Akaroa wastewater scheme – consultation results

Option 1 - Year-round irrigation to trees
Option 2 - Year-round irrigation to pasture
Option 3 - Summer only irrigation, with wetland or infiltration basin and discharge via a coastal infiltration gallery at other times
Option 4 - Subsurface flow wetland and discharge via a coastal infiltration gallery
Option 5 - Infiltration basin and discharge via a coastal infiltration gallery
Option 6 - Previously proposed mid-harbour outfall

Results Summary
Option 1 – 17 (21%)
Option 2 – 3 (4%)
Option 3 – none (0%)
Option 4 – 1 (1%)
Option 5 – none (0%)
Option 6 – 35 (43%)
Not indicated – 25 (31%)
Total 81 submissions

Option one:

Indicated option one, year round irrigation to trees as their first option – 17 submissions (21%)

No.	Submitter ID #	City	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Please state your reason for this ranking order	Other comments	Project Team Responses
1.	74	Akaroa	1						We believe Option 1 is the only one worth considering, but would prefer only Blocks A, B, C and E to be used. This would be sufficient for the required 25 hectares. This would be an excellent opportunity to provide for the disposal of recycled water and to use a valuable resource to assist with the regeneration of the original land cover.	It would be an extra bonus to extend this irrigation (in the future), in a controlled way (to only be used during dry spells in the summer), to assist with the reestablishment of native bush on the slopes between the West End and Lushingtons Bay. This would eventually smother the gorse and help to prevent further erosion.	Your submission is noted.
2.	26		1						I am only in favour of option one as any discharge into the sea is unacceptable. Irrigation to pasture is not suited to the Akaroa Landscape.	Our family regularly kayak, swim and walk in the Takamatua area. Any discharge into the coast would greatly affect our enjoyment and ability to do so. We must protect this beautiful coast. ...I sometimes think the Council doesn't realize what a gem Banks Peninsula is....the whole of Banks Peninsula...not just Akaroa.	Your submission is noted.
3.	15		1						Of the options available I believe this to be the best. I do not agree to putting a "rank" to any option that involves discharge to the sea	I frequently visit Takamatua both on land and at sea and would not want any discharge to the sea. I have no problem with a properly designed land discharge. I would like the CCC to consider the inclusion of a wetland prior to irrigated to trees. The wetland would be operational very quickly and possibly allow for discharge to trees sooner than the 5 years that has been suggested.	A wetland in addition to irrigation to trees would add substantially to the cost of the project. The limiting factor for the amount of irrigation to trees in the first few years is the lack of an established canopy to intercept rainfall. Passing treated wastewater through a wetland upstream of irrigation to trees would have no effect on the amount of wastewater that could be irrigated to trees before the canopy established.
4.	19	Christchurch	1	2	5	3	4	6	Most ecologically sound		Your submission is noted.
5.	25		1						I am not ranking this. It does not in any way determine an appropriate system democratically.	We should be doing everything we can to prevent contaminated water from entering the harbour.	Your submission is noted.
6.	24		1	3	4	5	6	2	Being users of Takamatua Bay we do not wish to see the waste pumped into our area and feel if it is to be pumped anywhere it should stay on the Akaroa side when the waste is coming from that area. Given That this option is unlikely to progress then the planting of native trees on the hills would be a better option.	We have concerns regarding any flooding or excess water option one may cause which could come down the hillside to our property in Takamatua. There can already be a lot of water run off from the hills and we have concerns this could increase this and potentially cause flooding. We also have concerns that the water sitting around the trees may cause mosquitos or midges to linger and breed in that environment. Obviously research has been done on all alternatives available but we are not happy that Takamatua	We note your concerns about runoff from land above your property. Subsequent preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer

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										who have to deal with their own waste water now have to deal with Akaroa's waste water too.	considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
7.	34		1	2	3	4	5	6	Best is land irrigation, worst is harbour discharge	The technical reports do not seem to have considered the growing problem of microplastic pollution which is known to occur in Akaroa and which is not filtered out in sewage treatment. This is a serious issue if the final decision is for harbour discharge. Please contact me if you would like reference material on this matter.	A recent study of the performance of wastewater treatment plants in New York State, USA, found that 6 out of 9 membrane filtration plants were effective in removing microbeads. These plants employ the same technology as that proposed for Akaroa. Based on this study it is anticipated that the membrane-based treatment plant proposed for Akaroa will be at least partially effective in removing microbeads.
8.	35	Akaroa	1	2	4	5	6	3			Your submission is noted.
9.	1	Akaroa	1	2	3	5	4	6	Opposed to harbor discharge where possible. The tree option could be nuts,fruit or firewood copse to help offset costs and provide work for the unemployed or volunteer groups. Second choice would be a mix of trees and pasture which would also offset some of the costs.	The permanent population of Akaroa is unlikely to increase dramatically because of lack of suitable building sites, and tour ships will slow once Lyttelton is up and running, so only peaks will be in summer from holiday visitors. Therefore should be no large demand for irrigation in winter months.	Population forecasts have been taken into consideration with the design and this includes the permanent population and tourists.
10.	6	Wellington	1	2	3	4	5	6	The ranking relies on the statements in the Akaroa Treated Wastewater Disposal Options consultation document about the quality of the treated waste water from the Treatment Plant. If it is not virtually clear water etc. then the ranking order would need further consideration. We do not want discharges into the harbour if it will affect the shellfish and aquatic life. We are less concerned about the capital cost since the effects of a badly designed or operated scheme will have much larger cost impacts on the community. see comments below: Akaroa Treated Wastewater Disposal Options Consultation Comments to added on Submission Form (on behalf of Bruce and Jane McLean - owners of 80 Woodills Road, Akaroa; and Akaroa Developments Limited owner of 72 Woodills Road and 3,6,7,8,9,10,11 and12 Felthams Road, Akaroa): Our preference is for Option 1 in the first instance or, if preferred by the landowners, a hybrid of Option 1 and 2. We would prefer to avoid discharging treated wastewater into Akaroa Harbour. This preference is based on the assumption that the treated wastewater will be as described in the consultation document: "virtually clear water that looks just like tap water and has almost all of the bugs (bacteria and viruses) killed off. The treated wastewater will be safe for irrigation or watering the garden". As property owners with a number of residential properties relatively close to the proposed wastewater treatment activity we suggest that some independent environmental, technical and operational assurance is provided to the residents of Akaroa and Takamatua. We suggest one or more internationally experienced peer reviewers are engaged to provide satisfaction that: • The proposed treatment plant and irrigation system is suitably designed and installed and will perform to best international practice for similar systems • The treated wastewater exiting from the plant will be as promised - i.e. is "virtually clear water that looks just like tap water and has almost all of the bugs (bacteria and viruses) killed off and is safe for irrigation or watering the garden". • That sufficient redundancy and backup systems are designed into the system to allow for periodic heavy inflows, plant		Resource consents have already been granted for the wastewater treatment plant, so this is not part of this consultation. Through the consent process, the design of the wastewater treatment plant was peer reviewed. The Council will obtain a peer review of the irrigation scheme if this is the preferred option.

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									downtime, maintenance, blockages, flooding and other potential adverse events. • That adequate maintenance provisions have been allowed for to keep the plant at optimum operational level • That sufficient geotechnical investigations have been completed • That any odours emitted do not adversely impact nearby residential properties under any circumstances • The planting regime selected is suited to the particular site and will positively add to the environment. We consider the appointment of the suggested peer reviewer(s) and oversight of the peer review be undertaken jointly by a working group consisting of representatives of the Akaroa community (including the land owners affected by the irrigation scheme), Ngai Tahu and the Council. The costs of the peer review would be met by the Council.		
11.	4	Banks Peninsula	1	2	4	5	3	6	I think the first option (1) is a great deal better than all the others. I agree with Ngai Tahu about using the sea for bodily wastes. To have a block of native trees irrigated by the waste water would be a very positive thing for our biodiversity. Being a Harbour it is not desirable to have waste water entering it when there are other options.		Your submission is noted.
12.	11	Christchurch	1	2	4	5	6	3	My preference is to avoid any outfall to ocean and I feel enhancing the number of native trees in the area would be environmentally beneficial, hence my choice of option 1 and if this is not possible, then option 2. However, if neither of these is possible I would then prefer a deep harbour outfall with good diffusion of the treated water. My least favoured options are those with a coastal infiltration gallery off Takamatua peninsula due to the potential it poses for water contamination for swimming, kayaking and shellfish collection. We own a bach at Takamatua and this is our playground and that of the Takamatua community as well as many day visitors, particularly in the summer. I am strongly against "Pipeline Option A" along the Takamatua foreshore as this would be unsightly and if it leaks or breaks would potentially present a contamination risk to a heavily used area.		Your submission is noted.
13.	5	Banks Peninsula	1	2					I support the idea of not contaminating our harbour, & that waste water could be used to enhance our environment for future generations.		Your submission is noted.
14.	26	Akaroa	1	2	3				Options 1, 2 and 3 present difficulties because of the geology of the land in this area. The slopes are variable and the soils comprise poorly draining clay and are riddled with under-runners. The water may be useful in dry conditions but would cause problems of run-off and land slipping in wet conditions. We have experienced this already on our own property as a result of CCC water supply pipe leakage above our property. Water can (and frequently has) run underground and undetected for considerable distances in this area. A number of the proposed disposal sites are within the catchment area of our water supply and this does not appear to have been taken into account. Driplines located above ground would be exposed to damage from vermin and any leaks caused by damage would result in run-off to properties below. Maintenance would need to be frequent and continuous. Mosquitos breed in sitting water so would need to be		We note your concerns about land instability on Takamatua Peninsula. Subsequent preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. There will be no standing water and so mosquitos will not be an issue.

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									controlled. The proposed set-back from residential areas or waterways seems woefully inadequate given these concerns. Extensive soil testing would need to be carried out before any irrigation method is considered. Options 4, 5 and 6 all involve the potential of contamination to our beautiful bay and harbour and are unacceptable because of that. The harbour is a food source and frequently used for recreation for many. A system that distributes waste water to land is certainly the most acceptable option on the condition that suitable land can be found. This does not appear to be likely in Takamatua.		
15.	52	Akaroa	1						My submission is: I have had the opportunity of working alongside Onuku Runanga for more than sixteen years regarding the protection of the land at Takapuneke. It was clearly evident the location of the rubbish tip at the top of the site and the waste treatment facility along the shoreline were inappropriate in the context of the historic importance of the land and in light of the culture significance and sensitivity which it represents and embodies. I fully support Onuku Runanga's concern in that the any future wastewater treatment must be land based and that no discharge should be allowed to enter the Akaroa Harbour. My preferred option is number 1 in the Council's consultation document. Treated wastewater should be irrigated onto soil beneath trees. I would also like to suggest that in several decades time the treated water may be required to support or supplement existing water resources. The new wastewater treatment facility should be built to a high standard to accommodate the requirements of Akaroa and surrounding countryside well into the future. I am aware that Christchurch City Council has funded numerous projects including cycleways and walking tracks for urban ratepayers. The residents of Akaroa require basic infrastructure such as a well designed and functioning wastewater treatment facility capable of accommodating the needs of ratepayers and visitors to the area for this and future generations. Thank you for the opportunity of commenting on this important project.		The Council has resolved on 8 December 2011 that "The new treatment plant be designed to produce wastewater that achieves the best quality wastewater available at the time, and that the design of the plant enable the potential future beneficial re-use of treated wastewater for domestic, commercial or agricultural purposes."
16.	45		1						My name is Fiona Buchan-Ng and I speak on behalf of my whanau. My whanau have been part of the Takamatua community for more than 60years, so we speak with a lot of local experience and knowledge. Our 1950s bach is almost the last of its kind in the bay that is still standing. It is a true iconic no frills kiwi bach. My parents were World War 2 veterans who purchased in Takamatua because they were seeking a clean peaceful private community based existence so that they could heal from the trauma of the war in Europe. They found solace amongst other bach owners in the bay who were also World War 2 survivors. Together the community in Takamatua has created a strong, healthy and caring environment. This togetherness has gone down through three to four generations, and each generation has learned to care for the environment. We gather our food from all over Akaroa harbor, and have done for 60+years. It was nothing to gather		We note your concerns about land instability on Takamatua Peninsula. Subsequent preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. The land at the summit is too steep for irrigation of treated wastewater. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.

