



Document Quality Assurance Statement

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1 Executive Summary

Gibbston Valley Station are proposing a new development for fast-tracked approval named 'Gibbston Village', with 900 residential lots, commercial precinct, and primary school. The development site is currently zoned for development and has already obtained a number for consents and engineering approvals in relation to servicing and developing the existing resort zoning.

A significant level of existing servicing and geotechnical reporting already exists for the Site. The increase in density proposed as part of this fast-track approval project for the Gibbston Village will require some variations to these existing consents, and some further detailed engineering solutions, as set out below.

- Earthworks review and update geotechnical reports and apply for variations to existing bulk earthworks consents.
- Stormwater extensive understanding of existing stormwater catchments is known, and need updating for current proposal. Feasible solutions exist.
- Wastewater There is an existing wastewater treatment plant and land disposal area consented with the first stage complete. A newly required land disposal area will need design and consent.
- Water supply existing consents are obtained and could be upgraded if required.
- Network utility services (electricity, telecommunications, and gas) All services are currently onsite and will require upgrading.
- Road Access One access is complete, the other is approved in the current position.
 Intersections will likely need to increase their capacity.

Initial reports show the potential for some effects related to landslides and debris flow in the vicinity of the southernmost parts of Gibbston Commons (AA3, AA7 and AA8). These areas would require further detailed investigation in order to assess potential mitigations to any residual risk. Overall, this affects a relatively small number of allotments compared to the overall Village development proposed.

In summary, there are a range of feasible solutions for servicing of the Gibbston Village which can be designed at the more detailed consenting and engineering approval stages. Given the single land ownership status of the development, and the existing structures in place, this makes for a relatively simple process.

2 Introduction

2.1 Scope

This engineering report has been prepared to support an application for listing of a project within the fast-track approval Bill, named 'Gibbston Village'.

This report provides a preliminary background into the currently approved consents, the infrastructure currently consented or constructed, how the infrastructure can be modified to facilitate the proposed increased intensity progressed under the Fast Track project, and summarising engineering risks.

The level of detail provided within the report is intended to provide the Fast Track Advisory Panel with an overview of the intended strategies and infrastructure capabilities that service the current consented development at Gibbston Valley Station, and how this infrastructure can be modified to accommodate the 'Gibbston Village' fast track project. The report focusses on the following:

- Earthworks
- Stormwater
- Wastewater
- Water supply
- Network utility services (electricity, telecommunications, and gas)

Reticulated stormwater, water supply and wastewater will be owned by a management company or vested in the ownership of the council. In this regard, consultation with the QLDC on 1 May 2024 has been useful to help inform direction on the ownership of services and GVS has provided QLDC a commitment to engage further on this. Electrical power, telecommunications and gas infrastructure will be supplied underground by Aurora Energy, Chorus NZ and Rock Gas NZ respectively, from their existing networks.

2.2 Proposal

The proposed 'Gibbston Village' is located within the existing Gibbston Valley Resort Zone (GVRZ) within the Queenstown Lakes District Council's (QLDC) Proposed District Plan. 'Gibbston Village' proposes to generally utilise the existing development boundaries within the current GVRZ Structure Plan and increase the housing density within each stage, as well as include additional commercial GFA and a school site (Refer Figure 2-1). The Orchard is the only new stage within the proposal and was previously outlined in the GVRZ Structure Plan as Open Space and Recreation Area.

Gibbston Village consists of seven neighbourhoods, which correlate to the activity areas within the existing Resort Zone structure plan (Refer Table 2-1). The 'neighbourhood' names will generally be used within this report.

Gibbston Village 'Neighbourhoods' **Existing Activity Areas** The Vines AA2 The Orchard Open Space and Recreation **Gibbston Commons** AA3, AA6, AA7, AA8 and Open Space and Recreation Vintner's Village AA4 and Open Space and Recreation The Reserve AA5 The Rockery The Rockery **Gibbston Winery** AA1

Table 2-1: 'Neighbourhood' Names for the Gibbston Village Proposal

Figure 2-2 and Figure 2-3 illustrates the proposed overall master plan, which includes:

- 900 residential allotments
- 8,000m² GFA commercial
- 350 student primary school

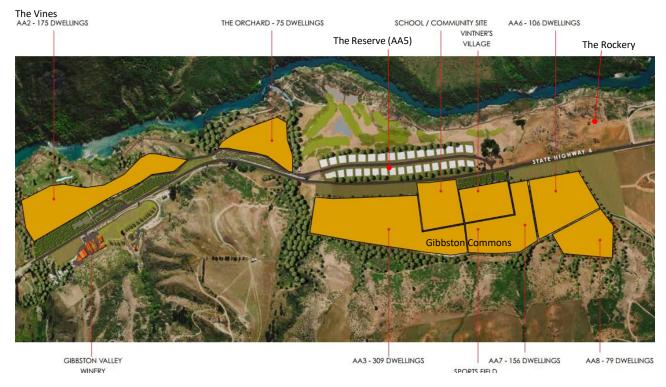


Figure 2-1: Proposed 'Gibbston Village' Stage Boundaries



Figure 2-2: Gibbston Village Master Plan – The Vines & The Orchard (From DCM)



Figure 2-3: Gibbston Village Master Plan – Gibbston Commons & Vintner's Village (From DCM)

2.3 Existing Consents

Table 2-2 is a list of the relevant existing consents relating to the Gibbston Valley Resort Zone. All consents were obtained using the lot yields expected under the current GVRZ Structure Plan, and therefore additional assessment is required to support the increased yields required within this fast-track project. Potential upgrades are discussed in the relevant sections within this report. Figure 2-4, Figure 2-5, Figure 2-6, and Figure 2-7 illustrate the currently approved scheme plans.

