lanes in each direction and 300mm sealed shoulders on each side of the carriageway. The sign-posted speed limit on Cardrona Valley Road is generally 100km/h but the approaches to Cardrona village have a speed limit of 70km/h, and within the village the posted limit is 50km/h. The northern speed transition point from 100km/h to 70km/h is located 120m north of Pringles Creek Road).



**Photograph 1: Cardrona Valley Road – View South towards Tuohys Gully Road**



## 2. Existing Travel Patterns

### 2.1 Traffic Volumes

QLDC collects traffic volume information on roads within the District at different times of the year. The following table shows the average daily traffic volumes on Crown Range Road and Cardrona Valley Road collected over recent years.

Location	Date	Weekday	Weekend
Crown Range Road – 7km north of SH6	Jan 2015	2,500	1,900
Crown Range Road – 4km north of SH6	Apr 2015	2,000	2,450
Cardrona Valley Road – 4km north of Crown Range Road	May 2015	730	1,000
Cardrona Valley Road – 2km north of Crown Range Road	Aug 2014	1,900	1,950
Cardrona Valley Road – 1.5km north of Crown Range Road	Sep 2015	2,000	1,800

**Table 1: Two-way Traffic Volumes Per Day**

The traffic volume counts show a wide range of variation across the year with tourist traffic and skiing related traffic affecting volumes in the peak summer and winter seasons. Typical average daily traffic volumes are in the range 2,000-2,500 vehicles per day (vpd) at peak periods of the year.

### 2.2 Road Safety

The NZTA Crash Analysis System has been used to investigate reported crashes and contributing crash factors on Cardrona Valley Road in the vicinity of Mount Cardrona Station and the Cardrona village. A total of eight crashes have been reported over the five year period 2011-2015, with no further crashes being reported to date in 2016. One crash resulted in serious injuries and one crash in minor injuries. No injuries were reported for any of the other crashes.

The serious injury crash occurred when a cyclist started a U-turn without checking that the road was clear behind. The minor injury crash occurred south of Cardona village when a driver lost control of their vehicle on a bend in slippery conditions.

Five crashes involved a single vehicle only and were attributed to loss of control on the part of the driver. The contributing factors included slippery road conditions, loose animals and inexperience.

The reported crashes are widely dispersed along the section of road that has been examined and have a variety of contributing factors. No underlying safety concerns with the road environment have been identified that would be contributing to the crashes.

## 3. Proposed Development

A copy of the proposed new structure plan for MCS is attached to this report. As with the 2007 Plan Change application, the Plan Change's proposed structure plan incorporates a spine road through the MCS Special Zone linking Cardrona Valley Road with the Cardrona Ski field Access road. The structure plan shows a range of activity areas enabling different types of development including a village centre, various living areas, a hotel and provision for the golf course and related activities.





An indicative development plan for the activity areas suggests that the structure plan would enable construction of about 580 residential units, a 140 room hotel and 12 hole golf course. This represents a lower density of development than was assessed in the 2007 ITA.

## 4. Traffic Generation

### 4.1 Permitted Baseline

The District Plan includes a rule<sup>1</sup> that limits the total number of residential units that can be developed within the MCS Special Zone to 1,000.

For transport assessment purposes, the QLDC Engineering Code of Practice states that an average traffic generation rate of 8vpd per unit should be adopted. On this basis, the MCS Special Zone could generate 8,000vpd if it was developed with 1,000 units.

It has been noted that QLDC traffic generation rate is higher than the rate adopted in the 2007 transport assessment prepared by TDG in support of the 2007 Plan Change application that established the Special Zone, namely 4vpd per unit. In practice, the average traffic generation of the Special Zone is likely to fall between these values and most likely to be at the lower end of this range. It has been noted that the ITE Trip Generation Manual suggests that holiday resort visitor accommodation has an average daily traffic generation rate of 3vpd per unit. For the purposes of this assessment therefore and to be conservative, the traffic generation rate that was previously adopted and approved as part of the 2007 Plan Change (4vpd per unit) has been used.

