DUNEDIN CITY COUNCIL | kaunihera a-rohe o Ōtepoti

Memorandum

TO:	Bede Morrissey, Policy Planner, City Development
FROM:	Bruce Saunders, Strategic Planning Engineer, 3 Waters Jared Oliver, Engineering Services Team Leader, 3 Waters
DATE:	26th August 2022
SUBJECT:	**VARIATION 2: 3 WATERS RESPONSE TO SUBMITTER EVIDENCE ON GREENFIELD REZONING SITES**

INTRODUCTION:

1. We have reviewed the submitter evidence received in relation to 3 waters matters.
2. We have considered the relevant evidence on 3 waters matters for the sites.
3. Please find below our response to the submitters' evidence.

RS193: 177 Tomahawk Road – Rezoning from Rural to General Residential 1

3 Waters	Comments (provided in s42a Report)	Comments (response to submitters evidence)
Overall	Not supported from a 3 Waters perspective for stormwater reasons, preference is to exclude. Tomahawk Lagoon is classed as a regionally significant wetland, consent required for stormwater discharge and is expected to be very difficult to obtain.	The submitters evidence has been reviewed. Our initial comments stand, and our position remains the same. We do not support rezoning of the site. While we do not support it, we note that a partial rezone on the upper part of the site to cover the proposed 8 sites in Area 'A' of the structure plan may be possible in terms of 3 Waters infrastructure. It is noted that 155 Tomahawk Road has been rezoned as General

3 Waters	Comments (provided in s42a Report)	Comments (response to submitters evidence)
		Residential 1 and there is an opportunity to combine stormwater management and wastewater conveyance for both sites.
Potable Water Supply	Existing infrastructure appears to be adequate based on a high-level assessment. Connection points would be Gloucester Street and Tomahawk Road. Upgrade to the main in Gloucester Street may be required. High water pressure at low elevations on the site may be an issue and pressure reduction may be necessary. Further detailed modelling of the water supply infrastructure would be required to confirm. Some upstream upgrades required.	No further comments.
Wastewater	Existing infrastructure provides enough capacity for additional flow but does not achieve the grade for self-cleaning. Connection would be to the existing network across Tomahawk Road. The existing wastewater infrastructure in this part of Dunedin connects into a pumped system downstream. The capacity of the pump station to accept additional flows would need further assessment.	If 177 Tomahawk Road were rezoned, both it and 155 Tomahawk Road could utilise the same new wastewater main. This is more efficient infrastructure provision.
Stormwater	The site is located adjacent to and discharges to Tomahawk lagoon and other tidal-influenced coastal areas, all downstream of the site. It is assumed that an overland flow path can be established/designed to be directed to safely discharge to these tidal areas from the site, without the need for onsite attenuation. Erosion protection and stormwater quality treatment would be required to protect water quality. Tomahawk Lagoon is classed as a regionally significant wetland. Discharge would require resource consent from ORC. Experience with existing consents for stormwater discharges to Tomahawk Lagoon indicate that obtaining consent would be extremely difficult. Strong community and manawhenua opposition to a consent would be expected. Development of the site gives no natural buffer zone to the lagoon. We would suggest that it is better to rezone this to a recreation zoning or at least incorporate a lagoon buffer to natural/biodiversity zone.	The "preliminary stormwater management options" evidence (commissioned by e3 scientific) is a thorough report, however it is based on the development of only 8 lots, adjacent to Gloucester Street (Area 'A' of the structure plan (S33-FS242.1)) and not the rest of the site (Areas 'B', 'C' & 'D'). It appears from the evidence that stormwater management for Area A is possible (although calculations used for sizing stormwater infrastructure were unable to be verified). If 177 Tomahawk Road were rezoned we would support the option presented in the "preliminary stormwater management options" evidence to capture and treat stormwater generated in the adjacent 155 Tomahawk Road. This could be achieved by placing an NDMA over both sites.

3 Waters	Comments (provided in s42a Report)	Comments (response to submitters evidence)
	Meeting the new stormwater management rules in Variation 2 is not expected to be sufficient to address stormwater issues due to the consenting requirement and Tomahawk Lagoon's status as a regionally significant wetland.	It is unclear as to whether adequate stormwater management is achievable for the residential sites proposed in the structure plan as no evidence was provided to support this. The evidence from Aukaha is noted and while Aukaha "have no specific concerns with the proposed re-zoning of the subject site" this is on the understanding that several conditions be met, including stormwater sampling. Aukaha notes that DCC already undertake stormwater sampling, but that further sampling associated with redevelopment of this site should be undertaken. This would have an ongoing operating cost impact to DCC. Despite the additional evidence regarding stormwater management, we still have concerns over the ability to obtain a resource consent for stormwater discharge. If any form of rezoning were to occur for this site, it should be on the condition that: • The applicant is to be responsible for obtaining any resource consents associated with stormwater discharge, with input from DCC, and that the resource consent is to be vested to DCC; • Stormwater management should be combined with the adjacent 155 Tomahawk Road; • An NDMA and or RTZ is placed over 177 Tomahawk Road, and would ideally also include 155 Tomahawk Road to ensure that stormwater management is integrated, and costs can be shared between owners.

RS204: 21, 43, 55, 65, 75, 79, and 111 Chain Hills Road – Rezoning from Rural Residential 1 to a mix of zones (GR1, LLR1) as shown on submitters structure plan

RS153: 77 and 121 Chain Hills Road and 100 Irwin Logan Drive, Mosgiel – Rezoning from Rural to a range of Residential and Rural Residential zones. Note – requested additional sites are included: 2-20 Jocelyn Way, 38 and 40-43 Irwin Logan Drive, and 25-27 Pinfold Place.

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
Overall	Not supported from a 3 Waters perspective, for all three waters but primarily for water supply reasons. There are also concerns regarding stormwater, which may also be expensive. Further investigation, particularly for water supply is considered necessary and water supply issues aren't going to be resolved in the near term. Strong preference is to exclude or make long term.	The submitters evidence has been reviewed. Our initial comments stand, and our position remains the same. We do not support rezoning of the site.
Potable Water Supply	The existing infrastructure is inadequate to service the proposed development due to current supply constraints to Mosgiel in peak summer demand periods and low pressures for the higher elevation parts of the site, above 100m. Booster pumps would be required to service the higher elevation parts of the site as well as additional reservoir storage. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy. Significant upstream network upgrades required and will be medium term timeframe to resolve.	The submitter has provided evidence on 3 Waters in two parts. One part is for areas A, B and N of the structure plan (Drawing "Proposed Zones", the other is for areas E, G, F, K and H. Based on the evidence there does not appear to be a holistic approach to water supply proposed for the whole of the proposed site. Information provided in the evidence regarding the existing water network is correct. Calculations provided for estimating normal and peak water demands for areas A, B and N appear to be correct and to the correct standards. For the submitter evidence regarding water supply for areas A, B and N of the structure plan (Drawing "Proposed Zones"). Parts of area B would suffer from low water pressures without booster pumping. The submitter proposes providing booster pumping for

