



## **Officers Report**

### **Appendix 8**

### **WDC Three Waters Technical Report**

## Technical Experts Report on Amendments Sought Through Submissions

<b>Date</b>	16 March 2016
<b>From</b>	Kalley Simpson, WDC 3 Waters Manager
<b>Subject</b>	3 Waters Servicing, including Water Supply, Wastewater and Stormwater

### Qualifications and experience

1. My name is Kalley Simpson and I am the 3 Waters Manager for the Waimakariri District Council (WDC). In this position I have responsibility for the water supply, wastewater and drainage assets for the Council.
2. I hold a Degree in Natural Resources Engineering from the University of Canterbury and have 16 years of experience in civil engineering. This experience includes the investigation, design and management of 3 water network systems.

### Summary of submissions

3. The following submissions have been made relating to 3 Waters servicing:
  - Clayton Cook (Resident) – promoted the use of a composting toilet as part of the campervan park.
  - Tom Bayliss (Resident) – queried the reason for two rather than one stormwater management area.
  - Janet Fraser (WDC) – suggested the use of excavated material from the Kaiapoi River to contour the stormwater management areas (as well as other areas).
  - Peter Hurford (Mainpower) – raised concern over the location of the proposed eastern stormwater management area in relation to existing electricity infrastructure.
  - Alister Fisher (Resident) – raised concern over the affordability of maintaining infrastructure going forward.
  - Peter and Tracey Binnie (Residents) – raised concern over the proposed location of the pump station on Feldwick Drive.
  - Donna Girdler (Resident) – raised concern that the stormwater management areas will be “mosquito farms”.
  - Nicky Hussey (Resident) – requested sufficient toilets for the sports fields in Kaiapoi East.
  - Carol Bisseker (Resident) – supported making the Dudley Drain nicer.
  - Stan and Carol Price (Residents) – requested maintaining Fire Brigade access to Area 24a is amalgamated into the Trust.
  - Abbie Campbell (Resident) – suggested use of land in Kaiapoi West for a stormwater retention area and use of land in Kaiapoi East for a stormwater wetland.
  - James Imlach (NZMCA) – requested access to potable water and wastewater dump station for the proposed campervan park.
  - Ann Stephenson (Resident) – suggested Area 25 (where a stormwater pipe is located) should be incorporated into the Yacht Club.
  - Peter and Gail Midgley (Residents) – suggested Area 25 (where a stormwater pipe is located) should be incorporated into the Yacht Club and Area 19 (where stormwater pipes and drains are located) should be sold.

- Russell Keetley (Resident) – promoted residential development in Kairaki and The Pines Beach.
- Kelvin Hill (Resident) – suggested toilet facilities in The Pines Beach.
- Louise Courtenay (WDC on behalf of WACB) – suggested the use of the area next to the Waimakariri Sailing and Power Boat Club for a rigging area and raised concern about the cost of servicing red zone stayers.
- Tim Stephenson (Resident) - suggested Area 25 (where a stormwater pipe is located) should be incorporated into the Yacht Club and Area 19 (where stormwater pipes and drains are located) should be sold.
- Graeme Sharp and Diane Brandish (Residents) – raised concern over the cost of providing services to red zone stayers.
- J and L Meyer (Resident) – suggested moving the stormwater pond to the rural areas.
- Lydia Bloy (DPMC) – suggested the use of ‘rural residential’ for the areas currently shown as ‘rural’ to allow for potential medium to long term change from rural to rural residential use and promoted the efficient and financially responsible use of existing infrastructure as a theme to be highlighted in the Preliminary Draft.

4. These submission generally breakdown into the following key themes:

- Protection and use of existing services
- Affordability of providing services to existing properties
- Servicing new developments
- Proposed Feldwick Drive Pump Station
- Stormwater management areas

5. In addition to commenting on the submissions, general comment is also made on 3 Waters servicing within the preliminary draft Recovery Plan.