If the MCS Special Zone was developed to the maximum permitted level, then it could generate up to approximately 4,000vpd based on a traffic generation rate of 4vpd per unit.

### 4.2 Development Proposal

The NZTA Research Report no 453 "Trips and Parking Related to Land Use" (RR453) contains information on expected traffic generation rates for visitor accommodation including motels and hotels. This has been used as the basis of forecasting the potential traffic generation of the MCS Development as a whole. RR453 recommends adopting the 85 percentile rates for assessment purposes, that is, a traffic generation rate of 3vpd per unit for the motel units and 6.4vpd per room for the hotel.

In practice, the rate for the hotel is considered to be very high for a rural location where a high proportion of visitors are likely to be travelling by coach and there would be a low volume of taxi movements. To be consistent with the original assessment for the approved Special Zone, each room has been treated as providing for visitor accommodation and the rate of 4vpd per room adopted, accordingly.

Although the final composition of the development could vary, it is expected to include about 580 residential units and 140 hotel rooms. For comparison purposes, a development scenario with the maximum permitted number of units has also been developed. For this maximum development scenario, the visitor accommodation would be expected to comprise a mix of hotel and motel type accommodation. For the purposes of this scenario, the average daily traffic generation has been based on 100 motel type units being developed.

The feasibility study for the golf course indicates that the traffic generation will be highly seasonal. During the winter months, it is expected that only about 20 rounds per day would be played compared with about 80 during the peak summer period. From a traffic generation

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<sup>1</sup> QLDC District Plan Section 12.22.5x



perspective, it is expected that on average each round of golf will typically involve two cars and four vehicle movements (two arrivals plus two departures). On this basis, the golf course could generate up to about 80vpd in the winter and up to 320vpd during the summer.

The following tables provide a summary of the expected traffic generation of the special zone if it was developed as currently proposed and also if developed to its maximum. The potential traffic generation of a café and small scale retail activity within the Special Zone has not been included because it is anticipated that this would primarily involve internal travel by residents rather than travel on the external road network.

Activity	Quantity	Traffic Generation Rate	Average Daily Traffic Generation
Residential	580 units	4vpd per unit	2,320
Visitor Accommodation	140 rooms	4vpd per room	560
Golf Course (Summer)	20 rounds	4 per round	80
Golf Course (Winter)	80 rounds	4 per round	320
<b>Total (Summer)</b>			<b>2,960</b>
<b>Total (Winter)</b>			<b>3,200</b>

**Table 2: Expected Traffic Generation of Proposed Development**

Activity	Quantity	Traffic Generation Rate	Average Daily Traffic Generation
Residential	580 units	4vpd per unit	2,320
Motel units	100 units	3vpd per units	300
Visitor Accommodation	320 rooms	4vpd per room	1,280
Golf Course (Summer)	20 rounds	4 per round	80
Golf Course (Winter)	80 rounds	4 per round	320
<b>Total (Summer)</b>			<b>3,980</b>
<b>Total (Winter)</b>			<b>4,220</b>

**Table 3: Expected traffic Generation at Maximum Development**

Based on the mix of activities identified in Table 2, the development proposal could be expected to give rise to a daily traffic generation in the range 2,960-3,200vpd. Although the final mix of activities could differ from the indicative development scenario outlined above, it is expected that this would result in only small changes to the total traffic generation. If the Special Zone was developed to the maximum level permitted, it could generate 3,980-4,220vpd.

RR453 suggests that the typical peak hour traffic generation of residential and visitor accommodation is 0.8 vehicle movements per hour (vph) per unit. On this basis, the development proposal could generate about 580vph in the peak hour.

The ITE Trip Generation Manual suggests that about 65% of all vehicle movements associated with resort accommodation will be outbound in the morning (7:00-9:00am) with this pattern reversing in the evening (4:00-6:00pm). With this pattern of movement, there would be about 380vph outbound vehicle movements in the morning peak hour and 200vph inbound vehicle movements.