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
		the high elevation parts of area B using a booster pump station and reservoir that is already required to service the existing Low Density Residential area (Gladstone Heights 1-7). It is unclear whether the booster pump station and reservoir that is already required to service the existing Low Density Residential area (Gladstone Heights 1-7) have already been designed and constructed or not, or whether they have sufficient capacity for the additional demand of servicing areas A, B and N of the structure plan. The evidence presented regarding firefighting water capacity for areas A, B and N is unclear and the ability of the water supply proposal for this area to meet SNZ PAS 4509:2008 NZ Fire Service Fire Fighting Code cannot be verified. Areas F and G are proposed to be serviced by a restricted water scheme. Our view is that the combination of on demand, restricted and unserviced water supply servicing across the whole site is an unfavourable approach due to the varying levels of service within a small area and the likely future challenges to this from customers. There is currently no restricted water supply servicing in Mosgiel (East Taieri is the nearest restricted water supply scheme). Area E is proposed to be serviced by an additional booster pump station additional to the booster pump station and reservoir that is already required to service the existing Low Density Residential area (Gladstone Heights 1-7). No additional water storage at higher elevation is proposed for Area E so the booster pump station would require a back-up generator (diesel) and need to be capable of providing firefighting water supply (higher flows than normal demand).

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
		This approach results in double pumping (triple pumping if the pumping of water from Dunedin to Mosgiel is also considered) and carries some risk in the reliance on automated systems for provision of firefighting water supply. We believe that the water servicing approach is not "good-quality" in the sense envisaged in the Local Government Act 2002. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy. We do not support the rezoning of any areas that require additional pumping. There are significant upgrades of the existing water network required for water supply. The timing for the upgrades is medium term and will be different to that of the developers.
Wastewater	The site's northern location has an adequate connection to wastewater pipes, flow from some of these goes to Mosgiel Wastewater Treatment Plant (WWTP), while some goes to Green Island WWTP. However, the southern end of the proposed site is far from a connection point and unless easements through neighbouring property were obtained, would require pumping. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy. Significant downstream network upgrades required as the network and treatment plants have issues in wet weather events. Medium to long term to resolve.	The submitter has provided evidence on 3 Waters in two parts. One part is for areas A, B and N of the structure plan (Drawing "Proposed Zones", the other is for areas E, G, F, K and H. Areas G, F, H and K are proposed to be self-serviced for wastewater. Information regarding the existing wastewater network is correct. Calculations provided for estimating normal and peak wastewater flows appear to be correct and to the correct standards. Two options are proposed for servicing of Area E. These would require further investigation to determine the best approach. No evidence is provided regarding flows, soil type and topography to indicate whether self-servicing for wastewater in areas G, F, H and K is feasible.

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
		There are significant downstream network upgrades required as the wastewater network and treatment plants have issues in wet weather events. The timing for the upgrades is medium to long term and will be different to the developers.
Stormwater	There is no stormwater infrastructure close to the subject site, flow is by open watercourse eventually connecting to ORC Schedule Drains (O5 to the west, also known as Quarry Creek, and O11 to the north). Both of these then connect to the Owhiro Stream. The Owhiro Stream has capacity issues in rainfall events when the Taieri River level is up and the Owhiro can not discharge into it, this results in flood issues in Mosgiel. There are known and significant flooding issues downstream of the proposed site and concerns from residents at Woodland Avenue, business in the Gladstone Road South Industrial area and East Taieri School. Some of the other developments adjacent to the proposed site have implemented stormwater management poorly, resulting in issues for residents and DCC. The fragmented nature of the stormwater management approach has exacerbated this. The capacity of the overland flowpaths is unknown, therefore onsite attenuation is required for 100-year storm event. Provided the new stormwater management rules in Variation 2 are applied to the whole proposed area the site may be considered developable, however we have concerns over the affordability of the stormwater infrastructure and the risks to downstream areas if stormwater management is not properly implemented.	The submitter has provided evidence on 3 Waters in two parts. One part is for areas A, B and N of the structure plan (Drawing "Proposed Zones", the other is for areas E, G, F, K and H. The submitter makes references to existing standards for stormwater management and appears to make allowance for several of the requirements introduced and now operative through policy and rule changes in the 2GP resulting from Variation 2, but does not specifically name these. The evidence does not go into detail on the sizing of stormwater management infrastructure. It is a high-level assessment to consider options for stormwater management. The evidence proposes a preferred approach to stormwater management. Insufficient information has been provided for us to indicate whether we agree or not. It is unclear whether the stormwater management proposed would meet the stormwater management policies and rules that are now operative through Variation 2 of the 2GP. The submitter evidence is also silent on our concerns regarding affordability. The submitter evidence did not appear to provide any further evidence to support their view that if the area were to be rezoned rezoned, a structure plan mapped area be added to the 2GP to manage development on the site rather than a new development mapped area (NDMA).

RS110: 23 Sretlaw Place – Rezoning from Rural to General Residential 1

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
Overall	Not supported from a 3 Waters perspective for wastewater and stormwater reasons, preference is to exclude.	The submitters evidence has been reviewed. Our initial comments stand, and our position remains the same. We do not support rezoning of the site. As per our evidence, our primary reasons for our position are wastewater and stormwater concerns.
Potable Water Supply	Minor network extensions required to connect the site. There is a water connection within Sretlaw Place. Possibly some minor network upgrades required.	No further comment. No submitter evidence was provided regarding water supply.
Wastewater	Minor network extension required to connect the site. The existing local infrastructure provides enough capacity for additional flow and achieves grade for self-cleaning. The site will require a pump system to be installed to connect to the existing infrastructure. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy. Flow goes to Kaikorai Valley then South Dunedin in wet weather to reach Tahuna Wastewater Treatment Plant. Wastewater overflows occur into Kaikorai Stream and South Dunedin (entering Dunedin Harbour) including Surrey St affecting the environment and creating a public health risk. Significant downstream upgrades required to address this. Long term timeframe to resolve these.	The submitter evidence does not detail any connection to the wastewater system and does not address our concerns regarding wastewater pumping for this site. It is noted that the submitter suggests effects on the downstream wastewater network issues (stormwater infiltration) should be fixed by DCC. As indicated in our evidence, future upgrades to address existing infrastructure constraints in Kaikorai Valley and South Dunedin have a long-term timeframe to resolve. As such the timing of the existing network upgrades versus the timing of this development, were rezoning to take place, would be quite different. The submitter evidence does not change our opinion regarding wastewater servicing for the proposed site.
Stormwater	Downstream of the site is Frasers Creek. Water flows from Fraser Creek into Kaikorai Stream. There are known flooding issues downstream at Glenelg St that affect Stone St roundabout and downstream areas. The capacity of Frasers Creek is unknown. Therefore on-site attenuation for the 100-year ARI storm flows has been assessed. The area of land required for stormwater	The submitter has proposed stormwater management involving a pond situated at the northwest of the site. The submission does not detail how stormwater would be managed at the northeast side of the site (the lowest point).