## **Technical discussion**

### Protection and use of existing services

6. Several submitters suggested the change in use of land in The Pines Beach and Kairaki area to private or other use, such as for the Waimakariri Sailing and Power Boat Club. There are existing services located in these areas either within an existing road reserve or on Crown land protected by an existing easement. It will be important to ensure the alignment is protected for maintenance and future replacement of these assets for any future land use.
7. The Crown suggested in their submission that the land proposed for rural use could also be used for rural residential. There is a lot of existing key infrastructure through the proposed rural land, particularly in Kaiapoi East, which is located predominantly within the existing road reserve. This will be a key consideration and potential limiting factor in the change in proposed use of this land. The Crown also promoted the efficient and financially responsible use of existing infrastructure as a theme to be highlighted in the Preliminary Draft, which is supported.
8. Mainpower have noted that they still have power supply services below ground, generally within the existing road reserves, in the recovery areas. Many of these services will need to be maintained.

9. Council was aware of these services, and indeed has some water and wastewater services within the recovery areas. For example, a key trunk sewer main runs up Jollie Street and then east along Cass Street to the eastern boundary of the recovery area. Services such as these will need to be maintained within road reserve.
10. There would be some benefit in preparing an overall plan covering key infrastructure services that need to be maintained in Council owned land. This plan will be prepared and included as an appendix in the final draft of the Recovery Plan.

#### Affordability of providing services to existing properties

11. A number residents and the Woodend Ashley Community Board expressed views about the reasonableness and affordability of providing services to the existing properties within the recovery area.
12. Firstly, it is important to note that a legal option commissioned by the Council and CERA confirmed that the Council is legally obligated to continue provision of services to existing properties that remain within the recovery area. Furthermore, we have received formal comments from the Human Rights Commission that support this position.
13. The key matter for consideration then becomes what level of service should be provided to those properties and how those services should be funded.
14. The Council has already reinstated effectively permanent services to some properties within the recovery areas. The model developed for this is that the Council has funded the works to restore services to the property boundary, but in some cases the property owners have accepted a modified level of service. This predominantly relates to the provision of wastewater where the cost to reinstate a gravity service would be excessive and the resilience offered by such a service would not be in the best interests of the ratepayer or the property owner. In these instances, the gravity sewer connections have been replaced by an on-site wastewater pump station, which was funded and installed by the Council, but the ongoing ownership and maintenance responsibility of the on-site system rests with the property owner.
15. This method has been found to provide the best balance affordability (to both the property owner and the ratepayer), resilience, and fairness.
16. The recovery plan has therefore made provision for the residential properties that remain within the recovery areas to continue to receive water and wastewater services, but that the level of service, particularly relating to wastewater, may be changed from the pre-earthquake level of service.

#### Servicing new developments

17. There were a number of submissions on the provision of toilets to the proposed campervan park, the proposed sports fields and The Pines Beach area. Generally, there is existing nearby services to cater for such provisions although the extent the services will need to be extended is dependent on the final proposed location of the toilets.

18. Additionally, there are a number of comments regarding relocating facilities or adding facilities within the proposed spatial plan areas. It is important to note that when moving facilities or adding facilities, services will need to be extended to those new locations.
19. I have broadly considered the proposed changes to the draft spatial plan and am satisfied that these changes would not result in substantial additional costs associated with water and wastewater servicing.
20. Some submissions have sought that provision be made for further residential or commercial development within the recovery areas. The servicing that has been planned and budgeted for makes provision to service the specific facilities that have been shown in the plan and to some extent these services will have some spare capacity.
21. However, specific provision has not been made to service the undeveloped areas on the plan. These include the rural and business areas shown on the plan. That said, the existing and proposed trunk infrastructure within and adjacent to the recovery plan areas generally does have capacity to accommodate the reasonable levels of development that could reasonably be expected. It would be incumbent on the developer of this land to design and install the infrastructure to service any development areas and to link it into the existing trunk infrastructure.
22. On balance, I am satisfied that this is the most efficient and cost effective way to plan for the infrastructure requirements of the existing and future areas. This will ensure that the existing ratepayer and taxpayer is not overly burdened by constructing infrastructure for a demand that may never arise, but at the same time ensure that future development could be accommodated with a reasonable level of infrastructure investment.