## 5. Effects on the Transport Environment

The District Plan rules<sup>2</sup> permit development of 1,000 residential or visitor accommodation units. This level of development would result in average daily traffic generation of about 4,000vph based on a rate of 4vpd per unit. Under the MCS structure plan now proposed, the maximum combined traffic generation of the visitor accommodation and golf course activities could marginally increase to about 4,200vpd. This level of increase would not be noticeable to drivers because it would be within the typical day to day variation in traffic volumes that can occur across the year. On this basis, it has been concluded that the development would not contribute to traffic effects that are greater than anticipated and provided for under the District Plan.

In practice, the anticipated level of development will result in less than 1,000 units being developed within the Special Zone and there will be a corresponding reduction in the average daily traffic generation. The current proposal anticipates about 580 residential units and 140 hotel rooms. This level of development would result in lesser traffic effects than anticipated and provided for in the District Plan.

The speed limit on Cardrona Valley Road in the proposed location of the new intersection providing access to the Special Zone is 100km/h. In this speed environment, it will be necessary to provide left and right turn bays on Cardrona Valley Road so that turning vehicles can decelerate safely clear of any through traffic.

The MCS Special Zone structure plan contained within the District Plan shows access to the zone being provided by a new intersection about 50m south of Tuohys Gully Road. Since the short separation of the two intersections and their left-right stagger would prevent an intersection being design that complied with current design standards, the new structure plan includes an intersection about 25m north of the existing Tuohys Gully Road intersection. In this location, it will be possible to construct right and left turn lanes for both intersections with no overlap of turning movements. A sight distance to the north and south of the intersection of 250m can be achieved but may require some clearance of vegetation outside the road reserve and within the MCS land.

## 6. Conclusions

Based on the development potential associated with the revised MCS Special Zone structure plan now being proposed, it has been concluded that the current proposal would result in lower traffic generation than permitted under the District Plan rules. On this basis, it will result in lesser traffic effects than anticipated by the District Plan.

If the Special Zone was developed with the maximum number of units permitted and the golf course, then the average daily traffic generation would be marginally higher than with the residential development only. It is considered that the higher volume of traffic movements would not be noticeable to drivers because it would be distributed across the day and would be within the typical range of variation in traffic volumes that will occur from day to day and across the year.

The proposed location of the MCS Special Zone access to Cardrona Valley Road has been moved north of the formed alignment for Tuohys Gully Road because the left-right stagger and close proximity of the two side roads would allow an intersection design to be developed that complies with current best practice standards. The new location for the intersection removes the conflict with the right turn movements and still provides adequate sight distance for the speed environment.

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<sup>2</sup> QLDC District Plan Section 12.22.5x



Overall, it has been concluded that the proposed changes to the Mount Cardrona Station Special Zone will not generate adverse effects on road safety or efficiency.

We trust that this report is clear but would be happy to discuss any matter raised as necessary.