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
	management is over 20% of the total area of the site and is not considered feasible. ORC has flood hazard mapping of the Kaikorai Stream (*Flood hazard of Dunedin's urban streams, ORC, 2014*). Frasers Gully also has high ecological value. Potential degradation of Frasers Creek is counter to the principles of Te Mana o te Wai.	Some stormwater attenuation volumes are provided however, the calculation workings to obtain the volumes are not shown. The stormwater attenuation volumes are lower than we would expect. No detail is provided on how stormwater quality requirements would be achieved. There is still a risk of not protecting the ecological value of Fraser's Gully and the neighbouring property. It appears unlikely that stormwater management policy 9.2.1.Z, and rules, 9.9.X, that are now operative through Variation 2 of the 2GP would be met by the proposal for stormwater management. The submitter evidence is also silent on our concerns regarding affordability.

4. During the hearing submitters provided evidence which has prompted you to ask for further information as follows:

- The submitter has provided evidence relating to stormwater management. This indicates that stormwater management is feasible. Your evidence indicates its likely not feasible, given the area required. Can you please provide comment on the submitters evidence with respect to stormwater management.
    - Please see our response to submitter evidence in the Stormwater section of the table above.

- For wastewater, your existing 3 Waters evidence indicates issues with downstream wastewater overflows. Submitter's view is this is the Council's problem to resolve. The Panel has asked if there is a tipping point for these overflows? I.e., is there a certain number of houses developed upstream that could be supported? Essentially, would 17 additional houses have enough cumulative impact to tip the downstream wastewater overflows over the threshold to what is acceptable?
    - In our opinion the tipping point for wastewater overflows in the Kaikorai wastewater catchment has been reached through current zoning in the catchment. Any further rezoning beyond that already allowed through current zoning pushes the wastewater overflows past the tipping point. The nature and impact of the wastewater overflows is detailed in our previous evidence. These overflows currently occur several times per year in one or other location, sometimes in rainfall events as minor as approximately 10mm.
    - Flows entering the Tahuna Wastewater Treatment Plant in wet weather can be 8-10 times the normal flow. This has the effect of washing out the treatment plant biology and can result in an inability to meet discharge consent requirements for several days or weeks.

- As indicated in our evidence, future upgrades to address existing wastewater infrastructure constraints in Kaikorai Valley and South Dunedin have a long-term timeframe to resolve.
- This site is not the only one in Kaikorai Valley that seeks to or has the potential to be rezoned or has been rezoned or intensified already through Variation 2 or 2GP appeals. When considering cumulative effects consideration needs to be given not to just the 17 lots associated with this site but to all the areas within the Kaikorai Valley wastewater catchment that have been:
  - rezoned or intensified already through Variation 2 or 2GP appeals
  - as yet undeveloped areas that are development zoned in the original 2GP and previous District Plan

- Current zoning in the Kaikorai Valley wastewater catchment puts wastewater overflows at the tipping point. Given the current impacts of wastewater overflows and the further development capacity in the catchment enabled through current zoning any further rezoning should be considered unacceptable until existing wastewater infrastructure constraints in Kaikorai Valley and South Dunedin are resolved.

RS171: 3 Brick Hill Road and 18 Noyna Road, Sawyers Bay – Rural to Township and Settlement

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
Overall	Risky site from 3 Waters perspective, mostly due to wastewater and somewhat due to water supply. Preference would be to exclude or make long term. Downstream of the site are several wastewater pump stations. Wastewater overflows occur at Sawyers Bay in wet weather, this negatively impacts the environment and local shellfish business.	The submitters evidence has been reviewed. Our initial comments stand, and our position remains the same. We do not support rezoning of the site. As outlined in our original assessment, there are existing constrained water supply and wastewater issues in the wider network which will take some time to resolve.
Potable Water Supply	Existing local infrastructure is adequate to service the proposed site. The water supply zoning and pressure requirements are within specification. The location of connection would be on Sir John Thorn Drive. Significant upstream upgrades required. Fed from Port Chalmers supply which is constrained during peak hot summer periods. Medium term to resolve (5-8 years).	No further comment.
Wastewater	Existing local infrastructure (located on Sir John Thorn Drive) provides enough capacity for additional flow. Downstream of the site are several wastewater pumping stations, including the most	The submitter evidence states that Lots 1 and 2 are required to pump their wastewater to the new sewer network. 3 Waters prefer gravity

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
	immediate downstream pump station at Sawyers Bay. Wastewater overflows occur at Sawyers Bay in wet weather, negatively impacting the environment and local shellfish business. Significant downstream wastewater upgrades may be required. Long term to resolve. Could be a candidate for communal wastewater detention alternative if sufficient scale and developed as one development.	to pumping where possible to lower operating and maintenance costs while supporting DCC's zero carbon policy.
Stormwater	Downstream of the site there is an open channel. The existing capacity of the receiving open channel is unknown. No DCC stormwater infrastructure is present nearby. Flows would have to pass through Waka Kotahi or Kiwirail culverts to reach Otago harbour. Erosion protection and stormwater treatment would be required. It is assumed that the infrastructure is not easily upgradable. Due to this and the unknown capacity of the open channel on-site attenuation to meet the 100-year ARI conditions has been assessed to ensure that post-development flows do not exceed existing conditions. Provided the new stormwater management rules in Variation 2 are applied to the whole proposed area the site may be considered developable, however we have concerns over the affordability of the stormwater infrastructure.	Some information was provided regarding stormwater management. It is unclear whether the stormwater management proposed would meet the stormwater management policies and rules that are now operative through Variation 2 of the 2GP. The submitter evidence is also silent on our concerns regarding affordability.

GF07: 33 Emerson Street - Rezoning from Rural to General Residential 1

5. The evidence regarding 3 waters matters, provided by the submitter, Mr Robert Mathieson has been reviewed and we have no further comments to make. This evidence does not change our position, that the site can be rezoned as proposed in Variation 2.

RS169: 41 Emerson Street – Rezoning from Rural to General Residential 1

6. The evidence regarding 3 waters matters, provided on behalf of the submitter Victoria and Fiona Nicholson has been reviewed and we have no further comments to make. This evidence does not change our position, that the site can be rezoned.

7. The submitter noted in their evidence that "One difference between this site and the land at 33 Emerson Street is that Otago Regional Council has opposed this site on the basis that the land does not appear to have any planned public infrastructure to support such density. It is our view that this issue will resolve itself as the land at 33 Emerson Street is developed. During any subdivision of that land, the developer will be expected to extend infrastructure from the intersection of Roy Crescent and Emerson Street south along Emerson Street. This infrastructure would then simply be extended further to provide efficient servicing of the land at 41 Emerson Street. On this basis, it is our view that the subject site will in fact have planned public 3-waters infrastructure available to it."

8. We agree with the comments made by the submitter. If 41 Emerson St were to be rezoned it will be possible to plan the infrastructure such that it can service both 33 and 41 Emerson Street.

9. We recommend that if 41 Emerson Street is rezoned, that the NDMA that covers 33 Emerson St (GF07) is extended to include 41 Emerson Street, to ensure that 3 Waters servicing is planned and implemented in an integrated and efficient manner to service the development of both 33 and 41 Emerson Street.