Table 2-2: List of Relevant Existing Consents for the Gibbston Valley Station Site

Location	Consent Number	Consent Description	Status
Gibbston Commons & Vintner's Village (AA3, AA4, AA6, AA7 & AA8)	RM080864 as varied by RM220519, as varied by RM230167, as varied by RM230436	Original resource consent for the eastern stages in the Gibbston Valley Station development. The Rockery, The Vines and golf course clubhouse was varied. This consent is still current for the stages Gibbston Commons & Vintner's Village, and approves earthworks in these areas.	Rockery has obtained EA. No detailed design has progressed on Gibbston Commons & Vintner's Village.
Gibbston Winery (AA1)	RM180550 as varied by RM180858, as varied by RM180859, as varied by RM181272, as varied by RM190136, as varied by RM190498, as varied by RM191249, as varied by RM210124, as varied by RM210914	Consents for the vehicle entrance off SH6, underpass, etc at Gibbston Winery	All Gibbston Winery buildings and services are complete. Underpass not constructed yet but almost has EA.
The Vines (AA2)	Land Use: RM201081 as varied by RM220421 Earthworks: RM210129	Activity Area for wine education facility and visitor accommodation. Currently Consented with 98 titles.	Bulk earthworks complete on East side. Some services to stage boundary. EA not applied for yet.
The Vines (AA5)	RM210524 as varied by RM210897,	Land use consent for The Vines. Originally 33 lots. Recent	The Vines - Complete.

The Vines (AA5)	as varied by RM210524, as varied by RM220519, as varied by RM240078 RM210524 as varied by RM210958, as varied by RM220160,	approval is granted for subdividing 4 original lots to 8 duplex lots. EA for AA5, Tom's Creek Road & bridge, The Vines enabling works.	Recent subdivision of 4 lots – construction is underway. Complete.
Water Treatment plant (Tom's Creek)	as varied by RM230686 RM22.054 & BC055241	Interim supply. Water Intake, network, treatment facilities, and storage for Gibbston Valley Wines and Gibbston Valley Resort. Water treated with filtration and chlorination. This is a placeholder until Kawarau River intake and treatment plant constructed.	Construction complete & in operation.
Water intake & treatment (Kawarau George)	RM220392, RM23.870	Long term water source for whole development and GVW. Water Intake, network and treatment facilities to replace Toms Creek supply.	Currently in design and consenting phases.
Wastewater treatment plant & land treatment area	RM220191, and RM21.191.01	Consented Treatment plant and Land treatment area for domestic wastewater and winery facility wastewater.	Stage 1 complete. Modular design that will expand as demand grows.



Figure 2-4: Currently Approved The Vines (AA2) Scheme Plan (RM201881)

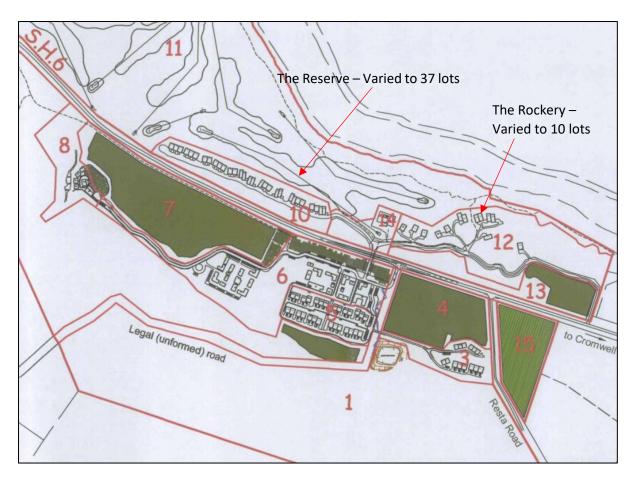


Figure 2-5: Approved Scheme Plan East of Tom's Creek (RM080864, subsequently partially varied)

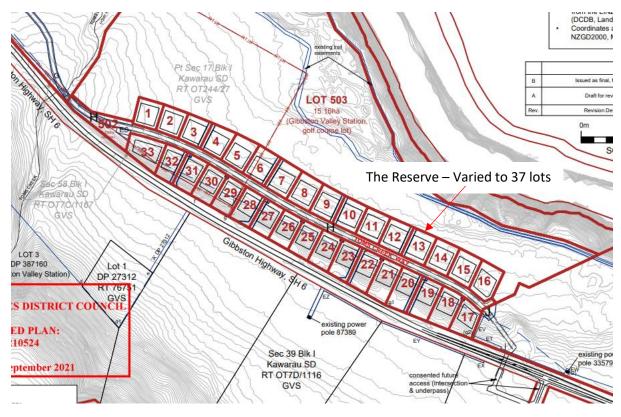


Figure 2-6: The Reserve (AA5) Approved Scheme Plan RM210524 (for reference only. Not within this application area)

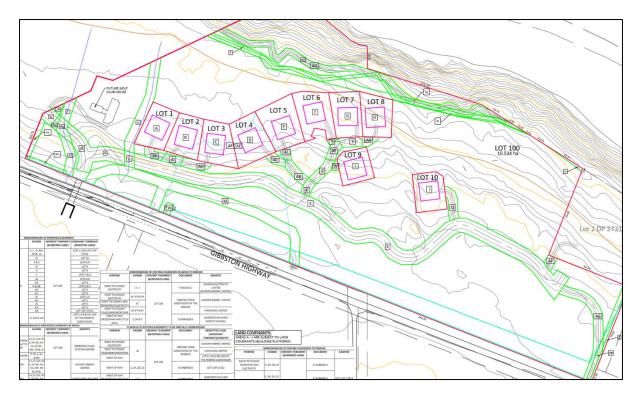


Figure 2-7: The Rockery's Approved Scheme Plan (included for reference only. Not within this application area)

In addition to the approved scheme plans, investigation into a possible development of The Orchard area had begun. To date, no application for a land use consent has been lodged with Queenstown Lakes District Council (QLDC) for The Orchard, however reports outlining the geotechnical design parameters, infrastructure, and flood risk have been referred to in this application to demonstrate that reporting for The Orchard has progressed.