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									pippies, cockles, crayfish, flounders, pauas, muscles, cod and oysters and eat together as a community on the beach sharing our kai. Every day there is a beautiful dawn chorus. The dolphins and skates prefer to come in to our part of Takamatua at certain times because they know they can eat in peace. Every day our beach is healthy and safe enough for us all to swim and play in the water. We still have a big patch of Neptune's necklace, lots of crabs, cats eyes and periwinkles all along our rocky beach. Very few people disturb our part of the beach because it is so rocky. My parents would turn over in their graves at the very idea that wastewater from Akaroa could be disposed of in Takamatua. Overall: There is not enough information provided supporting the options presented to us. This is far from satisfactory that the Council expect us to give indications when there is little information. At this stage none of the supplied options are acceptable. Each option would need considerable shifting of the soil which would only serve to further destabilize an already unstable area. Each option would need a robust maintenance and repair scheme and would be very weather dependant. Each option would require fencing and further intrusion in to the Takamatua community. We are not convinced that the treated wastewater would have no impact on the environment. No matter how much filtering and treating there is still the probability that at some stage the system will fail causing pollution to the environment. However, if we were to choose it would be option 1,2, and the hybrid on the proviso that a lot more information is supplied and a lot more work done to ensure that there are no other options. All around the Peninsula that are no two areas alike. What is working in Wainui and Duvauchelles does not mean they will work in Takamatua. Our soils and slopes are completely different. Option 3 to 5 we strongly disagree with. Our reasons are as follows: · Everyone in Takamatua regularly walks out to the headlands for the scenery, peace and quiet. We do not want the visual, aural and air pollution that would happen with pumps, fencing, smells, mosquitoes, and any visual eyesores. · The headland is a prominent part of the harbor and should not be disturbed. · The below the headland is also a great source of food for the community. · The headland would not be able to support the proposed ponds, as evidenced by the many large slips that have occurred in that area. · The land along McRaes road is extremely unstable, with each beachfront property having large under runners. It would be a difficult and costly exercise to put a pipeline along the road reserve. Maintenance of these pipelines will be difficult. The		

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									land is always slipping and this will cause damage to the pipes and a danger of the "Threadbo effect" where slow water leakage over a long period of time will cause major slips to beach front properties. (Can the Council afford to compensate those who have beach front properties and boatsheds when this happens?) Trees would need to be taken out further destabilizing the area, and making beach front properties even more vulnerable. · Weather patterns can be extreme. Some years the soil is very dry, and other years we have massive rainfalls. · We disagree with the Councils assumption that the coast around the end of Takamatua is not widely used. Many people kayak and walk all the way around to Lushingtons Bay at low tide. In closing: 1. We suggest that the council look further in to pumping the wastewater up Long Bay road and irrigate it along the summit.		
17.	66	Christchurch	1	2	6	6	6	3	The Canterbury District Health Board is responsible for promoting the reduction of adverse environmental effects on the health of people and communities and to improve, promote and protect their health pursuant to the New Zealand Public Health and Disability Act 2000 and the Health Act 1956. These statutory obligations are the responsibility of the Ministry of Health and, in the Canterbury District, are carried out under contract by Community and Public Health under Crown funding agreements on behalf of the Canterbury District Health Board. The Ministry of Health requires the submitter to reduce potential health risks by such means as submissions to ensure the public health significance of potential adverse effects are adequately considered during policy development. We welcome the opportunity to comment on the Akaroa Treated Wastewater Disposal Options. We supported the granting of the Akaroa wastewater consents in our submission dated 11 December 2014, provided conditions were adequate to protect the health of people and communities. We also noted that the new treatment plant would be designed to a high quality wastewater suitable for land application and that this disposal method is preferred by the local runanga who felt that discharge to Akaroa was culturally unacceptable. There are also very good reasons why a land-based option could be a preferred option purely from a public health perspective, so the CDHB supported the continued investigation into land based irrigation trials with an aim for this becoming a viable option in the future. We welcome the continuation of this process and the opportunity to contribute to it.		Regarding your comments on Option 1, the storage pond would be appropriately sized and located. The irrigation scheme would be located on land that was less than 15º slope, in accordance with the recommendations from technical experts. Any irrigation would be downstream from drinking water supply takes. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. If the Council's preferred option is the harbour outfall (Option 6) then a cultural impact assessment could be requested from Ngai Tahu. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. Thank you for your suggestion of a formal Health Impact Assessment (HIA). The need for this will be considered once the Council has selected its preferred option.

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									Health and wellbing (overall quality of life) is influenced by a wide range of factors. These influences can be described as the conditions in which people are born, grow, live, work and age, and are impacted by environmental, social and behavioural factors. They are often referred to as the 'social determinants of health', the various influences on health are complex and interlinked. Respect for, and adherence to, a community's cultural values are an important determinant of health. As a division of CDHB, Community and Public Health (CPH) is committed to ensuring positive Maori health outcomes and reducing inequalities. The CDHB continues to acknowledge the concerns of Ngai Tahu (Runanga Onuku, Runanga Wairewa, Te Runanga o Ngai Tahu and the Akaroa Taiapure Management Committee) expressed in their submission on the Akaroa Wastewater Scheme upgrade. CDHB are also aware that the then proposed outfall would be contrary to the Mahaanui Iwi Management Plan in the Plan specifically opposes any discharge of human waste, treated or otherwise, in Akaroa Harbour. The CDHB would support a cultural impact assessment of the proposed options. Recommendation: CDHB support the upgrade of the Akaroa Wastewater Treatment System. The CDHB has considered the six proposed options and has ranked them, but with important caveats: Option 1 – Year-round irrigation to trees This is the CDHB's preferred option as it presents the least risk to public health, subject to the following conditions: I. That there is sufficient headland to provide enough water for an adequate storage pond, with enough land for an adequate storage pond. II. That the land used is level, has the appropriate geological substrata to support such a disposal scheme, and is of sufficient area to prevent overflow. III. That local drinking water intakes (especially Takamatua) are not put at risk by this land based treatment option. IV. That water pooling does not create a breeding environment for mosquitos. Option 2 - Year-round irrigation to pasture This is the CDHB's second most preferred option, as there is a slight risk to public health from spray drift. Option 6 – previously proposed mid-harbour outfall This is the CDHB's third most preferred option, as there is a small risk to public health through shellfish contamination. As this option (and subsequent options below) is culturally unacceptable to Ngai Tahu, the CDHB would support a cultural impact assessment of this option, led by Ngai Tahu,		

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									so that this option could be weighed against the options more preferable to Ngai Tahu. Options 3, 4 and 5 Summer only irrigation, with wetland or infiltration basin and discharge via a coastal infiltration gallery at other times. Subsurface flow wetland and discharge via a coastal infiltration gallery. Infiltration basin and discharge via a coastal infiltration gallery. These are the CDHB's least preferred options, as a coastal infiltration gallery presents the greatest public health risk through contact recreation or shellfish contamination. It is acknowledged that this risk is still small. A more detailed analysis of the public health risks could be presented following a formal Health Impact Assessment (HIA), which the CDHB would support and lead if it was considered necessary, and if the appropriate time and resource was made available to carry out the HIA thoroughly. Conclusion Thank you for the opportunity to comment on the Akaroa treated wastewater disposal options. We welcome the opportunity to discuss the possibility of a HIA further with you and may be in a position to offer some assistance.		

Option two:

Indicated option two, year round irrigation to pasture as their first option – 3 submissions (4%)

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1.	80	Christchurch	3	1	4	5	6	2	I believe that the irrigation to pasture is the best option as the wastewater will have the largest area to soak in and disperse. My option 2 would be for an extended harbour outfall out past the Heads.	I think all available land under 15º slope on the whole Takamatua/Akaroa Peninsula should be considered as a dispersal zone not just the northside facing Takamatua Bay.	The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008), and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. The south side of Takamatua was discounted due to the instability of the land. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.

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2.	14	Christchurch	2	1	3	4	5	6	Water-based options for waste water are offensive given that Akaroa Harbour is a protected marine reserve. Use the water for some good, preferably for pasture rather than trees, given the risk of slips on the peninsular if the root systems become waterlogged (e.g. above the lighthouse in Akaroa, where there is significant erosion and exposure of roots of very old trees).		Only part of Akaroa is marine reserve, this is by the heads on the eastern side.
3.	13	Christchurch	2	1	3	4	5	6	The most beneficial use of properly treated wastewater	(Comments enclosed with the submission form from Children's Bay Holdings Limited which owns 145 hectares of land on the Takamatua Peninsula) The abovementioned land is mainly farm land primarily for raising Angus cattle for the export meat trade. Areas within the farm have been developed into a Manuka plantation, a redwood plantation, numerous areas of native plantings and a walking track which is open to the public. The Company would prefer option 2- Year round irrigation to pasture provided that the quality of the treated wastewater to be discharged meets all the requirements of the meat export industry. If our land is to be used as a discharge area then a hybrid option utilising some irrigation to trees and some irrigation to pasture may be practicable given the number of trees already planted on our land. It is our view that the proposed treatment systems should be peer reviewed by independent internationally recognised environmental engineers to ensure that (a) The design and installation is of the highest world class standard. (b) No odours will be emitted. (c) Wastewater being discharged will constantly be the high quality water described in the consultation document. (d) There will be no possibility of the disposal land becoming contaminated. (e) Suitable back-up systems will be in place to allow for periods of heavy inflow, plant maintenance and adverse weather events. A working group of representatives of the Akaroa community, landowners whose land has been identified as suitable for land treatment options, Ngai Tahu and CCC should be established to consider the appointment of suitable peer reviewers and to have oversight of the peer reviews.	The Council will obtain a peer review of the irrigation scheme if this is the preferred option.