#### Proposed Feldwick Drive Pump Station

23. Mr and Mrs Binnie have submitted that the proposed wastewater pump station should not be located in the proposed reserve, adjacent to their southern boundary at 51 Feldwick Drive.
24. When locating a wastewater pump station, there is always a difficult balance to achieve between finding the optimum location to minimise the depth of the sewer (which affects the cost and resilience) whilst minimising the impact on adjacent properties.
25. The proposed location has been selected as it is at the intersection of two incoming wastewater lines, and therefore minimises the depth of the sewer. The effect on the neighbouring properties has been considered and been accounted for in the following ways:
  - The pump station will be constructed below ground, with only an electrical cabinet, fence, and landscaping above ground. The photo below shows a similar pump station located on Hilton Street. This pump station would be very similar and would have minimal visual impact.
  - The pump station site is surrounded by landscaping to further reduce the visual impact of the site.
  - The pumps are installed approximately 5 metres below ground in the pump chamber and below water level. It is therefore difficult to hear the pumps running when standing

on the pump station and it certainly would not be possible to hear the pumps running from the neighbouring boundary.



**Photo of existing wastewater pump station on Hilton Street**

26. Despite the minimal impact the pump station would have on the property at 51 Feldwick Drive, Council staff have reviewed the location and acknowledge there is an opportunity to move it slightly so it is 10 metres off the southern boundary of 51 Feldwick Drive, which will further reduce the impacts on that property. The spatial plan has been amended to reflect this change.

#### Stormwater management areas

27. In Kaiapoi East, the position of the two proposed stormwater management areas (SMAs) is based on locating the areas at the existing low points, as queried by Mr Bayliss. There are two SMAs as there are two low points, with a localized high point generally on the alignment of Jollie Street. It may be possible to amalgamate the SMAs into one area adjacent to Feldwick Drain, but this would require larger more expensive infrastructure to convey the stormwater to this area.
28. There is scope to shift or change the shape of the SMAs to integrate with surrounding land uses, but any significant changes would also increase costs due to additional earthworks. The suggestion by Mr Meyer to shift the western SMA into the proposed rural area is feasible, but would be more expensive in terms of additional conveyance and earthwork costs. It is noted that there is existing infrastructure, as raised by Mr Hurford of Mainpower, that will need to be taken into account when positioning the SMAs.
29. The type of SMAs is likely to be a wet pond given the high groundwater in the area. This potentially could be a wetland type pond, as suggested by Ms Campbell, for stormwater treatment with an adjacent dry detention area for stormwater attenuation. This type of system is similar to the Southbrook Park SMA which is integrated with the adjacent dog park.



**Photo of Southbrook Park Dog Park with the Stormwater Wetland in the Background**

30. Mrs Girdler raised concern over the ponds becoming a “mosquito farm”. This is a consideration that will be addressed as part of the design to ensure the pond depth, configuration of the inlet and outlet and proposed planting, are appropriate to prevent warm stagnant water occurring which causes mosquito breeding.
31. It should be noted that the size of the SMAs is dependent on the impervious percentage of the contributing catchment. Therefore, any development proposed as part of the Draft Recovery Plan will increase the required size of the SMA.
32. Ms Fraser of WDC suggested that excavated material from the Kaiapoi River could be used contour the stormwater management areas (as well as other areas). This is potentially feasible provided the material was not contaminated and was appropriate for engineering fill.
33. In Kaiapoi West, Ms Campbell suggested that the land could be used for stormwater retention. Some form of stormwater attenuation is likely to be required to address the increase in impervious area in the proposed business area. This will be dependent on the nature and extent of impervious area proposed by the future development and whether the existing stormwater system has capacity to accommodate the increased flows.
34. Ms Bisseker supported the widening and regeneration of Dudley Drain which is acknowledged.

#### General Comments on 3 Waters Servicing

35. The following sets out my general comment on 3 Waters servicing within the preliminary Draft Recovery Plan, which includes additional background information on the purpose of some of the proposed 3 Waters infrastructure.

#### *Goals*

36. In section 1.2, Goal 1 suggests that levels of service will be restored. While elsewhere in the document it is acknowledge that servicing and roading to private properties in the red zone will remain but at a lower level of service (e.g.: private on-site pump stations). This goal needs some qualifying words such as “where practicable”.

