Resource Management Act 1991

Proposed Plan Change 7
To the Selwyn District Plan

Supplementary Report on Servicing

To:	Hearings Panel
From:	Hugh Blake-Manson, Selwyn District Council
Date:	13 June 2011

Note: ***The recommendations contained within this report do not constitute Council decisions until accepted.***

This report has been prepared under Section 42A of the Resource Management Act 1991. The purpose of the report is to assist Selwyn District Council's Hearing Commissioners to evaluate and decide on submissions on provisions in Proposed Plan Change 7 to the partially operative Selwyn District Plan by providing expert advice on technical matters. The report does not make recommendations on submissions but the information and conclusions contained within it may be used by planning officers as a basis for making recommendations on submissions. This report should be read in conjunction with the planning officer's report and any other relevant reports identified.

1. Introduction

1.1 My name is Hugh Maxwell Blake-Manson. I am the Asset Manager Utilities for Selwyn District Council. I have been asked to prepare a supplementary report commenting on servicing-related matters arising from the Commissioners Minute (dated 24 May 2011) on Proposed Plan Change 7 (PC7) to the partially operative District Plan (District Plan).

1.2 My qualifications and experience have been set out in my original s42A report, dated 9 March 2011.

2. Report Content

2.1 The following topics are discussed in this report pertaining to the submissions referred to in the Commissioners Minute in relation to Utilities infrastructure aspects.

Principles for Provision of Utilities Infrastructure

Potential Liquefaction and Groundwater Issues

Rezoning requests

- Denwood Trustees, Lincoln
- Branthwaite Drive, Rolleston (Living Z)
- Branthwaite Drive, Rolleston (Interim Zoning)
- Helpet Park, Rolleston
- 620 East Maddisons Road, Rolleston

3. Principles for Provision of Utilities Infrastructure

3.1 For the purposes of this evidence, Utilities are considered to be:

- Community water supplies [1]

[1] Water taken primarily for group drinking water supply of community drinking water supply (500 people for >60 days/year) but that may also be used for other purposes such as to supply institutional, industrial, processing, stockwater or amenity irrigation use and fire-fighting (operative NRRP 11 June 2011).

- Sewage (wastewater) schemes
- Land Drainage schemes
- Stormwater treatment and disposal schemes and
- Waterrace schemes

3.2 Council's Utilities services are provided for the benefit of achieving the respective communities outcomes. This means that Council should focus on efficient and effective:

i) Utilisation of existing infrastructure; and

ii) positioning and construction of new capital infrastructure e.g. water wells and headworks, sewerage pumpstation wet wells, stormwater treatment and disposal areas.

at the same time accounting for:

iii) Lifecycle costs i.e.

- Operations and maintenance – repair to ensure the condition is maintained
- Renewal (replacement to the standard as designed and specified by current Codes of Practice and legislation)

3.3 Council has a 60 year strategic view[2] on delivery of Utilities. This is generally in line with the useful life[3] in which significant assets should remain at an appropriate condition to continue providing the service for which they were intended. Significant assets also have high capital costs eg. sewerage pumpstations $150,000 and sewage rising mains $700/metre.

3.4 Significant assets for Utilities include:

- Terminal sewerage pumpstations
- Rising pressure sewerage mains and water mains respectively
- Treatment and disposal systems above sensitive catchments. This includes urban stormwater feeding into lowland drainage – Te Waihora/Lake Ellesmere.

3.5 Through a detailed focus on criticality[4] Council has prioritised the inspection regimes response times, and timing of renewal works required on its utilities. This includes significant assets. For example, the likelihood of well designed, constructed and maintained sewerage rising mains failing is low, but the consequence if this occurred such as discharge to the environment and people can be extreme.

3.6 Assets nearing the end of their useful life require progressively greater investment by Council and the community specifically in the areas of:

[2] 5Waters Strategy as adopted by Council 26 August 2009

[3] Useful life is determined by the assets material quality, the aggressiveness of environment it is installed in and demand on it e.g. a sewerage pumpstation structure should last 75 years if well constructed with no extra growth and normal sewage.

[4] Criticality an assessment of the consequence of failure relative to council's assets. Risk is a function of consequence and failure likelihood.

- Inspection/monitoring – as the probability of failures increases
- Repairs – due to wear and tear, resulting in higher maintenance costs
- Replacement – design, tendering, installation and commissioning. This is significantly more expensive if the assets e.g. pumpstation is a critical (non-duplicated) item.

Summary

3.7 Council is prudent in the method and manner which it times, locates, designs, installs and maintains its Utilities assets. It must be mindful of the cost burden on current and future users.