2.4 Completed Works

A number of stages within Gibbston Valley Station are fully complete. This includes:

- a) Gibbston Winery (AA1)
- b) The Vines (AA5), inclusive of the road and services from the SH6 intersection with Vines Way and Tom's Creek Road up to the eastern end of The Vines.

Services that are installed and operating include the following. All services were sized to accommodate the current consented development demands. As-builts of these services are included in Appendix A.

- c) Tom's Creek Water Intake (Interim supply until Kawarau George Intake is completed)
- d) Wastewater Treatment Plant and Land Treatment Area (Stage 1 of 4)
- e) Low Pressure Sewer network from wastewater treatment plant to The Reserve
- f) All services to Gibbston Winery
- g) Potable Water and services along Tom's Creek Road to The Reserve
- h) The 9 hole golf course and club house.

Partially completed works includes:

i) The Vines Bulk earthworks. The eastern half of The Vines is complete. Earthworks on the western side of The Vines is on hold.

3 Earthworks

3.1 Consented Earthworks

Earthworks consents are currently in place for the approved scheme plans as outlined in Table 3-1.

Table 3-1: List of Consented Earthworks Relevant to this Application

Location	Earthworks Description
The Vines	Earthworks was approved to start under RM210129 for the scheme in Figure 2-4. Bulk earthworks for the eastern half of the stage are complete. The proposed The Vines scheme largely matches the layout of the original scheme, therefore the completed bulk earthworks will be largely sufficient and the required modifications to the existing consents will be minimal.
Gibbston Commons (in part) & Vintner's Village (AA3, AA4, AA6, and AA7)	Bulk earthworks for these stages (south of SH6) are approved under RM080864 et al for the scheme in Figure 2-5. An environmental management plan (which include erosion and sediment controls) must be approved by QLDC prior to starting earthworks). The approved earthworks will need to be varied for the proposed modified scheme.
Wastewater Treatment Plant and Land Disposal Area	Preparation of building platforms for the Wastewater treatment plan, and excavation of lines in the Land Disposal Area.
Water intake & treatment (Kawarau George)	Earthworks for the preparation of building platforms, infrastructure, and water storage lakes.

Other areas in GVRZ that have consents to carry out earthworks, however that are not within this proposed development area include:

- the golf course (complete) & The Rockery (RM080864 et al),
- Gibbston Winery (RM180550 et al complete),
- The Vines (RM210524 et al Complete)

The Orchard currently does not have an approved scheme plan and therefore does not currently hold any consent enabling earthworks, other than for the use of the area for stockpile management. A geotechnical site investigation report was prepared by Geosolve for a different scheme plan and will need updating.

3.2 Geotechnical Hazards

The existing geotechnical reports for The Vines & The Orchard show that there are no significant geotechnical risks for these stages that will negatively influence development on these zones.

Tonkin and Taylor prepared a geotechnical report for the Gibbston Commons neighbourhood to support RM080864. The report identified the following low risks:

<u>Landslides:</u>

The toe of a large landslide, known as Resta Road Slide passes through the Gibbston Commons neighbourhood (refer Figure 3-1). The slide is inactive, and is recognised as low risk, however further investigation will be required from a geotechnical engineer to assess the influence of this slip on the proposal and make recommendations on any appropriate measures for the toe of the slope. An assessment will need to be made on whether remedial measures such as shear keys and/or drainage is required to adequately mitigate any remaining risk, or otherwise, whether the location of proposed

lots against the toe of this slope is appropriate or needs modification. The report also notes there are signs of shallow surface landslides all along the steeper slopes.

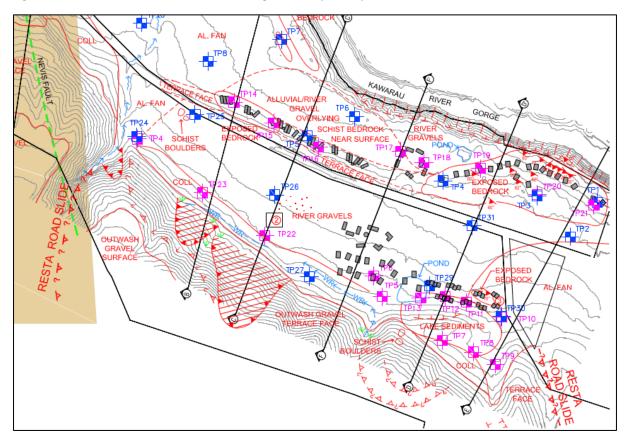


Figure 3-1: Engineering Geological Site Plan Showing Landslide Hazards (Tonkin & Taylor, 2008)

Rockfall:

The slope to the south Gibbston Commons (specifically AA7 and AA8) has a few schist boulders on the slope. The geotechnical report notes that all slopes need to be closely assessed for risk of mobilising of rocks during an earthquake. This risk can be mitigated by removal of any loose rocks or providing appropriate setbacks.