### *Kaiapoi West*

37. The objectives of the proposed Dudley Drain reserve are to allow for the drain to be repaired (retaining walls along its banks were damaged in the earthquakes) and to allow for the drain to be regenerated to improve amenity. As this drain is upstream of the Dudley Drain pump station, we consider it to be part of our network as opposed to a receiving environment, therefore we are not proposing any aquatic habitat work but the planting will be native and will enhance the environment adjacent to the drain. The proposed reserve width is 20m (approximately 10m either side of the drain) and will provide an opportunity for a pathway linkage.
38. The proposed land use / activity of a sport and recreational reserve, particularly the playground and paths, seating, planting, are well suited to be integrated into the proposed Dudley Drain reserve as neighbouring land uses. The width of the reserve may need to be increased if intensive business development was to be proposed immediately adjacent to the reserve.
39. As mentioned in my response to submitters, it is likely that a SMA will be required to address the increase in impervious area in the proposed business area, particularly if it is extended to the Dudley Drain reserve. This will be dependent on the nature and extent of impervious area proposed by the future development and whether the existing stormwater system has capacity to accommodate the increased flows.

### *Kaiapoi South*

40. I support the proposed option of retaining the existing road alignment. While we still have damaged infrastructure in these roads (e.g. the large 1200mm stormwater main that needs to be repaired), by in large the existing 3 waters services are in good condition. Realigning the road as per Option 2 in Appendix 5 would have significant costs not currently budgeted for and would mean that key infrastructure is not located within the road.
41. There are existing wastewater and stormwater services through Area 3, which may need to be relocated depending on whether the final land use and landownership. Currently this area slopes away from the road to a central low point running parallel to the river, which may need to be filled and raised to fall out to the road reserve, particularly for any activity that requires the construction of buildings. It is also noted that this area is prone to flooding in the 200 year event, therefore raising of ground levels may be required for proposed building not just large format retail as indicated in the preliminary draft Recovery Plan. The wastewater main through this area currently services some of the existing private properties in Bowler Street, which will be rationalized and abandoned in the future once an alternative permanent system is provided to service these properties.
42. The Kaikanui stormwater management area (SMA) is located to the south of this area off the Oaks reserve. This SMA was repaired following the earthquakes, however is restricted by limited space for access and future expansion (for improved water quality treatment). We therefore request that a 30m wide strip of land adjacent to the SMA be set aside to transfer to Council for future proofing the development of the Kaikanui SMA. This has been included in the draft Recovery Plan.
43. I support the proposed option of retaining the proposed recreational and ecological linkage opposite Charters Street as we have a key wastewater rising main that is located in the existing

walkway. The development of this reserve needs to consider the presence and access for maintaining / replacing this main in the future.

44. There is scope to change the location of the proposed wastewater pump stations in the Kaiapoi South area. It is considered that locating the pump stations in the proposed heritage and mahinga kai area is not the most appropriate location. Consequently the draft Recovery Plan has been modified to show the pump stations on the opposite side of Courtenay Drive in the proposed rural area. The design of the pump stations will include landscaping to ensure that the pump stations blend in with the surrounding area and are not an eyesore.