RS14: Freeman Cl and Lambert St, Abbotsford – Rezoning from Rural to General Residential 1

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
Overall	Risky site from 3 Waters perspective, for all 3 Waters. There are several risks and issues for water supply, wastewater needs further investigation and while stormwater management is possible it is somewhat reliant on the proper functioning of the downstream sections of watercourse. The site location has an additional risk due to being situated within the Mt Grand Reservoir Dam Break Hazard Zone. Preference would be to exclude or make long term, otherwise consider reducing the proposed site by eliminating high and low elevation areas that would require additional water and wastewater pumping respectively.	The submitters evidence has been reviewed. Our initial comments stand, and our position remains the same. We do not support rezoning of the site. We also do not support rezoning of smaller areas of the site which some submitters have proposed such as: • 42a Lambert Street (wastewater and stormwater concerns) • 25 and 55 McMeakin Road (water and stormwater concerns)
Potable Water Supply	There is a connection point close to the site boundary. A minor local network upgrade is required to service the site. Within the site are a 750mm diameter raw water trunk main, and a 200mm diameter treated water trunk main. The raw water trunk main is the primary source water feed to the Southern Water Treatment Plant as so is a critical water supply main for Dunedin. An access corridor and buffer easement would be required to ensure that DCC can access and maintain the raw water trunk main. The 200mm treated water main does not have adequate capacity for the proposed development and would need to be upgraded. Higher elevation areas of the site would require pumping. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy. Significant upstream network upgrades required. Medium to long term to resolve.	We agree with the submitter for 42a Lambert St that extension of water supply services into this site would be relatively straightforward. The evidence provided by the submitter for 25 McMeakin Road proposes an alternative of rezoning only 25 and 55 McMeakin Road. While this would address concerns regarding water pressure (water supply would not require pumping) a significant portion of these two properties are within the high hazard areas of the Mt Grand Raw Water Reservoir Dam Break Hazard Zone. For this reason, the reduced area proposal is not supported. The evidence provided by the submitter for 55 McMeakin Road proposes an alternative of rezoning only 25 and 55 McMeakin Road. We agree with the submitters evidence that "provided that the land at 55 McMeakin Road is not rezoned in isolation from the land at 25 McMeakin Road the servicing of the land for water supply" is possible. However, as indicated above we have other concerns

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
	Eastern and southwestern sides of site are within the Mt Grand Raw Water Reservoir Dam Break Hazard Zone. Any development would need to either avoid development in this zone or be designed to mitigate property and life safety risks.	regarding water supply such that rezone of the reduced area proposal is not supported. The submitter's evidence does not change our opinion regarding water supply for the whole proposed site.
Wastewater	The existing wastewater infrastructure in this area gravitates to a pump station. Pump station capacity would likely need to be increased but verification of capacity is required through modelling. From a high-level desktop study it appears the local network has the capacity for the proposed development density and future development in the existing zoned catchment. Additional pumping would be required to service the lower lying western block of land but this may be undevelopable due to flood risks. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy. Some downstream network upgrades required.	The submitter for 42a Lambert St suggested that this property would need wastewater pumping for servicing due to this property being 7m below the existing DCC wastewater infrastructure. This evidence aligns with our own previous evidence and concerns regarding wastewater pumping, operating and maintenance costs and DCC's Zero Carbon policy. Our preference would be to exclude this property from any rezoning. The evidence provided by the submitters for 25 and 55 McMeakin Road propose an alternative of rezoning only 25 and 55 McMeakin Road. We agree with the evidence provided by the submitters regarding servicing of these areas. The submitter's evidence does not change our opinion regarding wastewater servicing for the whole proposed site.
Stormwater	The proposed site discharges to a stream which passes under the railway line downstream and is an upper tributary of Abbots Creek. No stormwater infrastructure is present downstream of the area to be developed. As the channel capacities are unable to be determined and the risk exists for flooding to neighbouring properties, it is advised to attenuate the 100yr ARI storm event to predevelopment levels to ensure post development flows are kept to predevelopment levels to ensure the stream integrity is maintained. Neighbouring properties have contacted DCC repeatedly about concerns over flooding, particularly as it relates to increasing	The evidence provided by the submitters for 42a Lambert St and 25 McMeakin Road does not change our view that provided the new stormwater management rules in Variation 2 are applied the property may be considered developable, but there is still significant risk to downstream landowners if watercourses are not properly maintained. Section 33 of the evidence provided on behalf of the submitter Wendy Campbell appears to suggest the use of stormwater detention tanks for individual lots. Some tank sizing information is provided but without evidence as to how the sizing information has been arrived at. We have concerns over the use of individual on-site

3 Waters	Comments (provided in s42a report)	Comments (response to submitters evidence)
	development in the catchment. There is evidence that downstream watercourses are not properly maintained, increasing flood risks. Provided the new stormwater management rules in Variation 2 are applied to the whole proposed area the site may be considered developable, however despite this there is still significant risk to downstream landowners if watercourses are not being properly maintained.	storage tanks for stormwater management, particularly for large subdivisions as they cannot be relied on for long-term performance and the cumulative potential impact on stormwater flows can be significant. Our view is that integrated stormwater management would be more appropriate for this site, with the use of communal stormwater management systems that are integrated with greenspaces and biodiversity areas where possible. The submitters proposed approach to stormwater management is not supported. The evidence provided by the submitters for 25 and 55 McMeakin Road propose an alternative of rezoning only 25 and 55 McMeakin Road. The evidence suggests raising of land to mitigate flood risks. We have concerns about this approach as it may result in the displacement of flood water that would otherwise have occupied the space taken by the raised land. This can increase flood hazard and risk in other locations. The submitter evidence did not appear to provide any further evidence to support their view that if the area were to be rezoned rezoned, a structure plan mapped area be added to the 2GP to manage development on the site rather than a new development mapped area (NDMA).

GF11 and GF11a: Wakari Road area – Rezoning from RR2 to GR1

3 Waters	Comments (Appendix 6 of s32 report)	Comments (response to submitters evidence)
Overall	Ok to rezone (as per Appendix A of Section 32 report)	Ok to rezone.
Potable Water Supply	Some local upstream network upgrades required and are budgeted in the draft 10 Year Plan.	The evidence provided by the submitter, JKS Paddock Limited, does not change our opinion on the provision of water services. We are interested to understand the reasons for the submitter Mr Motion suggesting the need to vest Lot 13 in 312 Wakari Road in Council for future 3 Waters pumping infrastructure. The reasons for this are unclear.
Wastewater	Localised downstream upgrade is required for part of site. Budgeted in draft 10 Year Plan.	The evidence provided by the submitter JKS Paddock Limited does not change our opinion on the provision of wastewater services.
Stormwater	The site discharges to open channels to the north-east and southeast. There is no capacity information for these channels. Attenuation is required to preserve the receiving environment from erosion. The site eventually discharges to Leith Stream, so there may be significant costs to attenuate stormwater to ensure flood hazard for the Leith Stream is not increased. These would be at the developers cost.	The evidence provided by the submitter, JKS Paddock Limited, suggests that some initial thoughts have gone into stormwater management for the site and these initially sound promising in meeting Council's requirements and the concerns of other submitters. The submitter has proposed the application of a RTZ over part of GF11. We can not comment on whether or not a RTZ should be applied. Based on the evidence from the submitter, Mr Motion, and on Council topographical information held online we agree with the submitter's statement that 312 Wakari Road is physically separated from the balance of GF11 in terms of stormwater. We also agree with the submitter that there may be grounds for excluding 312 and 296 Wakari Road from a RTZ, if one were to be applied, with respect to the need for owners to come to agreement on cost sharing for the upgrade of 3 Waters infrastructure. Our view differs from the submitter regarding 280 Wakari Road, which should remain within a RTZ, if one were to be applied, as it is hydrologically connected to the upstream parts of GF11.

