APPENDIX J

Stormwater Assessment

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Prebbleton District Plan Change Application

Servicing Report

M and N Coffey and William Blake Ltd

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Contents

1. Introduction

1.1 General

M and N Coffey and William Blake Ltd have engaged Connell Wagner to undertake a servicing feasibility study to support their application for a change to the Selwyn District Plan. The proposal will see the re-zoning of Part Lot 4 DP24908 (9.1940 ha), Lot 105 DP331951 (8.4515 ha) and Lot 4 DP8147 (1.2131ha), combined area of 18.8586 ha of rural land west of Prebbleton township for residential development purposes. Refer to the locality plan in ***Appendix A***.

This report investigates the following servicing issues:

- Wastewater Disposal
- Stormwater Management
- Water Supply

Information has been drawn from the Selwyn District Council (SDC), site investigations and experience gained from recent developments on neighbouring land.

1.2 Background

Preliminary site investigation work was undertaken by Connell Wagner during August 2007. The investigation included a site walkover, a topographic survey and subsurface geotechnical investigation.

General Layout
The site is irregular shaped and becomes narrower in the north. It is orientated in a northeast-southwest direction.

The site is bounded to the northeast by Blakes Road, to the east and south east by residential areas and to north and southwest by trees and pasture.

Access to site is via Cairnbrae Drive in the south east or via Blakes Road in the northeast.

Existing Use
The site is covered with grass and is currently used for grazing. A dry watercourse, previously used to convey irrigation water is located between the two properties. A small area of fill is located at the termination of Cairnbrae Drive.

Refer to ***Appendix E*** for site photographs.

Topography

The site is relatively flat with a slight fall towards the south east. The general grade of the site is approximately 0.5% (1:200).

Geotechnical Investigation

A geotechnical investigation was carried out on the site in early September 2007. The investigation included a walk over and test pitting in key locations to provide information on the underlying soil conditions. The geotechnical report has been included as ***Appendix B***. A summary of the results is as follows:

The following geological model has been inferred for the centre of the site:

- 300mm Topsoil overlying,
- 1700mm to 2000mm of Sandy SILT overlying,
- Sandy GRAVEL to depth

The following geological model has been inferred for the northern part of the site:

- 200mm Topsoil overlying,
- 2000mm Sandy SILT overlying,
- Silty SAND to depth

Groundwater

Well logs from the Environment Canterbury (ECan) database indicate that the depth to groundwater in the Prebbleton area is approximately 5m – 6m. This depth is expected to vary seasonally and annually.

The proposed rezoning area does not fall within the Christchurch Groundwater Recharge Zone.

Distance to Existing Wells

The nearest community supply well (M36/7504 - CRC050497) is approximately 530m across the peizometric contour gradient as described by the ECan database. Another community water supply well (M36/0870 - CRC010900) is approximately 915m south east (down peizometric gradient) of the site.

Both of the community supply bores are greater than 30m in depth, therefore the site does not currently fall within a theoretical Community Drinking Water Supply Protection Zone when plotted in accordance with the Proposed Natural Resources Regional Plan (PNRRP).

The proposed development currently has separation distances greater than 50m in the expected direction of groundwater flow from any known legally established existing wells. A separation distance of 50m between existing private wells and discharges to ground is generally used by ECan to trigger additional resource consent requirements.

2. Sewerage Reticulation

2.1 Outline Development Plan Servicing

Prebbleton has 906 permitted sewer connections which discharge to the CCC sewerage reticulation. These connections have all been allocated therefore this scheme is therefore effectively closed to further connections.

The SDC is in the process of developing and adopting a Wastewater Strategy for Prebbleton and other surrounding smaller townships within its District.

2.2 Design Flows

The proposed plan change includes re-zoning the area to cater for approximately 210 residential properties.

The Christchurch City Council Infrastructure Design Standard (Draft 2007) sets the following minimum design criteria for the design of sewerage reticulation.

Table 1 - Sewage Design Flows

Residential Sewer flows	220 l/s
Assuming population per lot	2.7 Persons/Lot
Total Lots	210 Lots
Peak to average ratio	2.5
Dilution from infiltration and inflow ratio	2.0

Average Sewer Flow *=210 Lots x 2.7 Persons/Lot x 220 l/s/Person*
=124,740 l/day
=1.44 l/s

Maximum Sewer Flow *=1.44 l/s x 2.5 x 2.0*
=7.22 l/s

The development area has three possible connection points, being William Street, Cairnbrae Drive and the Warratah Park subdivision, to the existing SDC reticulated sewer system. SDC have indicated that a new sewerage pump station to convey sewage to the Rolleston sewage treatment plant is likely to be located near Trents Road.

2.3 Physical Constraints

A preliminary reticulation plan has been prepared based on the proposed road layout for the area. A topographic survey of the site was undertaken and preliminary road levels estimated with consideration to sewage disposal.

The design criteria used in developing the sewer plan were:

- 1 in 250 grade for 225 dia mains
- 1 in 160 grade for 150mm dia mains
- 1 in 100 minimum grade for 100mm dia laterals

The preliminary sewerage layout is detailed in the Preliminary Service Plan included in ***Appendix C***.

Assuming the topography of the site remains relatively unchanged following development, the subdivision can be serviced under gravity provided a trunk pipe is laid along the eastern boundary of

the development area. For the purposes of determining the gravity sewer layout, it has been assumed that the development can connect to William Street, Cairnbrae Drive and Warratah Park.

Following detailed design and confirmation of sewage pipe easements, some sections to the east of the site may be required to pump sewage from a holding tank to enter the gravity sewage reticulation.

2.4 Staging of construction

It should be noted that if development is only undertaken on the William Blake Limited land or if this land is developed before the Coffey land, the proposed wastewater reticulation network will need to enable connection to the existing SDC reticulation network on Cairnbrae Drive or in the Warratah Park subdivision. This may require the construction of a wastewater pumping station, or for easements through the Coffey land for the extension of gravity sewer reticulation.

2.5 Additional Infrastructure Requirements

Given the relatively small scale of the proposed development and the way in which it must be serviced by three different connections, it is not expected that upgrades to existing infrastructure will be required.

2.6 Conclusions

SDC have indicated that sewage from additional developments within Prebbleton will be directed to the Rolleston sewage treatment plant. This will be via a new sewage pumping station to be located on Trents Road.

From preliminary calculations, the development can be serviced under gravity although following finalised design some sections on the eastern boundary may be required to pump sewage in order to enter the Prebbleton sewage reticulation.

Consideration needs to be given to the staging of construction to enable the developments to be serviced with gravity sewage reticulation. This could require cooperation between the two developers.