#### *Kaiapoi East*

45. As mentioned in my response to submitters, there is existing underground infrastructure (including a wastewater rising main that serves approximately one third of Kaiapoi) within the Kaiapoi South area, in particular Area 12, that needs to be protected and provisions made to ensure maintenance and replacement can be easily undertaken in the future. This is not only for Council services but other utility providers as well (e.g.: Mainpower). We assume that while Area 12 is shown as converting to rural, the underlying road reserve status will still remain which will give Council and other utility providers continued access for maintenance and replacement of assets. This is a key aspect that needs to be clearly set out in the draft Recovery Plan.
46. There is also the Feldwick Drain stormwater pump station located at the south east corner of the Kaiapoi East area. The pump station is old and is programmed to be upgraded but may be replaced at a different location (potentially further back along Feldwick Drain at Beach Road). However, access for maintenance purposes is still required to this pump station, whether this is for the short or long term. Access to this pump station is not clearly shown on the current plan, which essentially could be an extension of the access to the boat ramp.
47. Area 12 / 14 east of Feldwick Drain should be separately identified as land to transfer to Council for a potential land swap with the adjacent property owner. I am not sure where Area G is referred to in the Section 4.4.5 of the document. This will give an additional 16m (not 10m) along Feldwick Drain to form a reserve for enhancement of the drain and for amenity purposes such as a walkway linkage and planting. This link should be shown to extend down to the Feldwick Drain stormwater pump station.
48. The stormwater management areas shown are indicative only, but have been located at the existing low points in the Kaiapoi East area. The final position, shape and size of the SMA's is still to be determined and will be integrated with the adjacent land uses / activities. Note that with the proposed business and parking and campervan park in areas 15, 16 and 17 the western SMA will need to be bigger than currently indicated to allow for the increased treatment and attenuation of stormwater required. The nature of a SMA is well suited to be adjacent to recreational and ecological links, district sports and recreation reserve (such as the dog park) and rural land uses.
49. The SMA's are both likely to be a wet pond (not wet only following significant rainfall events as indicated in the document) given the high groundwater level in the area. The design and construction of the SMA will need to follow the development of the concept plan for the dog park and BMX track. The land for the SMA and associated infrastructure needs to be vested in Council.

50. Consideration should be given to having a link from Sewell Street through to the SMA for a route for existing stormwater flows – could be a road or walkway.

#### *The Pines Beach*

51. As mentioned in my response to submitters, there is existing drainage infrastructure in the section of Kay Avenue shown to be changed to a Council reserve that needs to be protected along with another pipe across Area 19. There is also a damaged section of pipe through the Council land opposite McGarry Reserve. It is understood that this land will become part of the recreation and ecological reserve, but this needs to be made clear in the draft Recovery Plan. These pipes need to be protected and provisions made to ensure maintenance and replacement can be easily undertaken in the future.

#### *Kairaki*

52. There are existing drainage swales protected by easements through Area 23 and also a pipe through Area 25 which is protected by an easement. These alignments need to be protected and any private leases would need to allow for the presence of the drainage swales and pipes and ensure future maintenance or replacement is not compromised.
53. There is also the Environment Canterbury stopbank along the banks of the Kairaki Creek that should be listed as existing infrastructure in the draft Recovery Plan.

#### **Technical recommendation / conclusion**

54. It is recommended that an overall plan showing the key existing infrastructure services that need to be maintained in Council owned land is developed. This plan will be prepared and included as an appendix in the final draft of the Recovery Plan. The purpose of this plan would be to ensure the existing alignment and position of key infrastructure is protected for maintenance and future replacement of these assets for any future land use.
55. The draft Recovery Plan should include more detail on the purpose and need for both existing and proposed infrastructure within the recovery areas. The additional background information on the purpose of some of the proposed 3 Waters infrastructure included under the general comments on 3 Waters servicing sets out the type of information to be included.
56. The proposed pump station adjacent to the property at 51 Feldwick Drive, is recommended to be moved slightly so it is 10 metres off the southern boundary the property, which will further reduce the impacts on that property. The spatial plan has been amended to reflect this change.
57. Goal 1 in section 1.2 of the document should be revised to acknowledge that servicing and roading to private properties in the red zone will remain but at a lower level of service.
58. A 30m wide strip of land adjacent to the Kaikanui SMA should be set aside to transfer to Council for future proofing the development area. This has been included in the draft Recovery Plan.
59. The location of the proposed wastewater pump stations in the Kaiapoi South area should be shifted from the proposed heritage and mahinga kai area. The draft Recovery Plan has been modified to show the pump stations on the opposite side of Courtenay Drive in the proposed rural area.

60. The status of the underlying road reserve needs to be clearly set out in the draft Recovery Plan that it will still remain in Council ownership and continue to give Council and other utility providers continued access for maintenance and replacement of assets.
61. Area 12 / 14 east of Feldwick Drain should be separately identified as land to transfer to Council for a potential land swap with the adjacent property owner. The proposed reserve link along Feldwick Drain should be 16m wide (not 10m) and extend down to the Feldwick Drain stormwater pump station.