GF14: 336 and 336A Portobello Road, The Cove – Rezoning from RR2 to T&S

3 Waters	Comments (Appendix 6 of s32 report)	Comments (response to submitters evidence)
Overall	Ok to rezone (as per Appendix A of Section 32 report)	Ok to rezone, noting that the evidence provided regarding stormwater servicing suggests that what is proposed will not meet new Variation 2 rules for stormwater management. We believe that it is possible to meet the stormwater management rules in the Variation 2.
Potable Water Supply	Water supply could be connected to Highcliff Road instead of Portobello Road to avoid the significant network extension that would be required. There are known issues meeting water supply demand on the peninsula in summer. However, based on the proposed total additional capacity of approximately 100 dwellings on the peninsula (through Variation 2 and 2GP appeals), the impact on the water supply network is considered to be minimal and acceptable.	Information regarding the existing network is correct. The additional information on water servicing for the site details the required network extension. It is in line with discussions although some additional information would be required as part of a resource consent application. Calculations provided appear to be correct and to the correct standards. The submitter has allowed for the inclusion of correction of the existing non-compliant water supply connections for the 9 existing properties. This is appreciated and if the site were to be rezoned, this is something we would want 3 Waters to include. It would also address the concerns of some other submitters who spoke at the hearing regarding existing water supply connections passing through the site but not having easements.
Wastewater	Minimal network extension required. The network model lacks detail on the peninsula, so more detailed investigation is required to confirm whether any downstream upgrades are required. If any are required, they will be relatively minor.	Information regarding the existing network is correct. The additional information on wastewater servicing for the site details the required network extension. It is in line with our expectations. Calculations provided appear to be correct and to the correct standards.
Stormwater	The existing infrastructure is two 300mm diameter culverts below Portobello Road north of the site. The culverts would likely need to be upgraded for capacity and erosion protection for the overland flow path.	We have some concerns with the proposed servicing for stormwater. We do not believe that what is proposed will meet stormwater management requirements as per rules governing GF14 and NDMAs. We do not believe that Policy 9.2.1.Y of the 2GP and associated rules will be met. Our

		concerns are primarily around how what is proposed would meet requirements for stormwater quality. This concern was also raised in the hearing by the submitter residing at 342 Portobello Road. However, we consider that this is achievable, and it does not change our position that this site can be rezoned from a 3 Waters perspective. The submitter presented evidence in the hearing suggesting the requirement for an NDMA over the site be removed. As we believe that the proposal for stormwater servicing is inadequate, we believe that the NDMA should remain on this site if it is rezoned.

10. During the hearing submitters provided evidence which has prompted you to ask for further information as follows:
    - If not already done, can 3 Waters please address how any new water connection would affect existing residents.
        - Please see our response to submitter evidence in the Water Supply section of the table above.

    - If not already done, can 3 Waters please provide comment on if existing proposal would meet Policy 9.2.1.Y.
        - Please see our response to submitter evidence in the Stormwater section of the table above.

    - If not already done, can 3 Waters please advise if they would support not applying an NDMA over GF14 (and why/why not).
        - Please see our response to submitter evidence in the Stormwater section of the table above. We believe that the NDMA should remain on this site if it is rezoned because the proposal for stormwater servicing is inadequate, particularly with regards to stormwater quality. Applying an NDMA over the site would ensure that the associated specific requirements for stormwater management, including stormwater quality would have to be met before development could occur.

RS206, RS206a, RS77: Part 35 and 43 Watts Road, Part 109 North Road – Rezoning from Rural/Rural Residential 2 to General Residential 2/General Residential 1

3 Waters	Comments (provided in s42 report)	Comments (response to submitters evidence)
Overall	Risky site from 3 Waters perspective, mostly due to wastewater and stormwater concerns. Preference would be to exclude.	The submitters evidence has been reviewed. Our initial comments stand, and our position remains the same. We do not support rezoning of the site. As per our evidence, our primary reasons for our position are wastewater and stormwater concerns.
Potable Water Supply	Minor local network extension would be required to connect the site to the existing network and some local upgrades to existing pipes (from 100mm diameter to 150mm diameter). Significant upstream upgrades required.	We agree with the comments made in the submitters evidence regarding water supply. The comments made regarding existing infrastructure are correct, as is the submitters interpretation that there are solutions available for the significant upstream upgrades required.
Wastewater	A minor local network extension would be required to connect parts of the site to the existing network. Immediately downstream of the site wastewater flows enter an infrastructure constraint mapped area (ICMA). Flows enter the trunk main on North Road. There are existing wastewater overflows occurring in wet weather in North Road with discharge to the environment (Lindsay Creek). Additional flows would exacerbate this. Medium to long timeframe for resolving these. Wastewater detention may be a possibility given the number of lots proposed however, the site is split across at least two sub-catchments making this difficult so further investigation would be required to consider this.	The submitters evidence indicates that in the area marked as Area A, 12 lots are proposed that will directly discharge wastewater to the DCC wastewater network and that "it is unlikely that the release of wastewater without detention will have a noticeable effect on the downstream network". We do not agree with this statement. In dry-weather conditions the statement is probably correct however, as noted in our previous evidence there are existing wastewater overflows occurring in wet weather in North Road with discharge to the environment (Lindsay Creek). Our view is that any additional flows would exacerbate this. It is also counter to the principles of Te Mana o te Wai, a fundamental concept of the National Policy Statement for Freshwater Management (2020). In Section 40 of the submitters evidence, they suggest that an alternative would be for each of the 12 lots to have an individual pump system to a wastewater detention tank servicing the larger site. We agree that this is a technical possibility. An example of such systems in use in Dunedin is in Allanton. However, our view on use of such systems

		at this site is that the DCC network capacity issue will be resolved in the medium term at which point, individual pump systems wouldn't be necessary, and the properties could drain wastewater to the DCC gravity network. We believe that individual pump systems are not "good-quality" in the sense envisaged in the Local Government Act 2002. In Section 41 of the submitters evidence, the submitter suggests that a large part, but not all, of the site could be serviced from one wastewater detention tank.
Stormwater	Downstream of the site is Lindsay Creek. Any increase in peak flows could potentially have a negative impact on ORC's level of service for flood protection associated with the Water of Leith. It is assumed that the infrastructure is not easily upgradeable. It is therefore proposed to assess on-site attenuation to meet the 100-year ARI conditions. We have concerns over the affordability of stormwater infrastructure. There is flood hazard to downstream properties identified by ORC flood hazard report (*Flood hazard of Dunedin's urban streams, ORC, 2014*). Potential degradation of Lindsay Creek is counter to principles of Te Mana o te Wai.	The submitters evidence indicates that in the area marked as Area A, individual on-site detention tanks are proposed for stormwater management. It is not clear from the evidence exactly how many lots may be possible in this area. There is some mention of 12 lots in another section of the evidence. While use of individual on-site storage tanks may be appropriate for an area of 12 lots, where there is potential for a significant number of lots and increase in impervious surfaces, we would have concerns over the use of individual on-site storage tanks for stormwater management as they cannot be relied on for long-term performance and the potential impact on stormwater flows can be significant.