Option three:

Indicated option three, Summer only irrigation, with wetland or infiltration basin and discharge via a coastal infiltration gallery at other times as their first option – no submissions (0%)

Option four:

Indicated option four, subsurface flow wetland and discharge via a coastal infiltration gallery as their first option – 1 submission (1%)

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1.	28	Akaroa				1		2	I have been disappointed by the way the Christchurch City Council has undertaken the process regarding the wastewater disposal options. While we understand that the Council was directed to undertake consultation with Ngai Tahu as Kaitiaki of Akaroa		As part of this project Council as decision makers will need to consider the views and preferences of all those affected or likely to be affected by this decision. In order for the public to understand the views of Ngai Tahu it was important that this information was made publicly available in the booklet, so that submitters could also make an informed decision.

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									Harbour, it was not directed to publish their views and attach them as opinions on each of the options in what is meant to be an unbiased document. In doing so it appears that the Council is in support of these views and can be seen as directing public opinion to a particular option. Furthermore I understand that the Council made available to Ngai Tahu technical experts to further explain and directly answer questions arising. I am surprised and disappointed that the Council has not shown the same respect to landowners that would be directly affected by any of the land disposal options and made these experts available in a dedicated meeting. I am one of the landowners of Block F (Lot DP13887), and as such I would expect that my submission is given weight over non-affected submitters to the scheme options. My land at Block F is an integral part of a 106 hectare beef farming operation, and provides vital winter grazing to young and light stock. Only light animals can be grazed on these steep slopes during winter because the soil quickly becomes saturated after rain and is susceptible to plugging impaction. The land is too steep with inadequate road access to allow a cut and carry crop (hay). As a landowner who had an easement allowing the Council to take water from the Takamatua Stream; I have been unimpressed by the way that my land is treated by the Council during access and construction. I would therefore not want any additional involvement of the Council on my property to maintain plant. This along with the lack of detail included in the consultation document, and uncertainty contained in answers to specific questions to Council staff; I am unable to support the use of my land for options 1-3. If the Council was able to give evidence that option 4 (subsurface flow wetland) was workable and effective in the stated location and at the volumes required, this would be my most preferred option. The environmental offset of creating a habitat lacking on Banks Peninsula (and nationally) is a positive. However, I have reservations whether this option could adequately handle the quantities of wastewater produced, particularly in spring and autumn when the groundwater levels are still relatively high and the population contributing wastewater to the scheme is still high. Hence my support being conditional to Council to provide evidence. If this evidence was unable to be given my next preferred option would be option 6 (harbour outfall pipeline). I would have the expectation that the risk to public health and the environment is shown to be significantly less than the existing scheme. To do this I fell that the Council must further investigate the feasibility and practicalities of treating the wastewater to the standard where not only does it "look just like tapwater" but it is at the same quality.		In regard to your concerns about the weighting of submissions it is up to the decision makers as to how much weighting they place on each submission received. Subsequent preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.

Option five:

Indicated option five, infiltration basin and discharge via a coastal infiltration gallery as their first option – no submissions (0%)

Option six:

Indicated option six, previously proposed mid-harbour outfall as their first option – 35 submissions (43%)

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1.	8	Christchurch						1		Same system as Chch city which is acceptable to all citizens. Ngai Tahu included. If the water is deemed very clean then they shouldn't have overall say. The good of the community should be taken into account first and foremost over Ngai Tahu's opinion. It's obvious Takamatua residence will also find all the other options offensive too. More so because it's not even their treated water. All other options are complicated, involve monitoring, more upkeep, are on private land and could have the potential to affect residence. Takamatua options are offensive to those living there. The system could run down the peninsular towards Childrens Bay not Takamatua where 100s of people live. The very suggestion is outragous. I find it offensive that Ngai Tahu find the Peninsular options acceptable when they don't own this land and are speaking over those who do. If the water is so clean then the harbour outfall is obviously the safest option for ALL. Ngai Tahu can't expect to shift Akaroa's problem to their neighbours especally when Takamatua have septic tanks and are not even contributing to the system. I have a house at 2 Fantail Lane Takamatua. We get water run off from the farmland above which settles under our house. We would be below the irrigation area. We have spent alot of money trying to direct it into drains. The farmer dug out a small track or channels that now direct rainwater straight down to No 11 below. There is also one above 5 & 7.This overflow overwhelms the lanes drains in heavy rain and ends up on our property and others in the lane. I don't want the risk of any treated wastewater runoff passing onto our property. It may never happen. But it could. I have been told by a CCC engineer options 1 & 2 the irrigation would be turned off when it rains. Nowhere in any literature have I read that nor how this would be done and successfully for the next 100 years without the risk of failure sometime or other. Any failure could have health affects on the residence downhill. If the farmer reshaped the pasture above Fantail Lane to contain their own water runoff to neighbours the risk would substantially lowered.	The Council is committed to a partnership approach with Ngai Tahu. In addition, Ngai Tahu is a party to the appeal against the decline of the harbour outfall consents, and the Environment Court has directed the Council and Ngai Tahu to mediation. Subsequent preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. There would be no irrigation when it rains. This would be achieved by storing treated wastewater in a large pond. The pond has been sized to store flow during winter and using historical rainfall data to determine the periods when irrigation is not possible at other times of the year.
2.	63	Christchurch	2	3	4	5	6	1	I have numbered my choices to the left of the options as on the printed form. Correct me if I am wrong. At present the treated wastewater flows out to sea. My belief is that this is the best option especially now with advanced treatment system. Any other options put the land at risk with the soil structure we have it is likely to slip or create underrunners, which we already have some problems with at Takamatua. If the land options go ahead you would need a greater amount of land initially than worked out at present until the trees for instance are of a size to absorb enough water. Any irrigation or infiltration system could be costly to maintain.		We note your concerns about land instability on Takamatua Peninsula. Subsequent preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
3.	55	Christchurch	6	6	6	6	6	1	The original consent application for the Harbour Outfall must remain the only pragmatic solution for the disposal of waste water. Cleary this was the intent with the original Council application and time and resources must be re-committed to see harbour outfall option appealed at the Environment Court. It is misleading to have submitters rank the 6 options, as it creates a statistical bias of acceptance when clearly none of the options 1-5 have been properly investigated by Council staff, they freely admit there has	Using the Takamatua Peninsula and Valley as a default option for the dumping of Akaroa's township wastewater shows complete insensitivity to the beliefs and cultural values of the residents of Takamatua. This is particularly ironic when Takamatua does not have a reticulated sewerage system and residents have individual responsibility and liability for the treatment and disposal of their sewerage. It is also alarming that the supporting documentation provided by Council was woefully inadequate for the complex wastewater disposal options they were asking residents to consider. Very little geotechnical information as to soil suitability, soil	The original options assessment in 2010 only considered land for irrigation where there was a willing seller, of which there were only two sites. This limited consideration of land disposal, and the decision of the commissioners in 2015 stated insufficient consideration of options as one of the reasons for declining the harbour outfall consent. All property owners included in the pink areas within the consultation booklet were all spoken with before the public consultation commenced.

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									not been time since the Environment court decision. The entire consultation process has been deceptive, as Council have created a situation, which implies residents must choose an option.	structure, long-term affects on the soil i.e. nitrate build-up was provided. Very little consultation had taken place with the owners of land identified in the Council 'desktop' exercise. It was clear at the community consultation session, that local residents had a wealth of real life experience data that would be invaluable to planners. Even more alarming was planners admitted they hadn't physically walked over nominated sites, instead reverting to desktop analysis. To be fair, Council staff never contemplated that the Environment Court would reject the harbour outfall option for the discharge of wastewater, and the documentation provided reeks of a hurried attempt to provide 5 options, implying residents have to pick on. It is complete waste of resources to post this consultation process devote many millions of dollars to developing an option, go through a full consent and appeal process only to risk being declined again. I reiterate again, council need to commit the resource necessary to ensure the only sensible option goes ahead - the Harbour outfall option. This will prove to be the most time and resource efficient option for all parties.	The Council is mindful that it needs to balance the costs of detailed investigations of multiple options which may not be progressed against the desire of the community to have sufficient information to express a preferred option. We note your concerns about lack of geotechnical investigations and site walkovers, and have asked Beca and PDP to conduct geotechnical investigations and infiltration tests on land that is being considered for irrigation. These investigations have found that Takamatua Peninsula is not suitable for irrigation of treated wastewater and so the Council is no longer considering this location. Other land areas further afield than set out in the consultation booklet are being investigated, including site walkovers and infiltration tests. The results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
4.	60	Christchurch	6	6	6	6	6	1	The mid-harbour outfall, was also the Council's preferred option and it needs to be committed to ensuring this option is delivered. The other 5 were reactive 'desktop' ideas and these are unproven.	Commit to appealing the current decision in the Environment Court, to ensuring the Harbour outfall proceeds.	Your submission is noted.
5.	54	Takamatua	6	6	6	6	6	1	Under NO circumstances do I wish to see waste water sprayed onto land in Takamatua, as being predominantly a clay base with a surface structure of "loess" (top soil) it is not a suitable structure to absorb the wastewater		Your submission is noted.
6.	71	Takamatua	6	6	6	6	6	1	ONLY ONE VIABLE OPTION.	There is too much unknown and gaps in the planning/statements for any of the on-land waste water dispersal in terms of the unknown land that would be designated as the dispersal fields (more land that is required has been identified). For Options 1 - 5 the variable slopes, stability issues in terms of tunnel gully erosion due to the various dispersant nature of loess and the poor infiltration of Banks Peninsula soils when wet, especially in winter make these options very concerning. The (3-5) which involve both wetlands/infiltration basins and coastal infiltration all have major issues from probable increase in mosquito habitats to potential contamination of kia moana and recreational areas in Takamatua bay and surrounds. These constructed wetlands may impact on the established walking tracks around the Takamatua headland and the Childrens Bay to Takamatua walkway. While the coastal infiltration would be constructed in an area that is susceptible to the vagaries of wind and tides and is a recreational area used at low tide by Takamatua residents and visitors.	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.
7.	72	Takamatua	6	6	6	6	6	1	I believe the mid harbour outfall to be the best option of those proposed by the Council, however I don't agree with the location of the Proposed Mixing zone being placed off Green Point, (approx 2.5km from Childrens Bay) I believe no matter what the cost the Proposed mixing zone should be taken out past the Akaroa Heads . (It is never going to be cheaper!!) Under no circumstances do I wish to see	Having spent a lifetime in the Marine Offshore & Petroleum Industry as an Electrical Supervisor, and Maintenance Administrator, I cannot understand why the Council did not consider installing in the Waste Water Treatment Plant (in addition to the membrane filtration and Ultra Violet treatment,) an Electrolytic Sewage Treatment system (EST) as the powerful sterilents generated kill most living organisms which may be present in the sewage including AIDs virus, E coli, pathogens, other viruses such as polio, etc. In	The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has “generally heavy ground swell” and “Loose seabed, bad holding ground”. The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and