4. Potential Liquefaction and Groundwater Issues

4.1 Being mindful of the future growth areas, it is my opinion that areas with known or reasonably predicted adverse physical issues should only be developed after prudent assessment of their overall risks has been completed.

4.2 I am particularly referring to the risks associated with construction of urban infrastructure including dwellings being installed in areas of known or possible:

i) High ground water table – lowland groundwater springs interface drainage areas

ii) Liquefaction areas

4.3 I have read Mr Ian McCahon's evidence in relation to a preliminary assessment of the liquefaction potential of the subject areas. He states that the potential for liquefaction in Rolleston is low.

4.4 With respect to Lincoln in **paragraph 9 (e) of Mr McCahon evidence** he notes the uncertainty of liquefaction potential in the area to the west of Springs Road, but indicates that there is "some possible potential"

4.5 In **paragraph 16 of Mr McCahon's evidence** he states that the liquefaction hazard must be investigated as part of the subdivision geotechnical reporting. My opinion is that this is too late in the rezoning process, and instead this should be completed as a core requirement of PC7 land rezoning. I accept that the risk of liquefaction can be "engineered out" to a degree as can mitigation of groundwater, allowing for land development to occur. However there is an incremental or potentially substantial cost to providing stable dwelling platforms and ancillary services with these particular physical issues.

4.6 I appreciate that this is may be considered to be at odds to Mr Woods earlier evidence, essentially supporting Mr McCahon's statement. However my concerns arise from direct experience with subdivision approvals, where the property owner considers that the zoning

reflects acceptance that matters such as land stability risks have already been dealt with satisfactorily. This is not always the case, and Council is a weaker position to defend future land owners expectations for suitable stable land to build on. This also applies to suitable stable utilities services.

4.7 I will elaborate further on groundwater matters as part of the particular land areas supplementary evidence is provided on.

5. Denwood Trustees, Lincoln

Water and Sewerage Servicing

5.1 **At paragraph 12 of his evidence Mr Dasler** states that any growth limitations for Lincoln will be lifted once upgrades at Rolleston's Pines sewage treatment and disposal site and the Lincoln – Rolleston pumped rising main are completed.

5.2 These statements are not based on the most current Council information.

5.3 The Pines Rolleston Sewage Treatment Plant is to be designed and constructed in modular stages. The critical modules will be bioreactors to be constructed in 15,000 PE units[5], with 30,000 PE in the first stage. That plant will immediately take 20,000 PE from contributing townships and 7,000 PE from Rolleston. The remainder of the capacity is expected to be taken up by Eastern Selwyn township growth. It is appropriate to take a modular staged approach to treatment plant capital works. This allows Council to better match very high construction costs and their timing with growth. In effect it is councils intention to provide additional treatment capacity on a "just in time" basis.

5.4 This current Pines work is estimated to cost $28.9m and be undertaken by September 2012.

5.5 Council is also planning to install a single pressure rising main pipe from Lincoln to Rolleston. Its preferred location is via the future extension of Southfield Drive in the Lincoln Land Development property to Springs Road, approximately 150m away from the northern corner of the Denwood block. From there on it would be installed in road reserve to the Pines. A pumpstation at the intersection of Selwyn and Springston-Rolleston Roads is required.

5.6 The cost of this pressure rising main and pumpstation to the Pines is estimated at $17.5m and is required by September 2012.

5.7 Council will **not** permit direct access into this pressure rising main. This single main has a high criticality rating, and it must be preserved for the sole function of transferring Lincoln and environs sewage to Rolleston.

[5] PE= population equivalent – generally established as the biological and volumetric load of a person in a dwelling

5.8 **At paragraph 18 Mr Dasler** identifies five options for sewage disposal from Denwood. One option identified is not available , as I have explained above. Alternative options all require a long single pressure rising main to the nearest appropriate point in the existing sewerage scheme.

5.9 I note that the Lincoln University sewerage pipe to Marion Place has been recorded as reaching full pipe capacity at times of high rainfall. Therefore additional connections to this point in the sewerage network is not available.

5.10 My assessment is the nearest sewerage network point (Gerald Street) available for Denwood via road reserve is 1.27 kilometres distance from northern boundary of the property.

5.11 It is also 1.27 kilometres to the nearest community water pipe form the Denwood property boundary. The water and sewerage services are therefore orphan services, with no benefit other than for the Denwood Trustees proposed development.

5.12 Mr Dasler also identifies a requirement for two pumpstations **at paragraph 23 of his evidence**. The nearest one is located approximately 520 metres from the north boundary on Springs Road. He explains in **paragraph 24 of his evidence** that deep gravity lines are technically difficult and problematic.