Flooding/Debris Flow

Flood control and protection works will be required through the area (discussed later in the report). Low frequency, high intensity storms may cause a mass of soil and rock to be mobilised down an existing gully or channel. The risk decreases with distance from the mouth of the gully. Debris limits are shown on Figure 3-2.

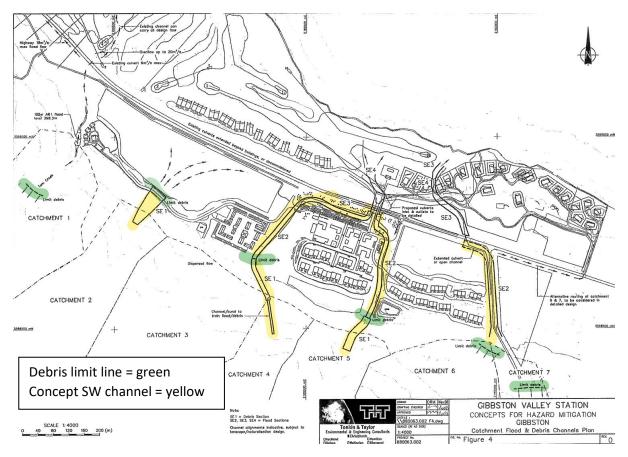


Figure 3-2: Concept Hazard Mitigation, showing debris limits (Tonkin & Taylor 2008 for RM080864)

3.3 Earthworks Conclusion

From the above geotechnical summaries, risk mitigation strategies, and a review of existing granted consents and approvals, we do not foresee any significant constraints to obtaining consents or consent variations for the required Gibbston Village earthworks.

4 Roads and Access

4.1 SH6 Connections

The proposed Gibbston Village development includes two vehicle accesses onto SH6 and two underpasses beneath SH6 (Figure 4-1). The Western intersection (Vines Way) provides access to the northern stages and has already been constructed. The eastern intersection, which is an approved location within RM080864 (et al) but not built, will provide access to the Gibbston Commons, Vintner's Village, and school sites. Assessment of these access locations is discussed in detail in Carriageway Consulting's Transportation Report for the Gibbston Village proposal.

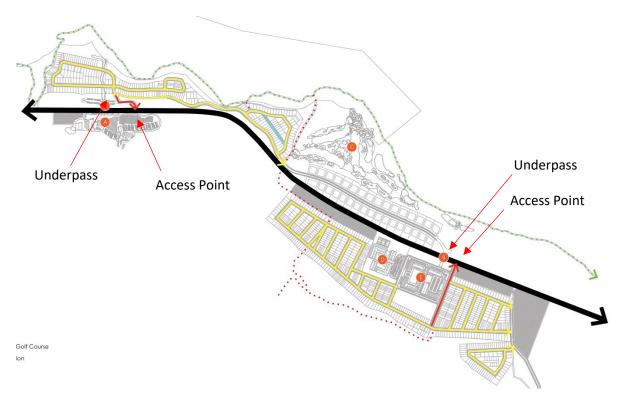


Figure 4-1: Gibbston Village Connectivity Plan (image from DCM's Urban Growth Strategy)

5 Stormwater

5.1 General Management Practices

All existing stormwater networks are designed in accordance with Queenstown Lakes District Council's (QLDC) Land Development and Subdivision Code of Practice (CoP), which requires primary drainage networks to be designed for the 5% Annual Exceedance Probability (AEP) rainfall event (20 year ARI) with secondary flows designed for the 1% AEP (100 year) event. Culverts under SH6 have been designed to convey the 1% AEP (100 year) rainfall event.

Within the existing consents, it is proposed to utilise a low impact design approach. This includes using soakage to ground where possible, road-side swales, downstream defenders, and the occasional feature ponds. When combined, this provides a treatment train approach.

The increase in impermeable areas from the roads and lots result in an increased peak post-development runoff. The QLDC CoP requires, in Section 4.3.5.1 Design storms, that:

"Overland flow downstream discharges of the 1% AEP post-development peak flowrate shall be no greater than the 1% AEP pre-development peak flowrate. The location and type of overland flow downstream discharges are to mimic pre-development scenarios unless otherwise approved by Council. If the pre-development scenario is not mimicked it shall be justified to Council satisfaction why this can't be achieved and why the altered scenario is acceptable."

Existing consents for the Site have justified to QLDC that detention of stormwater to the north of SH6 is not required. This is due to there being no risk to people, property, or stormwater networks downstream of the site.

The peak flows through the Kawarau River are determined by much larger upstream catchments including Lake Wakatipu. These large catchments have a longer time of concentration, meaning their

peak flows will occur well after the peak flows discharging from the development area. Detention ponds have the purpose of maintaining a development's pre-development peak flow rate, but will then release this stored water over a period of time. This will increase the instantaneous peak flows from the development after the storm event, which may then coincide with the later peak flows from the river. Ultimately increasing peak flows through the Kawarau River. It is therefore more advantageous to discharge Site flows quickly into the Kawarau River without detention.

5.2 Gibbston Winery and The Vines

Along Gibbston Valley Winery, on the south side of SH6, GVS has consented and constructed a channel along an unnamed tributary. This channel is dry under normal conditions, but GVS have made a water feature out of this by recirculating water through the channel. This channel also directs overland flow from the upstream catchment through Gibbston Valley Winery, towards SH6, as shown in Figure 5-1. Overland flow then passes through a pedestrian underpass beneath SH6 and into The Vines. The underpass is in the process of obtaining Engineering Acceptance.

The Vines includes a stormwater channel through the centre of the stage as illustrated on Figure 5-2. Water passes through a few ornamental ponds, and into the Kawarau George River.

The proposed Gibbston Village development does not alter the already consented stormwater strategy through The Vines.