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									waste water sprayed onto pastures around Takamatua as the soil type is not conducive for this purpose.	the light of recent claims that such viruses can survive in sea water for several days, this is a very welcome characteristic of EST. The technology is well proven and a standard method of sewage treatment on ocean liners, cruise ships, oil rigs and drillships is achieved by electrolytic means and has been for many years. It has also been used in Norway and the Channel Islands Under International Maritime Organisation (IMO) guidelines the Electrolytic Sewage Treatment meets the IMO and MARPOL (International Convention for the Prevention of Pollution from Ships standards for safe discharge to sea. These systems have also been used in Portsmouth, the Channel Islands and in Norway. Having installed several of these systems in the marine offshore industry I have personal knowledge of their performance.	complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. There are a number of different package systems available for treatment of wastewater in the confines of ships and oil rigs. The Omni Pure system uses high levels of electricity with sea water to produce chlorine from the seawater to disinfect the waste streams before discharge into the sea. The level of treatment achieved in these systems would not be sufficient for a harbour discharge. Council has opted for standard proven treatment plant technology that is normally used in New Zealand communities to produce high quality treated wastewater.
8.	73	Takamatua	6	6	6	6	6	1	ONLY ONE OPTION IS SUFFICE I.E. OUTFALL TO SEA. DO NOT DISCHARGE ONTO LAND.	The wastewater needs to be pumped out to sea OUTSIDE the Akaroa Head.	The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has “generally heavy ground swell” and “Loose seabed, bad holding ground”. The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further.
9.	58	Takamatua						1	For Option 6, the CCC research says: "the wastewater would be diluted at least 78-fold before it reaches the surface, and further dilution is achieved as the plume spreads out, so that it becomes virtually undetectable." The costs are up-front...with no ongoing annual costs. However, year-round wastewater land application on the Banks Peninsula, including Takamatua sites, is one of the most challenging and difficult areas to get it right. The land comprises variable slopes, geotechnical stability risks, poorly draining silty clay and loess soils (some with dispersive qualities), with soil profile anomalies such as fragipans). A common problem with wastewater application to Banks Peninsula soils is the low to zero infiltration capabilities once they become wet, particularly in the winter. These challenges will require careful consideration in the design of a wastewater land application system.		Your submission is noted.
10.	30	Christchurch		2				1	No land owners is disadvantageous		Your submission is noted.
11.	21	Akaroa	2	6	3	4	5	1	Option 6 would not worry anybody in our community. Option 1 year round irrigation to trees Option 3 Summer only irrigation of pasture. This could be combined with winter trickle irrigation of trees especially if the higher blocks B, E and H were used for trees.	My main concern is that if water is sprayed on to the higher part of Block F during winter and it rains quite a bit, the runoff will come down through the nineteen house settlement on Kotlowski Rd. These sections are small and all have septic tanks of one sort or another. It is difficult enough getting rid of our own effluent when the ground is sodden in winter. Surface water flows through these sections as it is when it rains heavily.	We note your concerns about runoff onto other properties. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.

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12.	51	Kaiapoi						1	With the water being treated better, number 6 is the only option	Option 1, 2, 3 is ridiculous on any slopes above existing properties on clay base of grounds. Land is prone to slipping when wet and has a network of gully erosion	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
13.	9	Sydney	6	4	3	2	5	1	Option 6 - Rank 1 - Harbour discharge has been working well for many decades. The option proposed is an improvement on an already proven system. It has the least impact on existing landforms or land owners. I note Ngai Tahu's cultural reservations, however Ngai Tahu are happy to discharge waste from their other commercial activities (Dairy Farms etc) so I they are not consistent in applying a cultural standard. Outfall option will likely have the least NET greenhouse gas emissions during construction phase. Also this option is future proofed against rising sea levels. Option 4 - Rank 2 - Waste Water is not present on the ground, lower cost. However, with sea levels rising, will the system be drowned? Option 3 - Rank 3 - Reduced time waste waste water is sprayed. I have real concerns about Aerosol Drift, with public safety unable to be completely guaranteed. Option 2 - Rank 4 - Concerns about Aerosol Drift to my property, location of storage pond near my property. Option 5 - Rank 5 - Surface ponding not good for any waste water system as it encourages smell & insects. Also with sea levels rising, will the system be drowned? Massive amount of pipe laying and maintenance will be required. You are going to dig up half the peninsula when a perfectly good harbour outfall pipe already exists. Option 6 - Rank 6 - Year round discharge and smell adjacent to my property. Long grow time for trees with little economic value. Increases bush fire hazards around the peninsula. We own a block of land on Kotare Lane, on which we plan to build our family home. Our section is directly adjacent to the planned discharge zones. Most options will have waste water discharged adjacent to our property, and / or a storage pond nearby. We view this as having significant impacts on our property value and proposed lifestyle. Should the council be forced to use one of the Options other than 6, we would like to offer our section to the council to purchase for site access at fair market value. We would rather give up our dream location than live next to a sewage treatment site.		None of the options will be impacted by sea level rise. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. The distance travelled by wastewater spray droplets is influenced by droplet size, topography and wind conditions. The low pressure K-line irrigators proposed for the spray irrigation option emit relatively large droplets of water that will tend to settle onto the land surface reasonably close to the spray nozzles. The provision of shelter belts around the boundary of spray irrigation areas will also reduce the risk of spray drift by reducing wind velocities and filtering droplets from air passing through them. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. Option 6 is for a new harbour outfall. None of the options propose retaining the use of the existing harbour outfall. We note your concerns about trees creating a fire hazard and if this option was chosen, this would be taken into account in the selection of tree species and the design of the irrigation scheme. Subsequent land investigations have found that Takamatua Peninsula is not suitable for irrigation of treated wastewater and so the Council is no longer considering this location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
14.	31	Rakaia	5	6	4	2	3	1	State of Art water cleaning fine for harbour. I have issues with on-land, especially in wet times given that we are told that with global warming - rain less often but bigger events		No allowance has been made for climate change. On the east coast of the South Island the impact of climate change is generally expected to be drier summer conditions with heavier storm events (more intense rainfall over the same duration). This may result in greater localised flooding during the event, but is unlikely to cause any greater infiltration into the wastewater network than already allowed for. In addition, as the Council continues work on reducing

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											infiltration and inflow into the network, any small increases that may be attributed to climate change would likely be offset by decreases in flow from improvements to the network. The net result is that climate change is not expected to affect design flows significantly.
15.	56	Takamatua			4	3	2	1	In my view the Water has been treated so that it is almost drinkable. It should be run thru the L'Aube hill water treatment plant and re-consumed, however I understand that hormones and some viruses are still not able to be removed as science does not allow this yet--but maybe soon?? Of course it is very clean. Since man came to Akaroa waste has gone to the harbour and the present scheme puts less than clean water to the harbour. I do not believe that people who identify as Maori can still object to the new treated water going to harbour. Science has caught up and overtaken the concept that they now claim as Mauri and the objection they raise is not justifiable or sustainable in the modern environment. The property I own is at the top of Kotlowski road and immediately below proposed block F. This land will not be sold by the Frasers who own it and it is almost all over 15 degrees. I object to the water going to this land as it will be unable to take the flow without becoming too wet, This land also takes road water and water from the land above the road (Long Bay Road) and that discharge has already caused slips to occur. I am certain the Council's soil tests will confirm my view. The distance of 25 meters is too close to the back of my house and garden and a bund to prevent flow to my property will be essential. In respect of the other blocks I comment that both block I and J are totally out of the question as block I (Church block) is just too low lying while block J (Oborn) is part of a wonderful farm/garden and is also low lying. The upper part of J (Mark/Denise) is over 15 Degrees and has a new house which is not connected to the Akaroa water scheme and is dependent on roof and stream water for domestic use and id also being extensively planted/restored .All options to put water waste to Takamatua valley are not well thought out and will change the whole character of the valley and destroy its values and views, Already the Kotlowski road houses discharge waste by septic tank and in my view is too closely settled for this type of discharge -11 houses over a small area of land all with septic tanks The flat land (blocks I and J) are used for Hay/grazing and winter feed growth and have many wonderful trees and the open space that the land provides as the valley floor is an essential character of the charm of the whole valley.	The whole concept is morally wrong. Firstly the Council have taken Takamatua's water supply for Akaroa and now they want to give it back with a few additives!! Takamatua is not part of the Akaroa sewerage system and it is morally bankrupt and inept to think that Akaroa's sewage can be dumped on the residents of Takamatua who are NOT part of any sewerage scheme and who do not want /need to be part of such a scheme. This is a fundamental flaw in the whole concept. If the council wants to discharge to land they must find other land away from settlements and which does not destroy the natural and aesthetic values of an area. The council could have purchased the old Akaroa golf course land for example at the top of Bells road where 100 acres was on the market for over two years and contains flat to gently sloping land away from views /Houses and would have been ideal for the scheme. This land was sold 8 months ago to John Thacker. If the council does not go the sea then it must find other land away from settlement/houses and of a scale that does not ruin the area chosen.	Reuse of the treated wastewater for drinking water (potable reuse) was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It was discounted due to it being culturally unacceptable to Ngai Tahu and likely being culturally unacceptable to the wider community. Reuse of wastewater as drinking water does not eliminate the need for land irrigation altogether because the reverse osmosis membrane can only process about 70% of the wastewater. The remaining 30% of the flow is discharged as a waste stream, containing all of the nutrients, dissolved solids and other contaminants that were present in the wastewater treatment plant discharge flow. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
16.	61	Ashburton					3	1	Option 6 – we support option 6 as our first choice. This clearly was the Council's first choice also, hence the application it made for the original consents sought. We are not aware of any absence of, or restraint in, food gathering from Akaroa Harbour on the part to Ngai Tahu, so they should be even more content with the greater level of treatment proposed with option 6. Option 5 – Our second preference would be option 5, with storage option A, except that any coastal gallery should be sited around the south-western corner of the Takamatua		The original options assessment in 2010 only considered land for irrigation where there was a willing seller, of which there were only two sites. This limited consideration of land disposal, and the decision of the commissioners in 2015 stated insufficient consideration of options as one of the reasons for declining the harbour outfall consent. The discharge of treated human wastewater to the harbour is offensive to the Ngāi Tahu parties, and this was the other reason the Commissioners gave for declining the consents for the harbour outfall.