RS154: 91 and 103 Formby Street – Rezoning from Rural to Township and Settlement

RS175: 85 Formby Street – Rezoning from Rural to Township and Settlement

3 Waters	Comments (provided in s42 report)	Comments (response to submitters evidence)
Overall	Not supported from a 3 Waters perspective primarily for stormwater reasons but there are also concerns regarding water supply, preference is to exclude. It is also noted that the site sits within a high class soil and Hazard 2 (flood) overlay.	The submitters evidence has been reviewed. Our initial comments stand, and our position remains the same. We do not support rezoning of the site due to water supply issues and stormwater concerns.
Potable Water Supply	There are services at existing boundaries to the site, but these would need to be upgraded. Water supply capacity is constrained during peak summer demand periods with no spare capacity available at these times. Medium to long term timeframe to address this.	No submitter evidence was provided regarding water supply. Concern detailed in our evidence remain the same.
Wastewater	Outram is not serviced for wastewater by the DCC, the site is outside the DCC reticulated wastewater area. An on-site self-servicing assessment has been carried out. Self-servicing for wastewater is considered feasible, pending soil investigations. Consent to discharge treated wastewater would be required from the Otago Regional Council.	No submitter evidence was provided regarding wastewater servicing. The submitters evidence does not mention any contact with the Otago Regional Council or soil investigations regarding wastewater.
Stormwater	The site is flat and there is no obvious natural flow path other than the channel to the north of the site which is an old “ox-bow” of the Taieri River. Stormwater drainage in Outram is complex and constrained. Due to the position of the Taieri flood protection bank there is no natural outlet for stormwater drainage in Outram. Instead, Outram’s stormwater drains to an “ox-bow” lake, at the southern end of Outram and just to the east of the proposed site. From here the stormwater is disposed of through infiltration into the ground. The infiltration capacity of the “ox-bow” lake is	The submitter evidence suggests that stormwater management would be via a pond, swale, or tank and indicates that the structure plan allocates areas for this. However, the structure plan does not indicate any form of stormwater detention or it’s location. The submitter evidence includes some stormwater attenuation volumes and dimensions. The volume calculations are for stormwater attenuation for rainfall event durations of 10 minutes and 120 minutes. The annual exceedance probability (AEP) used is not stated but is believed to be 10% (approximately equivalent to 1-in-10 year). This

	unknown and there have been past rainfall events in which the “ox-bow” lake has flooded. As the capacity of the open channel and “ox-bow” lake is unknown, an on-site attenuation assessment has been carried out. The area of land required for stormwater management is over 30% of the total area of the site and is not considered feasible. Even if stormwater management were feasible at the site, the additional stormwater volumes generated are a risk due to the unknown disposal capacity of the “ox-bow” lake.	would be insufficient to meet the requirements of Rule 9.9.X.4 of the 2GP. It is not clear if the pond will be for primary and/or primary and secondary attenuation. The evidence also states a possibility of stormwater disposal by drainage to ground. We consider drainage to ground as risky due to the unknown soil infiltration capacity of the site or the disposal capacity of the ox-bow lake. It is stated in the evidence that the volumes are indicative and further calculations will need to be undertaken to include additional storm durations. We expect that the required stormwater attenuation volumes are likely to increase. We do not believe that the stormwater management proposed in the evidence will meet the stormwater management policy 9.2.1.Z and rules that are now operative through Variation 2 of the 2GP. The infiltration capacity of the open channel and “ox-bow” lake is still unknown. The submitter’s evidence does not change our opinion regarding stormwater servicing for the proposed site being unfeasible due to the large area of land required and the associated cost for stormwater infrastructure.

11. During the hearing submitters provided evidence which has prompted you to ask for further information as follows:

- What is the water source for Outram? Is it bore water? Where does it originate? What is the population capacity from this supply? Is it the case that the actual water source is constrained (in summer), or is it the pipes carrying the supply into Outram that are constrained?

- The water source for Outram is from a bore which is located approximately 100m from the true left bank of the Taieri River, just upstream of the Taieri River Bridge on State Highway 87, just outside Outram.
- The theoretical population capacity of this supply is 2,880 people based on the treatment plant capacity and Resource Consent for water take of 720 m^3/day and using the theoretical demand of 250 litres per person per day (Dunedin Code of Subdivision 2010, Section 6.11.5).
- The current actual 3-day peak water demand is 760 m^3/day. A 2,270 m^3 treated water reservoir provides some buffer capacity when demand exceeds supply.
- The water source and treatment plant are constrained in summer. Upgrades to the piped water network were carried out in 2015 and 2019 to ensure sufficient capacity in the pipes supplying Outram.

- Can 3 Waters comment at what point/population they would consider implementing a reticulated wastewater supply for Outram? What would it cost?
  - There is currently no defined point or population at which a reticulated wastewater network for Outram would be implemented and costs for doing so aren't known at present. Strategic planning is currently underway for water, wastewater, and stormwater, in the form of System Planning. The System Planning work programme aims to develop investment plans for the next 30-50 years that will enable DCC (or any future water service entity) to meet current standards, adapt to future standards and levels of service for 3 Waters and to achieve its affordability obligations to customers. System Planning considers all of Dunedin, including Outram.
  - System Planning is taking factors such as capacity, performance, growth, new standards, environmental impacts, climate change, Carbon Zero and community outcomes into account. As part of the System Planning process the drivers, costs, and benefits of differing levels of service will be assessed, including the implementation of a reticulated wastewater supply for Outram. This will form the basis of any future business case for such an implementation.
  - As the outputs of System Planning become available, longer term strategic investment plans will be incorporated into the 10 Year-Plan 2024-34. Should a future water service entity be established as part of the 3 Waters Reform, 3 Waters intends to attempt to incorporate longer term strategic investment plans resulting from System Planning into the investment plans of the future water service entity.

- One option proposed by the submitter is to pump wastewater from the site (possibly with some initial treatment) to Allanton (which has a reticulated wastewater system). From Allanton, it could be pumped back to Mosgiel through the existing system. Would 3 Waters have comment on this proposal? Any comment on the cost?
  - The nearest point at which Outram wastewater could be connected to the Allanton to Mosgiel wastewater pipeline is at minimum 4.2km from Outram.

- It would be a poor infrastructure outcome to construct a pipeline that has capacity only for this site and not for all of Outram. It would also raise questions over differing levels of service for wastewater servicing for the Outram community. Therefore, we believe that if such a pipeline were constructed it would be sensible to size the pipeline to convey all of the Outram community's wastewater.
- While the Allanton to Mosgiel wastewater pipeline may have capacity to convey wastewater for this site alone (further investigation would be required), our opinion is that the Allanton to Mosgiel wastewater pipeline would not have capacity for all the wastewater generated in Outram. Further investigation would also be required to assess whether the Mosgiel Wastewater Treatment Plant would have capacity to treat all of Outram's wastewater.
- Using the Allanton to Mosgiel wastewater pipeline to convey wastewater from this site takes away capacity to service further growth provided for in the current Township & Settlement zoned area of Allanton.
- Based on the estimated number of lots the site would provide and unit rates for DCC infrastructure, capital costs per lot are estimated to be similar to that for individual on-site wastewater treatment and disposal systems that treat effluent to a secondary standard. As DCC has no plans for such infrastructure, if development of this land and the installation of the proposed infrastructure were approved by Council, costs would likely be the responsibility of the developer.
- We do not believe that the proposal to pump wastewater from just this site to Allanton could be considered "good-quality" infrastructure in the sense envisaged in the Local Government Act 2002.
- As noted above the 3 Waters System Planning programme will consider the implementation of a reticulated wastewater supply for Outram including options such as connection to Mosgiel Wastewater Treatment Plant along with costs and benefits.