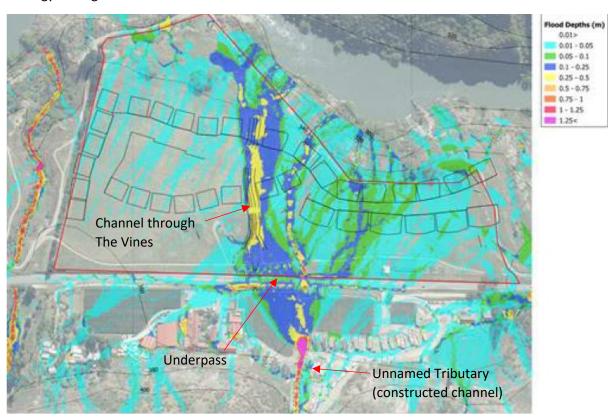


Figure 5-1: Flood Assessment Prepared for the Underpass Consent

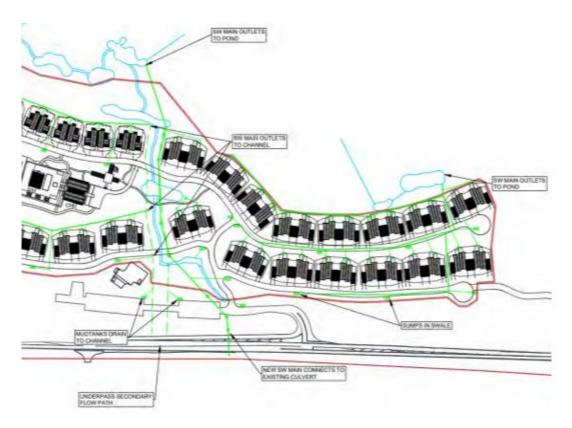


Figure 5-2: Stormwater Channel through The Vines

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5.3 The Orchard

The Orchard is bordered by Tom's Creek along its eastern stage boundary. Tom's Creek is a continuously flowing stream that conveys flows from a large 634-hectare mountainous catchment south of the site. The creek flows in a northern direction, through a 1.2m diameter culvert beneath SH6, under a one lane bridge on Tom's Creek Road, past The Orchard, before discharging into the Kawarau George River.

Crang Civil has analysed Tom's Creek's catchment as part of a flood assessment for a potential previous scheme plan that was not lodged to QLDC for consent. In this assessment, the peak 1% AEP flow was calculated to be 23.5m³/s.

The worst-case scenario assumed the 1.2m diameter culvert was 100% blocked. This scenario resulted in water overtopping the SH6 and heading in three directions as shown in Figure 5-3. Water would flow either west down SH6, re-enter Tom's Creek, or flow along Tom's Creek Road, and past/through The Orchard.

A scenario was also investigated assuming the Tom's Creek culvert under SH6 was upgraded to convey the 1% AEP stream flows. Figure 5-4 demonstrates that all of the 1% AEP flow will remain within Tom's Creek, with some flow passing through the golf course, which would not impact any dwellings.

The Orchard stage of the project will either need to accommodate the 1% AEP flows passing overland through the proposed development, or upgrade the Tom's Creek Culvert under SH6. Both are feasible solutions that can be designed at the detailed engineering stage within the GVS controlled land and no significant risks would remain.

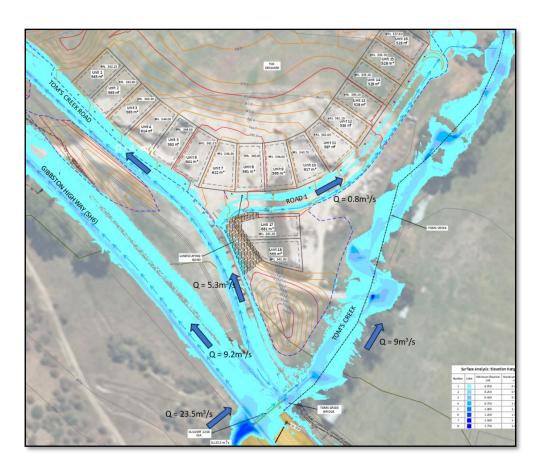


Figure 5-3: The Orchard's 1% AEP Flow Modelling if Tom's Creek Culvert was 100% blocked.

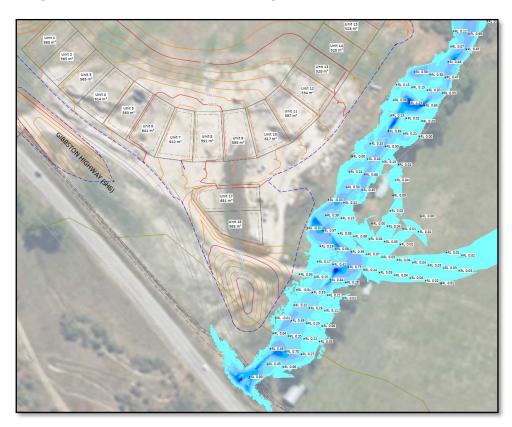


Figure 5-4: The Orchard's 1% AEP Flow Modelling Assuming Tom's Creek Culvert was Upgraded

5.4 Gibbston Commons & Vintner's Village

The stormwater catchments to the south of SH6 are significant in size. Stormwater flows from this catchment have been assessed by Tonkin and Taylor in RM080864, and reassessed by Crang Civil in their Flooding Report for the Rockery s92 application in RM220519. Catchment details are summarised in Table 5-1, and Figure 5-5.