Yours sincerely  
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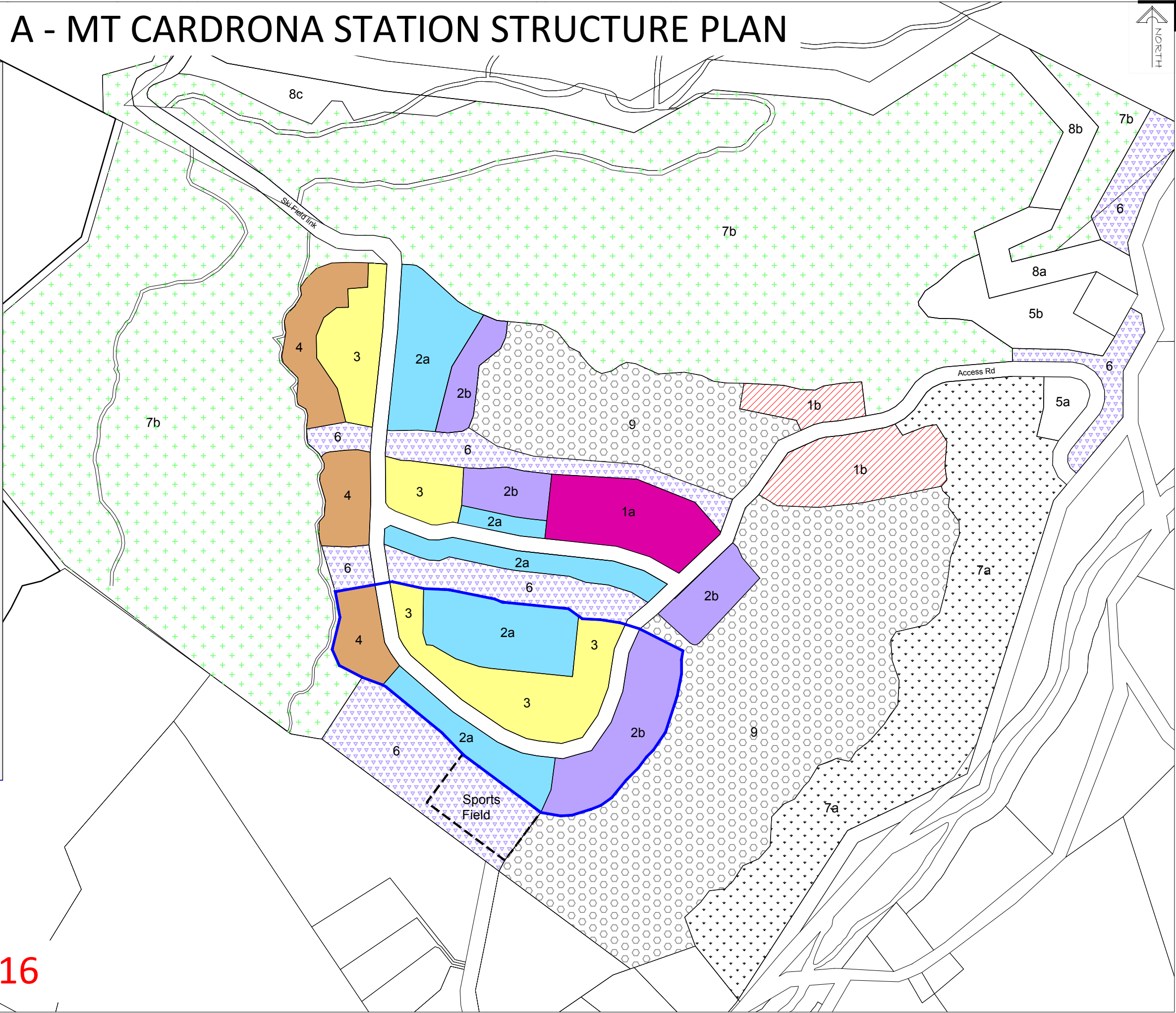
# STRUCTURE PLAN A - MT CARDRONA STATION STRUCTURE PLAN



**LEGEND**  
Activity Areas

- Activity Area 1a - Hotel / Village Green  
2.71ha
- Activity Area 1b - High Density Living / Visitor Accommodation  
1.94ha
- Activity Area 2a - Higher density living  
5.90ha
- Activity Area 2b - Higher density living / Golf course frontage  
4.07ha
- Activity Area 3 - Medium density living.  
4.44ha
- Activity Area 4 - Lower density living.  
2.77ha
- Activity Area 6 - Commonage.  
8.27ha
- Activity Area 7a - Escarpment.  
10.63ha
- Activity Area 7b - Heritage.  
59.44ha
- Activity Area 9 - Golf activities.  
21.84ha
- Indicative sports field.
- Southern neighborhood.

Activity Area 5a - Woolshed site	0.41ha
Activity Area 5b - Homestead site	1.72ha
Activity Area 8a - Ski Area access & activities	
Activity Area 8b - Ski Area access road	
Activity Area 8c - Carpark area	1.31ha



**DRAFT - 21/11/2016**