- Regarding stormwater, can 3 Waters please provide comment on the calculation in the evidence of Mr Horne (RS154,-RS175_CC-Otago-Ltd,-P-Doherty,-Outram-Developments-Ltd_S305,-307,-308-_-Evidence-C-Horne.pdf (dunedin.govt.nz))?
  - Please see our response to submitter evidence in the Stormwater section of the table above.

- Can you please provide comment on whether subdivision-based communal wastewater systems are generally supported? Are these generally maintained by the developer/residents, or are they vested in DCC?
  - We do not support subdivision-based communal wastewater collection and disposal systems. In other regions of New Zealand where these are supported, they are generally privately owned. Our primary reasons for not supporting subdivision-based communal wastewater collection and disposal systems are:
    - They typically have higher operation and maintenance costs on a per serviced lot basis, compared to larger municipal systems. This results in higher costs for ratepayers when they are in Council ownership.

    - Where privately owned (e.g. through body corporate) they are not supported because they are often poorly operated, maintained and monitored. Often the private owners do not have the capacity or capability to operate and maintain the system properly, or the financial

resources to sub-contract operation and maintenance to specialised contractors. Councils are often eventually asked to take over the system, or Council has to step in to operate and maintain the system properly. When this happens the systems generally require a lot of work and investment to bring them up to Council standards. This has occurred in cases outside of Dunedin.

- Can 3 Waters please provide commentary about the implications, with respect to this site, if storms are to increase in frequency and size as a result of climate change? How does this effect proposed stormwater management?
    - The stormwater management policies and rules that are now operative through Variation 2 of the 2GP include requirements to ensure that stormwater generated by the activity has no more than minor adverse effects on it or on other sites (Policy 9.2.1.Z and Rule 9.9.X). As part of this, changes to rainfall frequency and intensity as a result of climate change need to be accounted for in any stormwater management plans and stormwater infrastructure.
    - For New Development Mapped Areas (NDMAs) stormwater management policy and rules (Policy 9.2.1.Y and Rule 9.9.X) specifically state requirements that must be met to ensure that stormwater management accounts for changes to rainfall frequency and intensity as a result of climate change. If either or both of RS154 and RS175 were rezoned we would recommend that an NDMA be placed over the rezoned area.

- One of the submitters mentioned that 3 Waters was planning on undertaking a strategic look at Outram. This was meant to occur prior to end of 2021. Can comment be provided on this/its status?
    - We believe that the submitter is referring to the System Planning programme detailed in our responses above. The System Planning programme commenced in late 2019 and considers all of Dunedin, including Outram. Much of the time to date has been spent in identifying and filling data gaps to ensure that the strategic planning is robust. Initial data capture was used to inform 3 Waters investment plans for the 10 Year-Plan 2024-34. Data gathering is nearing completion and work on developing and assessing strategic responses will commence in early 2023. As the outputs of System Planning become available, longer term strategic investment plans will be incorporated into the 10 Year-Plan 2024-34. Should a future water service entity be established as part of the 3 Waters Reform, 3 Waters intends to attempt to incorporate longer term strategic investment plans resulting from System Planning into the investment plans of the future water service entity.

RS195 (Part 774 Allanton-Waihola Road)

12. During the hearing you asked us to review and provide brief comment on evidence provided by the submitter. Comments are provided in the tables below. These comments are based on the submitters proposed zoning of Township & Settlement for the entire site.

13. There has been no previous 3 Waters infrastructure assessment for this site.

3 Waters	Issue Grade (minor / moderate / major)	Comments (response to submitters evidence)
Overall		Risky site from 3 Waters perspective, for all 3 Waters. Wastewater servicing may be expensive and technically challenging. Stormwater management may be expensive. Further investigation is considered necessary. Preference is to exclude.
Potable Water Supply	Significant issues (manageable)	The site is outside of the area serviced for water supply by DCC. Adjacent Allanton is self-serviced for water. The site is not considered feasible for self-servicing, however it is acknowledged that existing adjacent sites in Allanton at the same zoning are already self-serviced for water supply. The adequacy of the existing self-servicing in Allanton and how much tankered water top-up is required by existing residents is unknown. The evidence presented does not support any firefighting water capacity.
Wastewater	Significant issues (may not be manageable)	The submitter proposes three options for wastewater servicing for the site: (a) the treated wastewater is discharged to a constructed wetland within the site, located out of any mapped flood hazard area; (b) the treated wastewater is pumped via the existing reticulated wastewater system in Allanton with the ability for the treated wastewater to be held to be pumped at off-peak times if there is an issue with capacity during peak times (c) a combination of the two. Regarding option a), soil drainage information sourced from Landcare Research (S-Map Online) indicates that the soils on the site are poorly drained. A high level self-servicing assessment indicates that a significant area of the site would be required for land disposal. This may make the option unfeasible. Option a) also suggests that the wastewater would be collected by a reticulated system for communal treatment and disposal. It is not clear from the submitter evidence, whether such a system would be proposed to be vested in Council or privately operated. We do not support subdivision-based communal wastewater collection and disposal systems.

		Regarding option b), west of the site location is Allanton and a potential service connection to the wastewater scheme. The Allanton wastewater scheme is a pressure sewer scheme with individual pump stations for each lot discharging to a rising main to the Mosgiel Wastewater Treatment Plant (WWTP). Given the number of lots proposed for the site it is possible that the rising main to the Mosgiel WWTP does not have capacity for the additional wastewater volumes. A more detailed analysis would be required for confirmation. While the submitter indicates that such a system would have the ability for treated wastewater to be held if there is an issue with capacity during peak times, no such systems are in operation in Dunedin and such systems are not easy to establish. More detailed analysis would be required. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy. We do not support the rezoning of any areas that require additional pumping. Consent to discharge treated wastewater would be required from the Otago Regional Council. The submitter's evidence does not mention any contact with the Otago Regional Council regarding wastewater.
Stormwater	Some issues (manageable)	There is no stormwater network in the area. The site is adjacent to the Taieri River and parts of the site are in a Hazard 1 flood overlay zone. The submitter's structure plan suggests that stormwater management may be possible. If the site were to be rezoned an NDMA should be placed over the area so that Policy 9.2.1.Y and Rule 9.9.X must be met before consent can be granted.

RS109 – 119 Riccarton Road West

14. During the hearing you asked us to review and provide brief comment on evidence provided by the submitter. Comments are provided in the tables below.