Figure 5-6 illustrates how stormwater interacts with SH6 and directs flows to existing culverts under SH6. A swale has been constructed through Catchment A and B to direct overland flows to the east, and around The Reserve. All existing culverts are undersized and upgrades are proposed across SH6 prior to any construction occurring south of SH6 to accommodate the 1% AEP flows.

Table 5-1: Summary of Catchment Sizes and 1% AEP Flows (Crang Civil, in RM220519)

Catchment	Area	1% AEP Flow
A1 & B1	40.7 ha	1.69 m³/s
С	36.5 ha	1.62 m³/s
D	105 ha	4.08 m³/s
E	9.04 ha	0.52 m³/s
Resta	101 ha	5.32 m³/s
F	0.85 ha	0.05 m ³ /s
G	1.56 ha	0.09 m³/s

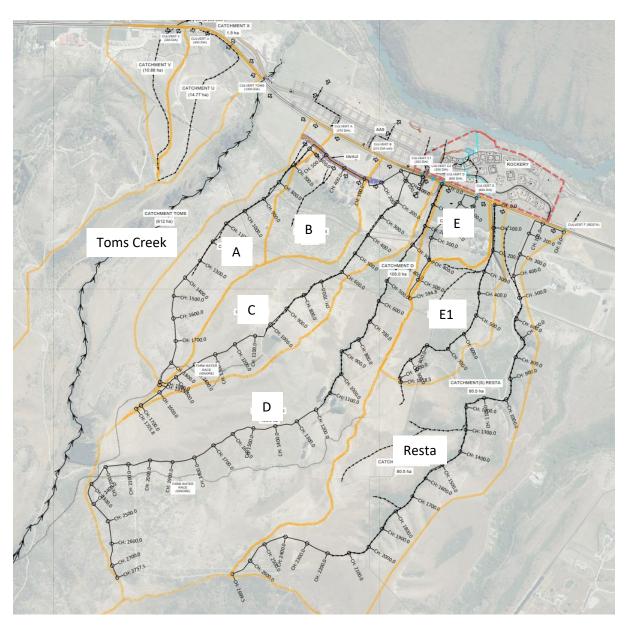


Figure 5-5: Stormwater Catchments (Crang Civil, in RM220519)

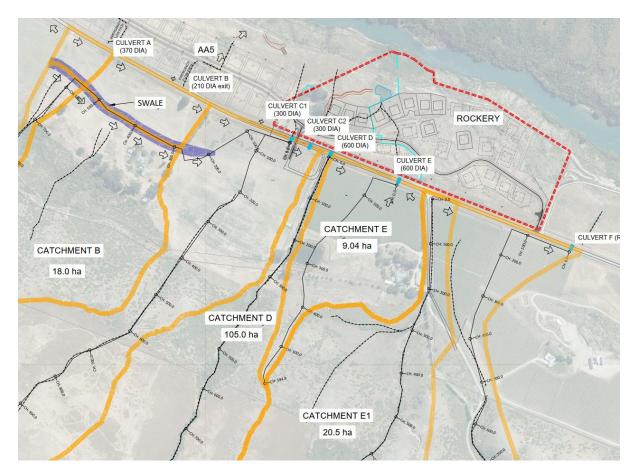


Figure 5-6: Catchment Runoff Interaction with SH6 (Crang Civil, in RM220519)

In Tonkin and Taylor's report and hearing evidence prepared for RM080864, concept hazard mitigation for stormwater flows passing through this area south of SH6 was provided. Four stormwater channels were proposed through the development area (refer Figure 5-7). In addition, willows were to be removed from Tom's Creek, and the stream channel to be reinstated.

The proposed Gibbston Village development significantly increases the number of lots proposed in this area, which will alter the required overland flow path design. A concept plan for managing overland flows is illustrated in Figure 5-8. Proposed management includes controlling smaller overland flows through the road network, and larger overland flows through a channel (not yet shown on the project scheme plan).

Stormwater network through the Rockery has been designed using predevelopment flows from the catchments south of SH6. Therefore, these stages will need to manage their stormwater peak flows before crossing SH6 by providing stormwater detention ponds (dry or wet ponds). Possible locations for ponds are provided in Figure 5-8.

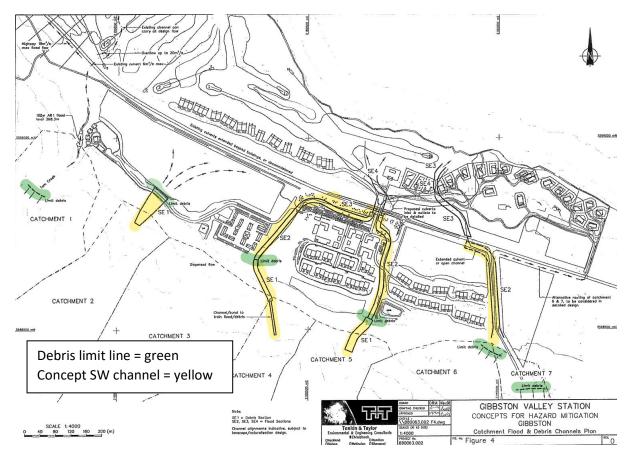


Figure 5-7: Concept Hazard Mitigation (Tonkin and Taylor in RM080864)



Figure 5-8: Preliminary Concept for Stormwater Quantity Management

5.5 The Reserve and The Rockery

The stormwater network within The Reserve development is installed and operating. The Rockery's stormwater network has Engineering Acceptance to proceed but no works have begun at the time of writing this report. Asbuilts for The Reserve's drainage are included in Appendix A.

The Reserve's and The Rockery's reticulated network shown in Figure 5-9 and Figure 5-10 has two functions, conveyance of the 20% AEP rainfall event, and conveyance of 1% AEP overland flows through the site from SH6. In case the pipe network is blocked, secondary flow paths are also provided through the development.