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									headland. The beach area on the northern side of Lushingtons Bay is frequently used by beach walkers, mussel gatherers, and fishers. Disposing of treated wastewater at the water's edge, right there in front of such persons, would be culturally offensive to pakehas too. On the other hand, the south-western coast of the headland is inaccessible and not used for such activities, is far away from any residential areas, and would also be nearer to the treatment site (as also storage option A would be). New option 7 – Most Peninsula surface water that doesn't evaporate eventually ends up on the harbour. Soil-filtered water should be pretty clean by the time it reaches the harbour. The three stage level of treatment now proposed should provide a vast improvement in the quality of the wastewater disposed of through the Harbour outfall. An infiltration basin (storage option A) could be incorporated within option 6 to provide a fourth level of treatment to the wastewater, before being delivered to the centre of the Harbour. (This could be the unstated option 7 – option 6 combined with parts of option 5.). Land-based options – The other land based options would not be acceptable, unless all discharge and disposal areas are situated on the southern side of the Takamatua headland. That the options for consideration do not include possible sites on this southern side is remarkable. A photograph is attached. This area is easily within the required 2 km radius, contains large, flattish or gently-sloping areas, and is far away from any residential areas. Also, being a scenic rural headland very visible from Akaroa township it is unlikely to become residential (or does the Council somehow think or intend otherwise?). At the Akaroa meeting my inquiry on this point was fobbed off by saying the southern side of headland was a slip-prone area (really? – more so than anywhere else being suggested?). In any event, the choices of other suggested areas (which the owners or neighbours of such sites present at the meeting described as "slip-prone" also) were excused by the presenters as having been the result of a desktop exercise only. The suggested choices had not been based on site inspections, but had just been chosen from the contour maps according to the availability of slopes no greater than 15%. Therefore, "slip-proneness" was said not to have been part of the site selection process anyway. How, therefore, could the southern side of the headland have been so starkly omitted from the range of suggested possible sites? General – It is noted that some of the other options would still depend upon emergency discharge to the Harbour. Also the total discharges from valley streams into the Harbour of land run-off containing sediment, animal effluent, fertiliser, pesticides, etc, are said to have a far greater degrading effect on the Harbour water quality than the wastewater system. All of this makes our option 7 above quite acceptable. Option 6 again – perhaps modified. Option 6, as it stands, is the best option to deal with the following:		The south side of Takamatua was discounted due to the instability of the land. The area on the southern side of the headland shown in your photo was considered in the 2010 options study, but is less than 10% of the area required for treated wastewater irrigation. The proposed treatment plant includes membrane filtration and will provide a much higher degree of filtration than could be provided by an infiltration basin. Therefore, adding an infiltration basin to the treatment process upstream of a harbour outfall would provide only limited additional treatment for a significant additional cost, which would be in excess of the project budget. The Ngai Tahu parties have advised that an infiltration basin does not meet their cultural values.

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									· Operational breakdowns · Staff errors · Periods of excess rain (remembering that the discharge/disposal areas will already be saturated with wastewater, aggravating the effect of heavy rain) · Periods of excess wastewater · Inevitable emergencies · Future expansion (including the addition to the sewage scheme of the several Takamatua settlements). We see option 6, supplemented with a further level of treatment through an infiltration basin (option 7), as providing a sensible and long term solution which should be acceptable to all, including Ngai Tahu.		
17.	43	Christchurch						1			Your submission is noted.
18.	42	Waiau						1	Option 6 This is the only viable option for Akaroa's waste water. If water is so well 'cleaned' it can be discharged into harbour. If this is not acceptable to Ngai Tahu a considerable extension of pipe must be considered. The harbour with extended pipe will be the cheapest in the long run as the system must last for 50+ years. With the above there will be no fire risk, no water logging of soil and sub soil, no increased risk of slips and subsidence, no loss of property values, no risk from viruses and chemicals which cannot be removed. Option 1 This should be over the whole of Takamatua peninsula not just the side dwellings. The fire risk will be a problem a Kanuka/Manuka will burn even when lush and green and will topple easily in high winds due to saturated soil beneath. It's concerning that the winter storage will be applied along with the summer waste therefore making the land continuously saturated – surely there will be a limit on application rates. Will the system cope with future subdivisions e.g. Childrens Bay and surrounding areas? Option 2 Same applies as option 1 as the area suggested is too small to absorb this. The run off in wet times will flow back into the harbour. The nitrate build up over years of this option will also leach into creeks and streams and the harbour. Up to six months of the year in wet seasons irrigation will be impossible therefore overloading the summer application. Thin soil over clay base will be water logged and won't dry out quickly, slips will occur. Odour and drift will be a problem with spray irrigation, 25 meters from dwellings is far too close. Long dry grass will create a huge fire risk. Options 3, 4 and 5		The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. We note your concerns about trees or grass creating a fire hazard and if irrigation to land is the selected option, this would be taken into account in the selection of tree species and the design of the irrigation scheme. The south side of Takamatua was discounted due to the instability of the land in the 2010 options study. For the irrigation options, treated wastewater would be applied to land at rates that meets the assimilative capacity of site vegetation and soils. Generally, sustainable land application systems are operated on a soil moisture deficit basis to ensure that no ponding or runoff to surface waters occurs. Having an appropriately sized storage pond would be essential when soil conditions are unsuitable for irrigation. Therefore, run-off is not expected other than the run-off that already occurs when it rains. Historical rainfall data has been used to size the storage pond and irrigation area, to make sure that there is sufficient storage so that irrigation rates are no more than the assimilative capacity of the soil. The treatment plant has been designed taking into account population forecasts for permanent residents and visitors. This includes provision for Takamatua to connect to the wastewater system in future. The treatment plant is designed to reduce nitrogen (including nitrate) and the irrigation area has been sized to avoid issues with nitrate leaching. The wastewater will be very well treated and will not have an offensive or objectionable odour. The wastewater from the bypass treatment is slightly less well treated, so may be more odorous. However, this will be mixed with fully treated wastewater in the storage pond, so the combined wastewater is unlikely to be odorous. If a land based option is chosen, this will be assessed in more detail at the next

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									These are 'red herrings' totally unacceptable to everyone concerned and just there so everyone will accept land irrigation. Why ruin such a beautiful pristine environment where numerous people enjoy so many water activities and fishing as well.		stage of the project. One option to reduce the risk of odour would be to cover the storage pond and provide odour treatment for any air from the pond. The distance travelled by wastewater spray droplets is influenced by droplet size, topography and wind conditions. The low pressure K-line irrigators proposed for the spray irrigation option emit relatively large droplets of water that will tend to settle onto the land surface reasonably close to the spray nozzles. The provision of shelter belts around the boundary of spray irrigation areas will also reduce the risk of spray drift by reducing wind velocities and filtering droplets from air passing through them. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.
19.	2	Christchurch	6	6	6	6	6	1	Harbour outfall presents minimal risk. All other options are open to risk factors such as health, smell, breeding undesirable insects and possible problems coping with discharge volumes	Having been brought up as a child a kilometre from the Aranui plant a sealed disposal option reducing the above issues is in my opinion required.	The wastewater will be very well treated (to a much higher quality than from the Christchurch wastewater treatment plant) and will not have an offensive or objectionable odour. The wastewater from the bypass treatment is slightly less well treated, so may be more odorous. However, this will be mixed with fully treated wastewater in the storage pond, so the combined wastewater is unlikely to be odorous. If a land based option is chosen, this will be assessed in more detail at the next stage of the project. One option to reduce the risk of odour would be to cover the storage pond and provide odour treatment for any air from the pond. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options.
20.	3	Christchurch	6	5	4	3	2	1	We are Owners of (Block F Bottom half of this area) 1. This land gets wet in winter so would not like to see more water put on it. 2. We do not own a lot of land and for you to use this part of our land would not help us feed our animals (sheep) all year round. 3. This is Open Pasture so would not like to see trees, Plants put on it. 4. If the Maories want water to go on land first then use their land ie at Onuku which is all in gorse and not useful for anything. Why waste good (pasture) land to suit the Maori. Something wrong here. Law for one not the other. 5 NO to using our land.		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. It is possible to graze stock on land irrigated with treated wastewater. Lincoln University has been trialling irrigating soil cores taken from Duvauchelle and Takamatua and the results show that irrigation with treated wastewater significantly increases grass growth. The land around the Ōnuku Marae is predominantly covered in bush but is too steep to be appropriate for irrigation of wastewater.
21.	16	Christchurch	6	6	6	6	6	1	We oppose any land-based options in or near Takamatua because of land stability issues. We support continued discharge into the harbour.	We own the property at 52 Takamatua Valley Road.	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the

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											consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
22.	75	Takamatua	6	6	6	6	6	1	Our submission is to totally disagree with options 1, 2, 3, 4 and 5 in the proposal. Option 6 is the best option in our opinion. It will cause the least damage to the environment. Our property is at 36 Kotare Lane, Takamatua, the land around us and other properties are prone to slips in the wet weather. We have had our property for 29 years and have seen the effects of erosion caused by surface run off, and we feel an irrigation scheme will only make matters worse. We are mystified as to why the residents of Takamatua are impacted with the by-product of a wastewater treatment plant that services the people of Akaroa, while we are required to maintain our own septic tank sewage systems. The sewage being treated and discharged in to our environment isn't of our making.		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.
23.	49	Rangiora						1	After much consideration we feel we cannot support any of the other options. The Ngai Tahu parties appear to have had a huge input into the consideration of these options. Perhaps they would be willing to help fund a system to send wastewater further out in the harbour.	1. Takamatua has no wastewater system. It seems inconceivable that the City Council would consider sending Akaroa's wastewater to Takamatua. Perhaps - there are plans for Takamatua? 2. Storage ponds are very close to a residential area. We would worry about mosquitos and other insects around these ponds and other wet areas. 3. Risk of erosion. If the land is already wet with the wastewater - there could be a risk of erosion after heavy rainfalls. 4. Infiltration gallerys appear to be very close to recreation areas - you do mention that there is a slightly higher risk to public health.	The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has “generally heavy ground swell” and “Loose seabed, bad holding ground”. The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. P Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council’s rating policy. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the

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											consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.
24.	48	Akaroa						1	Because of our properties very close proximity to the proposed out fall options 1 to 5 will have a severe detrimental impact on us and our property values.	Options 1 to 5 could cause serious implications for our land use, soil stability, spring water supply for domestic and stock use, increased traffic hazards on to main highway. Noise, air and ground pollution and in particular major loss of property value.	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. Historically human wastewater has been treated to a level where diseases can potentially be irrigated onto pasture. If cattle graze the irrigated pasture too soon after the irrigation then there is the potential to transfer the diseases from humans to cattle. The main concern was around the beef tape worm (Taenia saginata). The withholding period for when stock could not enter a paddock irrigated with human wastewater was typically around 30 days. At Akaroa the proposal is to use an advanced treatment system which will prevent most diseases (and in particular the cysts of the beef tapeworm) from being present in the treated wastewater to be irrigated. This presents the opportunity to consider reducing the withholding time between irrigation and grazing. The use of the land by any type of stock and any withholding requirements will be considered further as options are considered in more detail. The pump station would be designed to meet the noise requirements of the District Plan, which sets noise limits to be met at the property boundary. The sprinklers would not be noisy and would be in keeping with the rural environment. Other than the water supply bores shown on the maps, there are no consented water takes in any of the areas. There may be domestic or stock drinking water takes that do not require consent; these would be taken into consideration if the Council wished to use a specific property for irrigation.
25.	59	Christchurch	2	6	6	6	6	1	There is too much unknown and gaps in the planning/statements for any of the on-land waste water dispersal in terms of the unknown land that would be designated as the dispersal fields (more land that is required has been identified). For Options 1 - 5 the variable slopes, stability issues in terms of tunnel gully erosion due to the various dispersant nature of loess and the poor infiltration of Banks Peninsula soils when wet, especially in winter make these options very concerning. The (3-5) which involve both wetlands/infiltration basins and coastal infiltration all have major issues from probable increase in	The concern over the CCC service departments responding to any mechanical issues rapidly is high as witnessed by the recent water mains leaking in the main street of Akaroa for several days unattended. With prospect of Akaroa's waste water being located on the northern (Takamatua side) ridge between Akaroa and Takamatua means that any mechanical issues that are not attended to will greatly impact the Takamatua residents.	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.