5.13 I agree with this assessment of technical and operation difficulty, as based on my knowledge groundwater and spring water rise to ground level from time to time in land immediately adjacent – east and west. I do not expect the majority of the Denwood land to be any different from adjacent properties in this matter.

Stormwater

5.14 I have read **Mr Andrew Brough's evidence** and accept that stormwater on this site may only practically be treated via a surface base detention system, then discharged to the land drainage network.

5.15 I note that any proposal to discharge to the L2 and hence Te Waihora/Lake Ellesmere system will be subject to rigorous requirements by Council. This is because of the need to maintain capacity in the L2 for existing groundwater and stormwater discharges, and ensure water quality is incrementally improved prior to discharge in the Te Waihora/L2.

Summary

5.16 Three options for development of the Denwood Trustees land have been tabled. Option 3, tabled by the commissioners identifies:

- Living Z Deferred - 13 hectares, and
- Business 2 - 13.4 hectares.

5.17 It is my opinion that a variation of Option 3 – being deferral of Living Z and Business land

occur. This should be deferred until applicable barriers to sewerage scheme access, stormwater treatment requirements and uncertainty regarding liquefaction potential are resolved.

6. Branthwaite Drive, Rolleston (Living Z)

Stormwater Servicing

6.1 I note that stormwater may be disposed of to ground across Rolleston subject to the necessary consents, subdivision guidelines and Engineering Code of Practice being .

Master Service Planning – Rolleston Sewerage

6.2 I have identified the estimated cost (paragraph 23) of providing pumped rising main and pumpstation infrastructure.

6.3 In addition to this infrastructure, council expects to provide core off-site township trunk sewerage infrastructure to support PC 7 sequencing. A draft master servicing plan has been prepared for Rolleston to support this.

6.4 Council expects to install a trunk gravity sewerage main along Springston-Rolleston Road between Lowes Road and Selwyn Road. At approximately 2.85 kilometres and located in the road centreline it is estimated to cost $1.6m or $575 per lineal metre.

6.5 The trunk gravity pipe has been positioned at a depth, diameter and grade to meet the following constraints:

i) Application of appropriate engineering principles – efficiency and effectiveness

ii) Provide for direct connection of upstream gravity mains

iii) Ensure an economically feasible terminal pumpstation depth at Selwyn Road

iv) Provide for minimum grades and technically appropriate catchment servicing zones. In this area a pipe grade of 1:400 with minimum pipe cover of 1.2m and a gravity serviceable area of 650m either side[6] of the pipe has been allowed for.

6.6 The actual gravity serviceable area will be subject to survey.

6.7 The trunk gravity main is expected to be installed by the end of 2012. It is intended to collect sewage from development eventually expected at/adjacent to Springston-Rolleston Road.

6.8 I have referred to off-site trunk infrastructure in paragraph 37. In my Utilities S42a report, I also covered how on-site infrastructure is provided. Further explanation is provided as follows, specific to this matter.

[6] Between Springston –Rolleston and Lincoln-Rolleston - Lowes Road – 620m, parallel to Branthwaite Drive entrance – 1210m

6.9 It should be noted that on-site infrastructure has historically received funding, planning and construction input to varying degrees by Council. While situation dependant, Council's approach is to ensure that infrastructure is provided to meet outline development plan requirements.

6.10 Council will as a result of supporting on-site infrastructure incur costs, which it debt funds. It then seeks to ensure any costs associated with catering for growth beyond the development area are recovered.

6.11 I acknowledge that off-site infrastructure makes up the majority of Council debt funded costs. Regardless of the proportion of on-site/off-site costs, each funding commitment represents an increase in the Councils debt-burden.

6.12 While Council continues to be prepared to assess and take a role in on-site infrastructure, its role as 'banker' represents a risk. It is investing in infrastructure on behalf of future developers. That risk is realised if development does not occur, or if it occurs at a slower rate than anticipated.

6.13 The extent of land available and its predicted rate of uptake is covered by Mr Cameron Woods evidence. It is also reflected in the Rolleston Structure Plan. Council relies on a minimum uptake rates being achieved, to fund the debts incurred.

6.14 Developers have been supportive of Council in its role as banker, however in accepting the associated risks Council it should be able to directly control where and when that development occurs. In doing so it is acting prudently on behalf of existing ratepayers.

7. Branthwaite Drive, Rolleston (Interim Zoning)

7.1 I understand that a request for interim subdivision has been made. I have been advised by Mr Wood that this request would ultimately result in the creation of 30 additional lots, taking the total number of lots in this area to 54 x 2 hectare lots.