The stormwater in The Reserve is a standalone area. The proposed Gibbston Village development has no impact on The Reserve's stormwater as long as runoff from south of SH6 continues to be diverted around The Reserve, either as currently consented and constructed, or in another approved manner.

Runoff from the proposed Gibbston Village development will not impact The Rockery's infrastructure, provided that peak 1% AEP storm flows are controlled at predevelopment levels on the land to the south of SH6, which may require detention ponds per the concept sketch in Figure 5-8.

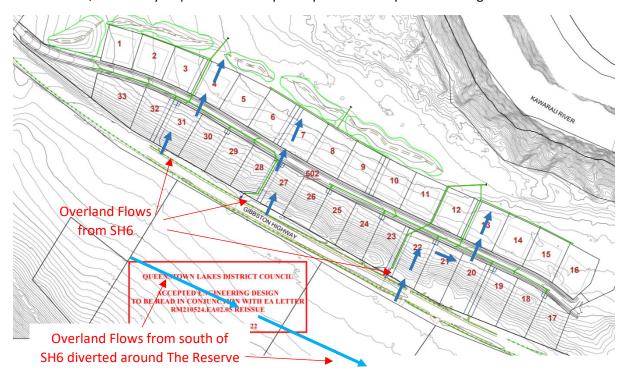


Figure 5-9: Reticulated Stormwater Network and Overland Flows Through The Reserve

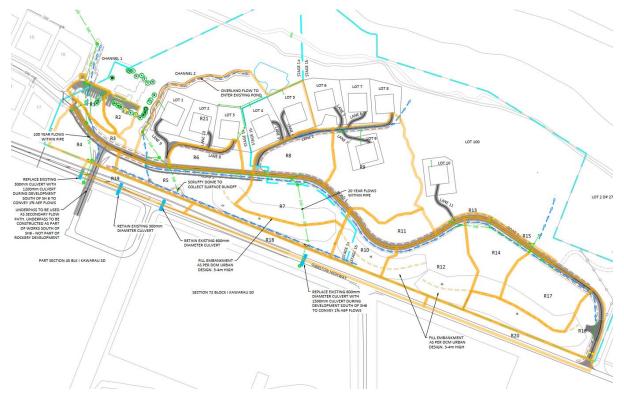


Figure 5-10: Reticulated Stormwater Network and Overland Flows Through the Rockery

6 Wastewater

6.1 Existing Resort Wide Overview

A centralised wastewater treatment plant (WWTP) and Land disposal area (LDA) has been consented to service Gibbston Resort Zone. The WWTP location is centrally located, as shown in Figure 6-1.

The WWTP has been sized to treat and discharge the wastewater generated from all of the originally consented development. The WWTP has been designed to be commissioned in a staged approach, so when expected demand is nearing capacity, expansion can easily occur. Stage 1 of 4 has been completed and commissioned. The related approved ORC Discharge Permit is RM21.191.01, dated 25 November 2021, and a resource consent (RM220191) has been granted by QLDC for the earthworks and utility structures at the WWTP.



Figure 6-1: Proposed Area for Domestic Wastewater Discharge (LEI Ltd, Wastewater Consent Application 6 April 2021, Figure 1.1)

The maximum consented discharge volume from the WWTP and LDA is 338m³/day, whereas the estimated wastewater generated from the existing scheme plan is 215m³/day. The limiting factor for increasing wastewater treatment at the existing WWTP and LDA area is space. The consented LDA (Figure 6-2) has been maximised in the current consented location. Therefore, to service the increased wastewater generated from the proposed development, a new LDA is proposed on the plateau south of Gibbston Commons (refer Figure 6-3). Wastewater demand calculations and soil tests will be required to determine the size and suitability of the proposed LDA location.

A decision has not yet been made for whether it is more economical to install a second WWTP at the new LDA area, or to upgrade the existing WWTP for the increased flows and pump raw wastewater from the eastern stages to the WWTP then pump treated wastewater back to the new LDA area. Either solution can feasibility be constructed within GVS development land and would sufficiently mitigate any residual risk.

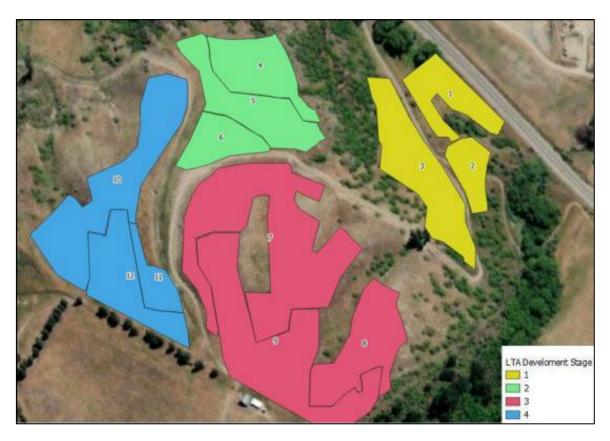


Figure 6-2: Consented Land Treatment Development Areas

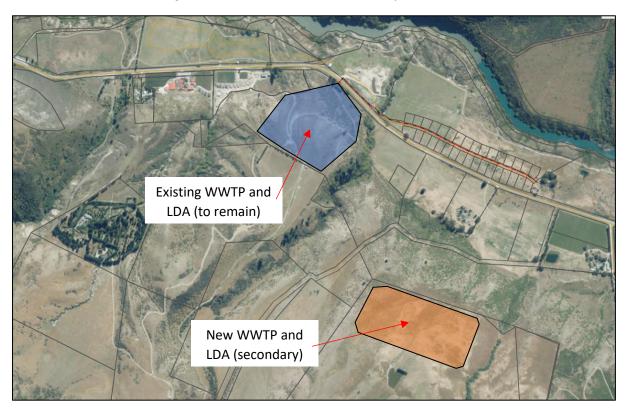


Figure 6-3: Proposed secondary WWTP and LDA

6.2 Wastewater Reticulation

A low-pressure sewer (LPS) reticulation network currently services the completed Gibbston Valley Station, as designed by Ecoflow. The LPS network was designed to service all stages to the north of SH6 for the currently consented scheme plan.