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									mosquito habitats to potential contamination of kai moana and recreational areas in Takamatua bay and surrounds. These constructed wetlands may impact on the established walking tracks around the Takamatua headland and the Childrens Bay to Takamatua walkway. While the coastal infiltration would be constructed in an area that is susceptible to the vagaries of wind and tides and is a recreational area used at low tide by Takamatua residents and visitors.		Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme.
26.	27	Christchurch	2					1	The mid-harbour outfall is our preferred option. This seems the most practicable solution, despite its increased initial cost, as it does not require additional land purchase, there is no negative impact on residential land owners and the public health risks are very low. Option 2 considered to be the only supported option of the other 5. Rated lower due to concerns regarding volume of land acquisition/lease required, time to grow suitable trees and risks associated with overflow to residential areas. Supported as does not discharge any wastewater to the harbour, provides bush regeneration and therefore environmentally enhances the area.	Strongly oppose all options which require an infiltration gallery due to the increased public health risks associated with higher concentrations of potentially harmful bacteria close to the coastline and therefore in closer proximity to recreational users and shellfish etc.	Your submission is noted.
27.	17	Akaroa	2	3	4	5	6	1	As a resident in Takamatua, I object to the idea that shell fish may be compromised by using the Takamatua point for treated sewage therefore I am concerned about options 4, 5, & 6 I only support option 6 if it can be discharged further out say as far as Dan Rogers Reserve I am concerned at the size of pond needed for options 2, 3, & 4. Flooding has been recorded annually from 2008 - 2015 including the Easter flooding of 2014.	Block J is totally unsuitable for any sort of irrigation. The area is too small given that it still includes our woolshed, sheep yards. This area is extensively planted with spring bulbs which need no extra summer irrigation and has a listed tree. The area adjoining the Wren property is either within 25 metres of the creek or the boundary or over the 15 degree angle. The only other flat land on the Kingston property is a narrow strip bounded by the creek and the road strip also contains a listed Totara. I would request that the proposed treatment area of Block J be removed as soon as possible. I have grave reservations about the storage option A given the likelihood of global warming and continuing periods of very high rainfall not necessary during the winter. Two of the most damaging floods recently have been in January and at Easter 2014. I would also point out the difficulty of obtaining hay making contractors on the Peninsula and that the K line irrigation would have to be moved before hay could be cut, raked or baled. There has been talk of the Wainui scheme but I would point out of the 35 houses, less than a third have full time occupancy and the water goes on to an established forest. I believe that the houses are only fully occupied over major holiday periods.	The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has “generally heavy ground swell” and “Loose seabed, bad holding ground”. The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. No allowance has been made for climate change. On the east coast of the South Island the impact of climate change is generally expected to be drier summer conditions with heavier storm events (more intense rainfall over the same duration). This may result in greater localised flooding during the event, but is unlikely to cause any greater infiltration into the wastewater network than already allowed for. In addition, as the Council continues work on reducing infiltration and inflow into the network, any small increases that may be attributed to climate change would likely be offset by decreases in flow from improvements to the network. The net result is that climate change is not expected to affect design flows significantly. We agree that the treated wastewater irrigation scheme at Wainui is different in nature and scale to that being considered for Akaroa, which is why land investigations of possibly suitable land near Akaroa have been undertaken.

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											We note your comments about the significant trees on your property. This would need to be taken into account if the Council chooses to pursue irrigation to land in Takamatua Valley, as would the risk of flooding.
28.	39	Christchurch						1	I am firmly against all of Options 1-5. Option 6 is the only safe and sensible option for a sustainable future but the money would need to be found to pump it out to the Heads	I grew up in Takamatua and went to Akaroa Primary School, I have owned land and visited Takamatua all through my adult life. I'm about to return as a permanent resident, currently building my retirement home on my land in Kingfisher Point. I am dismayed and devastated to be confronted with this unfortunate issue of the wastewater. I have attended the meetings and read everything on the website, to try to be informed and gain an understanding of the issues involved. To be honest a great deal of it is a bit over my head, so I am not going to speak of the technical, geotechnical or scientific obstacles, I will leave that to the many experts among us. I would rather speak about how it feels to be confronted with the possibility of having Akaroa's treated wastewater dispersed right above the new development of Kingfisher Point, or on any other part of the Takamatua Peninsula or the Valley. I respect and understand the cultural issues around eating shellfish and seafood from our harbour with wastewater disposal flowing into it, and indeed I share the same concerns. It is far from ideal. I understand that from a Ngai Tahu perspective, once it has passed through land this mitigates the cultural issue, or softens the blow. However, it doesn't soften it for me if the outlet is then based on the point of our bay at Takamatua. In fact, under the proposed scheme, at many times of heavy rainfall and high usage, the wastewater would be going directly (after treatment) to this proposed outflow on the Lushingtons Bay Point, straight into our harbour, which contradicts the original objection. It seems to me that this is simply shifting an unsavoury problem to a new location, being where the treated wastewater could flow directly from the treatment plan through stone or rock, at least partially mitigating the cultural issue, and then be pumped directly out to the Heads from Childrens Bay. It will be expensive, yes, but a necessary evil and far better than ruining our land. I do not see it as reasonable or fair solution to even consider using any part of Takamatua as a dumping ground for the sewer waste of Akaroa. We do not even have reticulation ourselves, and are currently required to spend in excess of $15,000 for our natural systems which are working but sometimes struggling, and that is with most of the homeowners being part time occupants at best. The very thought of having chemically treated "irrigation" or mosquito breeding "holding ponds" of wastewater, carrying traces of viruses and other contaminants, right in our back yard, apparently as close as 25 metres from our homes, is so abhorrent, so shocking, that I simply cannot believe that this could be or will be the outcome of this research. It is almost unthinkable that options 1 – 5 could ever become a reality, and I am afraid. I was unaware of the wastewater issue until I received the Council's Wastewater Disposal Options booklet in the mail several weeks ago. I am dismayed to learn that Kevin Simcock has been on the Akaroa Wastewater Working Party since 2008, yet to the best of my limited knowledge this is the first that I, and a number of other residents of Takamatua, have heard about it. I am curious about this and I do not feel that an open, democratic and transparent process has been followed. It seems some secrecy has been afoot. I apologise if I am incorrect. I am sure if we'd all known these options were to be seriously considered we would have had a lot more to say, and a lot more time in which to say it.	The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. Members of the project team met with the Takamatua Residents Association prior to the formal consultation commencing and the booklets being distributed. Work on the Akaroa wastewater project has been on-going for a substantial number of years. Council staff were only aware that they would need to consult further on alternative options after the resource consent decision when the commissioners only approved the consents for the treatment plant and declined the consents for the mid-harbour outfall portion of the project.

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										I understand that a solution must be reached. I do not think the solution is to downgrade the feelings, perceptions, living quality and wellbeing of our community, or to downgrade the value of our land, nor to curb the historical joy our locals and our holiday makers have been experiencing for generations with their boating, water-skiing, fishing, farming, whitebaiting, diving and swimming activities in Takamatua. I believe there is only one sensible solution to the Akaroa Wastewater issue. That is to find the money and pipe it as far out towards the Heads that it can possibly go. I believe that it is better to wait, raise the finances, and produce an outcome that provides a long term sustainable future for all of Akaroa and Takamatua. All other alternatives seem offensive, dangerous and so very harmful to the land, the environment, the inner harbour, and to the way we feel about our beautiful Takamatua.	
29.	50	Christchurch						1	Only Option 6 is acceptable to us	We strongly oppose options 1-5 My family have owned land on the Takamatua headland since 1952. My father farmed the land and subdivided parts of the North facing lower spurs and Lushingtons Bay for holiday homes. During this period, I spent a lot of time helping with work on the farm and have good knowledge of this land and the problems associated with it. Most of the farm was sold in 1980. The area of Kingfisher Point was retained by the family and was developed more recently. We are currently building a bach at 8 Lushingtons Bay Road. I have experience in agriculture, land development and contracting in this area and elsewhere. We currently have a small block on the Port Hills. This block shares similar topography to the Takamatua land i.e. · North to North Westerly aspect · A mix of moderate slopes above steeper slopes · A large actively regressing gulley system · Deep loess-colluvium clays with active tunnel gulley systems. The Takamatua headland area proposed for irrigation has eight actively regressing gulley systems. These are immediately below or entering into the designated irrigation areas. Numerous case studies have been carried out on these erosion prone, poorly structured, loess and loess-colluvium soils. The Bell and Trangmar 1987 study examines the association between soil type and land instability in fine grained loessial and volcanic soils on the Port Hills and Banks Peninsula. This study is often referred to in reports and is referred to in information associated with the Akaroa Treated Wastewater Disposal Options including the full Tonkin & Taylor geotechnical report and the PDP hydrogeological report. Much of the information contained in the Bell and Trangmar report directly backs up my experiences and observations with this land over my lifetime. Some points include: · Tunnel gullies are most prevalent on the North-North West exposed headlands (dry aspects). · Constant exposure to seasonal wetting and drying · Tunnel gullies occur on slops 3-35 degrees	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation. Historically human wastewater has been treated to a level where diseases can potentially be irrigated onto pasture. If cattle graze the irrigated pasture too soon after the irrigation then there is the potential to transfer the diseases from humans to cattle. The main concern was around the beef tape worm (Taenia saginata). The withholding period for when stock could not enter a paddock irrigated with human wastewater was typically around 30 days. At Akaroa the proposal is to use an advanced treatment system which will prevent most diseases (and in particular the cysts of the beef tapeworm) from being present in the treated wastewater to be irrigated. This presents the opportunity to consider reducing the withholding time between irrigation and grazing. The use of the land by any type of stock and any withholding requirements will be considered further as options are considered in more detail. Other than the water supply bores shown on the maps, there are no consented water takes in any of the areas. There may be domestic or stock drinking water takes that do not require consent; these would be taken into consideration if the Council wished to use a specific property for irrigation. The wastewater will be very well treated and will not have an offensive or objectionable odour. The wastewater from the bypass treatment is slightly less well treated, so may be more odorous. However, this will be mixed with fully