15. There has been no previous 3 Waters infrastructure assessment for this site.

16. We note that the submitter is proposing LLR2 zoning resulting in four lots and would self-service for water supply, wastewater, and stormwater.

3 Waters	Comments
Overall	Although DCC 3 Waters would not service this site with 3 Waters infrastructure our high-level assessment suggests that there are no significant issues for self-servicing of water supply, wastewater, or stormwater.
Potable Water Supply	A high-level self-servicing assessment indicates that water supply is constrained, however, self-servicing may be possible in this zoning. Sufficient water storage or sprinkler systems to provide firefighting water supply that meets the Firefighting Water Supplies Code of Practice NSZ4509:2008 would be necessary.
Wastewater	Soil drainage information sourced from Landcare Research (S-Map Online) indicates that the soils on the site are imperfectly drained to well drained. A high-level self-servicing assessment indicates that self-servicing for wastewater is feasible given the LLR2 zoning and land area available for wastewater disposal.
Stormwater	There is no stormwater network in the area. There is an ORC Scheduled Drain, M2, at the intersection of Riccarton Road West and Bush Road. There are roadside table drains that appear to lead to the Scheduled Drain, however, the capacity of the table drains and Schedule Drain are unknown. On-site attenuation would be likely to be required. The site is within a Hazard 3 flood overlay zone.

RS212 – 170 Riccarton Road West

17. During the hearing you asked us to review and provide brief comment on evidence provided by the submitter. Comments are provided in the tables below.

18. There has been no previous 3 Waters infrastructure assessment for this site.

19. A number of zonings have been proposed by the submitter as follows:
    - LLR1 = 31 dwellings
    - LDR = 71 dwellings
    - GR1 – 100-140 dwellings

20. We note that the Panel also asked if we were able to provide any comment on stormwater capacity and overland flows for this area. The Panel also asked, in broad terms, what is the ability to service this area for both wastewater and potable water supply?

3 Waters	**Issue Grade (minor / moderate / major)**	**Comments**
Overall		At LLR1 - Although DCC 3 Waters would not service this site with 3 Waters infrastructure our high-level assessment suggests that there are no significant issues for self-servicing of water supply, wastewater, or stormwater. At LDR or GR1 - Not supported from a 3 Waters perspective for wastewater and water supply reasons, preference is to exclude.
Potable Water Supply	At LLR1 - Some issues (manageable) At LDR or GR1 - Significant issues (manageable)	At LLR1 zoning the submitter proposes self-servicing for water supply. A high-level self-servicing assessment indicates that water supply is constrained, however, self-servicing may be possible in this zoning. Sufficient water storage or sprinkler systems to provide firefighting water supply that meets the Firefighting Water Supplies Code of Practice NSZ4509:2008 would be necessary. At LDR or GR1 zoning water supply servicing from DCC's water network would be required. The site has an existing 25mm diameter water connection. This would require upgrading to feed the site. Mosgiel water supply is currently constrained during dry hot summer periods and this would be exacerbated by further development. Significant

		upstream network upgrades required and will be medium term timeframe to resolve. This timeframe is unlikely to match the developers.
Wastewater	At LLR1 - Some issues (manageable At LDR or GR1 - Significant issues (not considered manageable)	At LLR1 zoning the submitter proposes self-servicing for wastewater. Soil drainage information sourced from Landcare Research (S-Map Online) indicates that the soils on the site are imperfectly drained to well drained. A high-level self-servicing assessment indicates that self-servicing for wastewater is feasible given the LLR1 zoning and land area available for wastewater disposal. It is noted that a significant part of the site is covered by a Groundwater Protection Mapped Area, and consent from ORC would be required for lots to self-service for wastewater. At LDR or GR1 zoning wastewater servicing from DCC's wastewater network would be required. A wastewater main is located approximately 500m east of the site, on Bush Road. Significant downstream upgrades are required as the network and treatment plants have issues in wet weather events. Medium to long term to resolve. The site is at a lower elevation to the potential wastewater network connection point therefore pumping would be required. 3 Waters prefers gravity to pumping where possible due to lower operating and maintenance costs and supporting DCC's Zero Carbon policy.
Stormwater	Some issues (manageable)	There is an ORC Schedule Drain, M2, that run to the south and west of the property. The capacity is unknown so it is expected that on-site stormwater attenuation would be required. There are roadside table drains to the south and west of the site which are likely to connect to the ORC Schedule Drain. The site is relatively flat and the direction of overland flowpaths is likely to be to the southwest although further assessment would be necessary to confirm this. The site is within a Hazard 3 flood overlay zone.

RS157 – 90 Blackhead Road and surrounds (specifically 70 Green Island Bush Road)

21. During the hearing you asked us to review and provide brief comment on evidence provided by the submitter. Comments are provided in the tables below.

22. There has been no previous 3 Waters infrastructure assessment for this site.

23. We note that the submitter is proposing LLR2 zoning and would self-service for water supply, wastewater, and stormwater.

24. You have requested us to provide any comment on if, from a 3 Waters perspective, the general Blackhead area could be considered for GR1 zoning in the future.

3 Waters		**Comments**
Overall		At LLR2 - Although DCC 3 Waters would not service these sites with 3 Waters infrastructure our high-level assessment suggests that there are no significant issues for self-servicing of water supply, wastewater, or stormwater. At GR1 – significant 3 Waters infrastructure would be required to connect the area to the existing networks. Other potential infrastructure could include treated water reservoirs, pump stations and stormwater attenuation. Further assessment would be necessary to consider the feasibility of GR1 zoning in the future.
Potable Water Supply	At LLR2 - Some issues (manageable) At GR1 - Significant issues (manageable)	At LLR2 - A high-level self-servicing assessment indicates that water supply is constrained, however, self-servicing may be possible in this zoning. Sufficient water storage or sprinkler systems to provide firefighting water supply that meets the Firefighting Water Supplies Code of Practice NSZ4509:2008 would be necessary. At GR1 - significant water infrastructure would be required to connect the area to the existing water network. Treated water storage reservoirs may also be required. Significant upstream network upgrades would be required. These would be long-term to complete. Our preference is to exclude and focus on upgrading existing networks to remove existing constraints and provide further capacity for growth within existing residential zoned areas.
Wastewater	At LLR2 - Some issues (manageable	At LLR2 - Soil drainage information sourced from Landcare Research (S-Map Online) indicates that the soils on the site are imperfectly drained. A high-level self-servicing assessment indicates that self-servicing for wastewater is feasible given the LLR2 zoning and land area available for wastewater disposal.

	At GR1 - Significant issues (manageable)	At GR1 - significant wastewater infrastructure would be required to connect the area to the existing wastewater network. Flows would likely go towards Green Island Wastewater Treatment Plant which may require capacity upgrades depending on the area and number of lots that would be serviced. Some pumping may be required.
Stormwater	Some issues (manageable)	There is no stormwater network in the area. 90 Blackhead Road and 70 Green Island Bush Road both discharge via various overland flow paths eventually reaching the Kaikorai Stream. 90 Blackhead Road also has site discharges via various overland flow paths predominantly southwest to the coast through coastal bushland. In order to protect the receiving environment from erosion and contamination it would be necessary to attenuate flows. Stormwater attenuation would also be required if the area were developed to GR1.