7.2 I have the following specific concerns, noting my earlier statements regarding on-site servicing and efficient and effective servicing requirements:

<u>Water</u>

7.3 Water is available to this area, via an extension and upgrade to the existing Rolleston network. On-site infrastructure would require upgrades, to provide the capacity required for servicing lots. All new connections would require water meters and be subject to contributions, rates and charges. Existing connections via the Branthwaite Drive well would at least be subject to Rolleston water fees and charges.

7.4 For clarity, agreement to provide interim zoning would trigger the abandonment of the existing Branthwaite Drive well and headworks as the more efficient long term approach is to

utilise the larger capacity

Sewerage

7.5 By my calculations it would cost $1.2m to provide Council reticulated sewerage services referred to as on-site works. Assuming ultimate densities, only 3% of the total connections would have been made through interim development (54/2137), which utilise the network installed to meet ultimate densities.

7.6 It is not efficient nor effective for Council to fund this on-site work at the estimated cost and prior to the proposed deferral period being lifted from 2021.

7.7 **At paragraph 23 of her evidence** Fiona Aston states that individual property sewerage systems are appropriate and infers that these are more robust than the "low level of resilience inherent in centralised wastewater treatment systems" in the event of an earthquake.

7.8 My direct experience is contrary to Fiona Aston's statements. While the Rolleston sewage treatment plant suffered minor structural damage in the September 4th 2010 earthquake, it was quickly repaired. No damage to this treatment plant was recorded after the February 22nd 2011 event. At the same time council staff recorded and responded to failures of private property sewerage systems and water wells in similar ground conditions to those in the Branthwaite Drive area.

7.9 Centralised sewerage services Selwyn – have proven to be very robust and resilient in my opinion.

7.10 I understand that 2 hectares lots could individually install private property sewerage systems, however such systems would ultimately need to be replaced by reticulated services post 2021. In addition some existing systems may require relocation where they encroach on new boundaries. New private property based sewerage systems have capital costs of approximately $12,000-15,000, excluding maintenance and repairs. I note that this is subject to Regional Council approval.

7.11 The operative Natural Resources Regional Plan Rule WQL9 – "Discharge of contaminants in to land from an on-site wastewater system" identifies the general and specific conditions for new and existing on-site wastewater systems. It notes that as long as the network providers agrees, connection to an available reticulated sewerage network must be made by a property within:

- A boundary within 30 metres of the network or;
- A dwelling within 60 metres of the network

7.12 Council is not likely to permit individual lot connections to this main from any Branthwaite properties within the stated area. However, I have already noted that Council will support

on-site reticulated works where they are efficient and effective. This support is particularly provided when development occurs on the ultimate density basis.

7.13 Allowing for individual uncoordinated, low density connections as a short term alternative to provision of on-site infrastructure is in my opinion very poor use of resources.

Summary

7.14 In my opinion neither option for servicing 2ha interim development (i.e. Council funded servicing or interim private servicing) is appropriate as:

i) Investment in private on property systems which would be abandoned after 2021 is not economically sensible.

ii) Council would not invest in on-site reticulated infrastructure given current poor return and utilisation.

iii) There are many other locations in Rolleston that could provide more suitable land to meet growth predictions as an alternative to the interim development of Branthwaite Drive

7.15 If the Commissioners are of a mind to allow interim development, then development should allow for and install at its costs utilities infrastructure required for the ultimate density development. Other contributions, fees and changes would also arise as a result of this decision.

8. Helpet Park, Rolleston

8.1 I have outlined reasons for on-site Council funded infrastructure.

8.2 In the case of Helpet Park, a request for rezoning to 240 households from 2021 has been made. This is dependant in existing dwellings being suitably located, and landowners choosing to develop.

8.3 The majority of this land will have access to the Springston – Rolleston sewage trunk main (gravity).

8.4 In my opinion it is sufficiently compact that efficient and effective on-site services could be provided. A small part of the sewerage infrastructure will need to reticulate to Lincoln – Rolleston Road and then be pumped to the nearest gravity main, most likely on Lowes Road. Survey will be necessary to confirm this.

8.5 At this time water supply is also available and Council has a programme in place to progressively install new wells and headworks to meet demand on a just in time basis.

Summary

8.6 I consider that there are no significant infrastructure issues in developing this land after 2021.

9. 620 East Maddisons Road, Rolleston

9.1 I understand that a request has been made to rezone 620 Maddisons Road, providing 200-300 lots, after 2021.

9.2 Council has no community water or sewerage services in this area. It is not planning to install these services until after 2021 given the:

i) Need for a pumped rising sewage main

ii) Extension of community water services

9.3 For the reason previously explained Council expects efficient and effective provision of off-site and on-site utilities. These standards would not be met unless development around this area occurred.

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