LPS systems require each lot to have their own private wastewater grinder pump and storage. With the increased intensity of proposed buildings, LPS may no longer be the most suitable solution for The Vines or the Gibbston Commons and Vintner's Village neighbourhoods. Instead, a standard gravity network with centralised pump stations within the development area, such as reserves, can be provided to service those stages.

7 Water Supply

7.1 Resort Wide Overview

GVS currently provides potable and firefighting water supply to its developments through an infrastructure management entity, Gibbston Valley Resort Infrastructure Ltd (GVRIL). Initial consultation with the QLDC was held on 1 May 2024 to start engagement on the ongoing ownership of infrastructure.

At present, GVS has an Otago Regional Council water take consent to take water from Tom's Creek (RM22.054) for use as potable water supply. This intake is currently operational and supplies all GVS's completed stages.

GVS also has consented a water intake from Kawarau River and treatment system at the western end of the Gibbston Valley Resort zone to service the current fully consented scheme with some buffer capacity. The existing consent (RM23.635.01) allows for a maximum take of 100l/s up to 1,000,000 litres per day (1000m³/day). Once this Kawarau River intake is operational, the existing Tom's Creek intake would be retained but used as a backup emergency supply.

Current consents for the Kawarau River intake and treatment system are:

- ORC certificate of compliance to take water from the Kawarau River: RM23.635.
- QLDC land use consent for infrastructure in PL1 area RM201081
- ORC Application for water intake station in train RM23.639.

Figure 7-1 shows the location of the existing Tom's Creek water take, and Kawarau water intake.

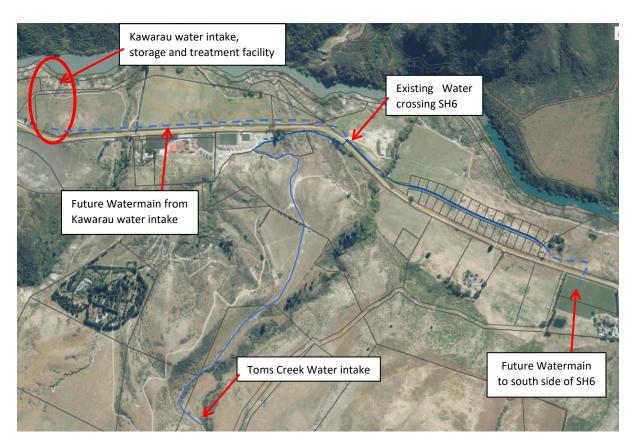


Figure 7-1: Kawarau River and Toms Creek water supply and reticulation locations

The currently proposed Kawarau water intake plant is designed for the following parameters once at full operation.

- An estimated peak daily potable demand 395m³ a day and irrigation demand 570m³ a day
- Raw water storage pond 1495m³
- Treated water plant capacity to treat 965m³/day
- Treated Water Storage: 700m³

Each of these parameters will be evaluated at the detailed consenting stage of the Gibbston Village proposal and will be varied to suit if required. The infrastructure for the water intake, storage and treatment can be expanded as required. The water take consent may also need to be varied for the increased demand.

7.2 Internal Reticulation

The existing watermain that distributes water through The Reserve has been sized to distribute water to the south side of SH6 for the currently estimated water demand. The new proposal will increase water demand. To maintain water flows and adequate working pressure to the south side of SH6, there are multiple options that can be explored. Possible options include installing duplicate water lines, installing a new watermain across SH6 closer to the Kawarau Water treatment plant and loop the watermain to the existing watermain to create, and/or booster pumps with water storage sites. Given the land is solely under control of GVS, these solutions would be readily available and feasible.

Irrigation to each lot is from the potable water supply laterals to the residential lots. There is no separate irrigation supply network proposed for the lots.

7.3 Firefighting Supply

In accordance with SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of practice, the full development will be designed to provide adequate pressure and flow rate for the appropriate FW classification for each building throughout the proposed development.

8 Network Utility Services

8.1 Electricity Power Supply

Aurora has an existing distribution network for electricity supply in the GVRZ. To service the proposed development, it is assumed that the existing distribution network could be modified by upgrades to transformers. Aurora will be approached to confirm there is sufficient capacity to service the development.

Easements (in gross) will be provided for underground electricity supplies, benefitting Aurora Energy Ltd.

8.2 Telecommunications Supply

There is an existing network for fibre telecommunications in the GVRZ. The existing network will be extended to service the proposed development. Chorus will be approached to confirm there is sufficient capacity to service the proposed development.

Easements (in gross) will be provided for underground electricity supplies, benefitting Chorus NZ Ltd.

8.3 Gas Supply

A gas pipe network is provided and operated within GVRZ. This network is supplied by a centralised gas storage structure. The gas network is operated by Rock Gas and will be extended as required to suit the proposed development.

	 	 	 -
END.			

Easements (in gross) will be provided benefitting Rock Gas Ltd.

APPENDIX A:
SERVICES AND UTILITIES ASBUILTS