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										· Cracking in summer due to shrinkage and low inter-granual cohesion · Rapid slaking and dispersion when wetted · Susceptibility to scouring by flowing water. In other words the soil cracks in summer, when it rains water goes into the cracks where it quickly starts dissolving the loess, forming small underground tunnels running downhill above the hard clap pan. These small invisible tunnels increase in size over time and eventually fail (i.e. the ground collapses into them). This sometimes leads to water build up and slips. Other times the water finds a new path under the clay pan leading to new bigger and deeper tunnels which can lead to major slope failures. These tunnels exist both under the proposed irrigation sites, and under the steeper slopes between the proposed sites and all of the houses below. Any irrigation either by K line (spray to pasture or crop) or dripper lines to trees will put all of our houses and the residents within, at an increased risk of a massive slope failure. According to Bell and Trangmar 1987 – the most common triggering mechanisms for large slope failures are a function of intensity, magnitude and duration of rainstorms and the antecedent moisture conditions within the regolith. (antecedent – meaning proceeding thing or circumstance). E.g. A week's drizzle, a broken pipe or a month's controlled irrigation, followed by a heavy rain event could cause a massive slip onto our houses. My point of quoting Bell and Trangmar here is that the heavy rain event alone probably wouldn't cause a large slope failure but a combination of any of the above and the heavy rain event is much more likely to. In my opinion this increased risk is a good enough reason not to consider irrigation to the land above and around our homes. This increased risk is acknowledged in the Beca report on page IV option 2 under risks and opportunities and in the ECan review on page 2 Rules 5.170 and 5.171 – Takamatua Peninsula is identified as a high soil erosion risk area. Other factors that make irrigation of wastewater to this land a dangerous and foolish option are as follows: · The beautiful diversity of our region will be put at risk from spray drift and/or root infiltration from the wide array of contaminants that aren't picked up by the membrane filter and the chemical treatment. Even if in only micro amounts these could have a cumulative effect on the health of ourselves, our children and future generations. This can't be denied and must be considered. · Contamination of potable water sources, there are many springs on the hills and in the valley which produce high quality drinking water. · Contamination of all fruit and vegetables, nuts, grapes and honey. · Contamination of livestock from grazing or eating contaminated fodder crops and hay. · Farmers need to be wary. There is an increasing trend in this country and worldwide to trace food from farm to plate. Consumers increasingly want to know where their food comes from or where the animals have been grazing and what they have been eating.	treated wastewater in the storage pond, so the combined wastewater is unlikely to be odorous. If a land based option is chosen, this will be assessed in more detail at the next stage of the project. One option to reduce the risk of odour would be to cover the storage pond and provide odour treatment for any air from the pond. The distance travelled by wastewater spray droplets is influenced by droplet size, topography and wind conditions. The low pressure K-line irrigators proposed for the spray irrigation option emit relatively large droplets of water that will tend to settle onto the land surface reasonably close to the spray nozzles. The provision of shelter belts around the boundary of spray irrigation areas will also reduce the risk of spray drift by reducing wind velocities and filtering droplets from air passing through them. No allowance has been made for climate change. On the east coast of the South Island the impact of climate change is generally expected to be drier summer conditions with heavier storm events (more intense rainfall over the same duration). This may result in greater localised flooding during the event, but is unlikely to cause any greater infiltration into the wastewater network than already allowed for. In addition, as the Council continues work on reducing infiltration and inflow into the network, any small increases that may be attributed to climate change would likely be offset by decreases in flow from improvements to the network. The net result is that climate change is not expected to affect design flows significantly. The final location of the storage pond has not yet been decided. It would be appropriately designed to the necessary standards to reduce the risk of failure to an acceptable level. If the Council decides to pursue the harbour outfall, consultation will be held with Ngai Tahu about further treatment that could make this less culturally offensive. Thank you for your suggestion. The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. If year-round irrigation to land is the selected option, a harbour outfall will not be required.

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										· Organics is another consideration. · Rainfall after irrigation combined with surface scouring and leeching will wash contaminants from the higher irrigated land onto steeper slopes below where it will quickly enter the gulley systems and pollute the foreshore and the Takamatua Creek. · The prospect of a 12,000m³ (12 million litre) pond full of wastewater immediately above our homes is a huge risk. · Earthquakes are an all too real threat these days. A strike slip quake with high vertical acceleration similar to the very damaging one which occurred 22 February 2011 could throw the contents of the pond towards the homes located immediately below. · Mosquitos and odour are also concerns. · Climate change is increasing the frequency of severe weather events. Options 3, 4 and 5 All involve the pond or ponds in Block A as well as the coastal infiltration gallery. This discharge onto the foreshore so close to our homes and beaches is an absurd idea. It is highly offensive to most people and is culturally offensive to Ngai Tahu. It also has a higher risk than a deep harbour outflow. We have been advised by CCC staff that this coastal infiltration gallery is no longer an option. Summary Takamatua Peninsula has been correctly identified as a high soil erosion risk area. There is plenty of highly respected scientific research evidence supporting this. My own observations over fifty years and as recently as last week confirm that it is indeed at risk of erosion. Any irrigation of wastewater to land in Takamatua poses an unacceptable risk to the lives and property of the residents living on the steep slopes below the proposed sites. It would be irresponsible of our council to consider this for any longer especially when a much safer option is available – the mid harbour outfall option 6 which was the initial choice made by the CCC. Separate from this submission is an idea that may or may not go some way towards a compromise with Ngai Tahu regarding acceptance of a deep harbour outfall. Possible ideas After a warm welcome onto Onuku Marae we gained some appreciation of the Runanga views regarding the wastewater problem. My sister and I thought the following idea may go some way to spiritually cleanse the treated wastewater before its journey to the deep water outflow. Possible ideas It involves a sprayed concrete half pipe meandering its way down the paddock opposite the proposed Waste Water Treatment Plant. This half pipe would be lined with locally sourced rocks, stones, pebbles and coarse sands. It would be wider and slower in places and narrower and faster in other places. Slowed right down in a settling pond where it could then pass slowly over earth with flaxes, rushes and puha before returning to the halfpipe where it would pass over a series of native timbers and rock	

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										waterfalls to invigorate it before flowing into a collection chamber then continuing down to Childrens Bay in the underground pipe to the deep harbour outfall. Important Features · Ngai Tahu would need to oversee the design and construction and selection of locally sourced plants and materials. · Overall length approx. 200m · Completely self-contained, no risk to groundwater or surrounding land. · No use of plastic in any way. · Must flow down Akaroa side of hill. · The wastewater belongs to Akaroa, the residents need to take ownership of the problem and deal with it in a way that isn't detrimental to neighbouring communities. This is only intended as a catalyst for discussion in the hope of reaching a point where Ngai Tahu no longer finds a deep mid harbour outfall so culturally offensive. Harbour Pipeline An economic way of lengthening the pipeline must be found. We have been advised by a long term member of the Akaroa wastewater working party established in 2008, who also happens to be the President of the Takamatua Ratepayers Association that a harbour outfall will still be required in addition to any wastewater to land irrigation proposal. This is the case with Wainui, serving an extremely small population of 34 residents. (One Akaroa restaurant would produce more wastewater on a good day). The fact is that a large area of flat, free draining land is required to deal with the amount of wastewater Akaroa produces. There is no suitable land anywhere around the inner harbour. Discharge to the ocean remains the only viable and or sensible option.	
30.	18		3	2				1	1. The mid-harbour discharge, although the highest initial cost, has the lowest running and maintenance costs, and is the ONLY solution which can be guaranteed to work in all seasons and in all years. The dilution ratio is excellent. 2. Year-round irrigation to pasture is a good concept and may be desirable to some landowners. It offers a productivity increase in dry summers. The proposed land is all clear and of good farming quality. The downside is that it requires continuous management, to harvest the pasture and to dispose of the product, and to maintain the irrigation system. The biggest risk of this proposal (assuming landowner support) is that, every four or five years, we have an exceptionally wet and warm summer. A few years back there was knee-high green grass on most of this land in February, which the farmers were unable to control by grazing and harvesting combined. Additional water would find its way into under-runners and streams, and would affect the residential properties below and would still eventually discharge into the harbour, but at the shoreline! There is also a similar risk in winter-time, when grass-growth is much slower. It is probable that this proposal would need a "safety valve", in spite of the large storage pond. The best safety valve is the pipeline to the harbour. 3. Year-round irrigation to trees is a variant on irrigation to	All these proposals have a significant impact on the residents of Takamatua, not just with the ongoing operations but with the considerable disruptions that will occur while the infrastructure is put in place. Why should Takamatua ratepayers put up with this when we are not even connected to the sewage system!	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. Combining options is possible, but a harbour outfall in addition to another option would be significantly more expensive and would exceed the current project budget. The exception is a combination of irrigation to trees and pasture, which would be a similar cost to either of these as standalone options. If the capacity of the Akaroa wastewater network is overwhelmed in a large storm, overflows to the environment occur. This is the case for all gravity wastewater systems.

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									pasture, and most of the comments above apply. The reason for ranking this option below Pasture is that it is less commercially productive given the quality of the land; however, it does require slightly less land. A mix of the two options would be viable, depending on landowner preferences		Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy.
31.	12	Christchurch	6	6	6	6	6	1	There are currently water run off problems above the houses at Takamatua peninsular. Farm run off is being experienced now causing flooding of properties. This water run off from farm land picks up septic tank overflows which flows down to next property. Any surface reticulation in this area above the houses will only exacerbate this problem currently being experienced If the water outfall of option 6 is as clean as it is said then this pipe should be activated even if it entails sending the pipe further out to the harbour entrance	Option 1 appears to be the most favourable with the Council and local iwi at the moment. This option only shifts the problem from Akaroa to Takamatua who are not even on the scheme. Our significant concern is in regard to surface run off particularly when it rains. We have been informed by CCC that a man would turn off the reticulation system when it rains, really? As owners of Takamatua land we would be opposing the discharge of sewerage above our property at 2 Fantail Lane	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy. For the irrigation options, treated wastewater would be applied to land at rates that meets the assimilative capacity of site vegetation and soils. Generally, sustainable land application systems are operated on a soil moisture deficit basis to ensure that no ponding or runoff to surface waters occurs. Having an appropriately sized storage pond would be essential when soil conditions are unsuitable for irrigation. Therefore, run-off is not expected other than the run-off that already occurs when it rains. The reticulation system would not be turned off when it rains. Instead, treated wastewater would be stored in a storage pond when conditions were not suitable for irrigation (e.g. during rain).
32.	40	Akaroa	4	5	6	2	3	1	1.Listing of options:		The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate

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									1.1 Harbour outfall with extension further out in harbour seems most logical option with least disruption to land and people's lives and livelihood. 1.2 This option appears to have least requirement of land but pipeline A seems an impossibility – how could a pipeline be laid around that mostly rocky shoreline. 1.3 Similar to above. 1.4 Large land required could be a problem requiring huge disruption to land and people, and costly laying of pipes requiring constant maintenance. 1.5 Land requirement etc. as above 1.4 1.6 Less land required but otherwise as points 1.4 and 1.5 <u>2.Unsuitability of Land</u> No doubt most people in Takamatua will consider a harbour outfall the most suitable option. All other options would cause considerable stress with the impact of land uptake and in some cases loss of livelihood. A big concern to all is early and ongoing damage to what is a very vulnerable environment. Those of us who live here have seen the result of even moderate rainfall causing slips which can change the contour of the land. With WWTP pumping more water onto the land there is a strong possibility of subsidence being caused. A question was asked at the second meeting if anyone involved with the planning had actually physically walked over these hills to make an inspection. The answer was "No" Big Mistake! Computers and modern technology provide amazing information but practical knowledge is a necessary qualification. <u>3.Care and Maintenance</u> CCC does not have a good record with this regard in Akaroa (broken pipes, blocked drains etc which take days to be repaired). Pipelines and irrigation systems need constant monitoring. Who will be responsible for this? Who will care for trees etc and if pasture was to be grazed by sheep or cattle who would be responsible for any damage to irrigation pipes etc. Animals are not careful about where they put their feet!! 4.Summary 4.1 A consultancy report from David Painter Consultancy dated 29 January 2016 seems to indicate some doubts and concern about suitability of required land and also quality of discharge into the harbour at various times. Has the Council given any consideration to this report? 4.2 Obviously there has been ongoing discussion with Ngai Tahu for some time but the plan for land in Takamatua to be taken up for Akaroa's WWTP came		at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. We note your concerns about lack of geotechnical investigations and site walkovers, and have asked Beca and PDP to conduct geotechnical investigations and infiltration tests on land that is being considered for irrigation. These investigations have found that Takamatua Peninsula is not suitable for irrigation of treated wastewater and so the Council is no longer considering this location. Other land areas further afield than set out in the consultation booklet are being investigated, including site walkovers and infiltration tests. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. The Council's levels of service set out in its Water Supply Activity Management Plan is for at least 90% of urgent urban leaks to be responded to within 1 hour, at least 90% of medium leaks to be repaired within 1 working day of being reported and at least 90% of minor leaks to be repaired within 3 working days of being reported. The Council measures the performance of City Care as the maintenance contractor against these levels of service. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme. The consultants for the Council have reviewed David Painter's peer review and prepared a response to the peer review. Members of the project team met with the Takamatua Residents Association prior to the formal consultation commencing and the booklets being distributed. Work on the Akaroa wastewater project has been on-going for a substantial number of years. Council staff were only aware that they would need to consult further on alternative options after the resource consent decision when the commissioner only approved the consents for the treatment plant and declined the consents for the mid-harbour outfall portion of the project.

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									as a bombshell! By way of a pamphlet dropped in the mailbox, and a very short timespan to give consideration and to make our submissions. Did nobody give thought to people who had made plans for livelihood and retirement and taking care of the land and now face the possibility of land being taken away. 4.3 Even though we have been assured that the outfall would be drinkable we still hear of concerns in other areas with contamination. 4.4 We consider the situation has been handled rather badly from a public relations point of view. We can only hope that decision makers will take plenty of time over decisions, and be very aware of the concerns of those who are most affected. After all this should not be Takamatua's problem as we all have our own wastewater systems.		Runoff from land is a significant source of contamination in the harbour. The Assessment of Environmental Effects for the proposed discharge of treated wastewater to the harbour found that the proposed Akaroa wastewater treatment plant will produce a high quality treated wastewater which will have very low concentrations of the wastewater parameters that are generally responsible for adverse environmental and public health effects. The results of computer modelling and the subsequent public health risk assessment for the harbour outfall consent application show that under normal viral loads in the community, the infection risk from either contact recreation or shellfish gathering within Akaroa Harbour is very low. Potential adverse effects to marine mammals and other aquatic biota as a result of exposure to contaminants in the treated wastewater are negligible. Recreationalists and other users of Akaroa Harbour will not be adversely affected and their experience enhanced with an improvement in water quality. However, the discharge of treated human wastewater to the harbour is offensive to the Ngāi Tahu parties, and this was one of the reasons the Commissioners gave for declining the consents for the harbour outfall, along with the assessment of alternatives to the harbour discharge being inadequate.
33.	41	Christchurch						1	Our submission is to extend our total disagreement with options 1-5 in the proposal. Option 6 is the safest option in our opinion, although it is not ideal. We have a property at Kotare Lane. Our property is located on the side of an active gully system, putting us at greater risk of slippage in wet weather. From a moisture point of view those options pose significant risk of more slips. Also more under runners than already exist. I personally grew up in Takamatua, born in Akaroa hospital. I am very aware of the way the land behaves in different weather conditions and of the many under runners on the land. After prolonged dry periods like we have just had, when it rains the harbour becomes very discoloured from all the fun off from the under runners and slips. We have just had a rainfall of 100mm in a 24 hour period which caused slippage on our land and surrounding land. With heavy rain, which is frequent in this area, the land becomes saturated and it will not withstand the extra moisture from the irrigation that is proposed. I personally have strong memories of my father clearing slips and dealing with under runners on our farm in Takamatua. I have continued to own land here all my life and now we have our holiday home here and nothing has changed. There are slips and continuing under runners every winter and extreme discolouration of the harbour. It can only get worse and contaminated material going into		We note your concerns about land instability. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.

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									the foreshore if any of these options were to go ahead, putting everybody at risk. I have grave concerns for our future in Takamatua where we plan to retire.		
34.	62	Takamatua						1	Submission re Wastewater Treatment and Disposal Options Akaroa This submission is made on behalf of Janice and Niall Holland, resident at 55 Old French Road, RD 1 Akaroa. We appreciate all the hard work and careful thought that has gone into developing the options for disposal of the wastewater from the Akaroa township. <u>The Sea Outfall is the Most Obvious Option:</u> We struggle to see why any of the alternatives proposed can be considered better than the sea outfall. Each alternative is likely to hold significant long term risks and costs that will greatly outweigh any short term appeal. With a well-functioning treatment plant, the outfall is virtually maintenance free. Whereas each alternative comes with unpredictable future costs but will certainly require substantial ongoing management and maintenance. Resources spent on this cease to be available for other projects which can provide much greater benefits, such as housing for disadvantaged young families etc. While acknowledging that local Ngai Tahu may experience an adverse emotional response to the proposal, there is no effort to deconstruct this in any of the material provided. Given their tragic local history, it is important to understand where this comes from, address any real issue and discharge those that have no substance. With this in mind, we would value a detailed exploration of this objection. <u>The Natural History of Waste</u> When people live in a maritime environment, waste and water go through a natural cycle almost always involving the sea. Nature has evolved to take advantage of this. Sea vegetation thrives on the discharges from the land, including from the breakdown products of human waste. In turn this supports maritime organisms from the simplest to the most complex species. We are part of this and always have been. There something very fulfilling in knowing that a part of ourselves can return to the sea and eventually become part of the food chain that supports future generations. Having said this, it is also important that natural systems are not overwhelmed by sudden change or concentrations of toxic substances. Natural systems take time to adapt. The role of the treatment plant is to ensure this does not		The Commissioners declined the harbour outfall consents on the grounds that alternatives to the discharge to the harbour had not been adequately investigated and because the discharge was offensive to Ngāi Tahu. The Council appealed the decline of the consents and the Ngāi Tahu parties joined that appeal. The Environment Court has directed the parties to the appeal to mediation, and through this process an extensive assessment of alternatives has been undertaken. We note your concerns about land instability. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. The final location of the storage pond has not yet been decided. It would be appropriately designed to the necessary standards to reduce the risk of failure to an acceptable level.

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									happen. Each of us must also play a part in ensuring that toxic waste does not enter the treatment and waste cycle. <u>Objections to the Proposed Alternatives</u> These have been well represented in other submissions but the important points deserve reiteration. 1. Once the local ground becomes water saturated it slips downhill. This is what has shaped the scooped out faces of our local hillsides. The loess carries only a very thin layer of soil to sustain plant life. Forestation may provide some protection but this is not a given and in any case will take many years to be effective. The last three years of experience suggests that rain storms are becoming more frequent and can deliver overwhelming volumes. A consequence of this is that the systems devised to protect flow to the sea may actually permit it to happen in an uncontrolled way, even with holding ponds. We are living through a serious climate change. Past records will not guide us as to how to deal with this. At least a sea outfall allows safe diversion in the case of an overwhelming deluge. 2. How insensitive to propose a waste outlet and storage facility at the only entrance to our town. What does this say that we think of people passing through? And it is the only road entrance. With a significant possibility of ground slippage or inundation causing a failure of the storage pond, our only entrance and exit is put at risk. This does not make any sense. 3. As noted above, each of the ground distribution options will require permanent maintenance. This is costly, especially as it is likely to involve staff commuting from Christchurch. Is this really the way we want to spend our limited resources? What opportunities to protect our poor and enhance the lives of all will be lost to this waste? 4. Over the long anticipated life of the ground distribution systems there is bound to be at least one catastrophic failure due to unpredictable natural events, whether this be earthquake, climate change induced weather events or human error. Over these time-frames something really bad is bound to occur. While this might occur beyond the term and answerability of the present decision makers, it will not be beyond the life of the township of Akaroa. Enough risk is already being generated by the ridiculous location of the treatment plant above the township. Why compound this further? 5. It appears grossly unfair and unreasonable that the people of Takamatua, none of whom will be connected to the sewerage service, will be surrounded by the waste of Akaroa. An important principle in respecting our		

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									environment is that what we carry in we carry out and leave only footsteps. Does the council really believe that this principle, this mauri for all New Zealanders, can be put aside over such an important matter? Would such a failure to respect a fundamental principle stand up to a legal challenge?		
35.	29	Akaroa						1	We do not believe our property is suitable for the discharge proposal and would be against it being implemented. The reasons include; · 1/2 of the proposed area on our property is a walnut orchard composed of 250 10 year old productive trees. There is a premium for organic walnuts and discharge from human effluent would impact on development of the orchard. · The land and soil type is variable. There are areas of thin subsoil and rock with other areas of deep loam or clay. Irrigation would need to apply variable rate to control leaching and manage run-off. It is effectively an old riverbed and subject to flooding. · Riparian areas have been planted out and fenced to enhance the aesthetic and ecological values of the property. We actively manage pests and promote wildlife corridors. The effluent proposal is contrary to the values we have for the land. · We are currently self-sufficient for our water use and effluent disposal. The Takamatua Creek runs through our property which is a source of potable water for Takamatua and Akaroa. No provision was provided for effluent or water for us in building our house in the valley by the CCC. The proposal would run straight through the middle of our farm and would only be of detriment to the property we have worked hard to develop. · We source water from a spring within the area identified for effluent dispersal for our back-up drinking water supply. · There are 3 creeks including the Takamatua Creek transiting our property. All of the proposed area indicated in BLOCK J is impacted by a setback of 25m from a creek leaving a ribbon of potential discharge area through our walnut orchards. We have considered the 6 options being offered for consideration. Our chosen option is: Option 6: Outfall pipeline to the mid-harbour		Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. All irrigation areas being considered in Takamatua Valley are downstream of the Council's water supply intake on the Takamatua Stream. Other than the water supply bores shown on the maps, there are no consented water takes in any of the areas. There may be domestic or stock drinking water takes that do not require consent; these would be taken into consideration if the Council wished to use a specific property for irrigation. A 25 metre set back from waterways shown in Council's GIS (geographical information system) has been used to develop the maps. There may be other small streams; these would be taken into consideration if the Council wished to use a specific property for irrigation. Treated wastewater could be used in Akaroa for all of the options. The wastewater will be treated to a very high standard and could be used for non-potable reuse, such as toilet flushing water, garden watering, boat washing (but not for drinking). However, a pipe to convey treated wastewater for reuse in Akaroa is not within the current scope of the project. Reuse of the treated wastewater for drinking water (potable reuse) was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016. It was discounted due to it being culturally unacceptable to Ngai Tahu and likely being culturally unacceptable to the wider community. Reuse of wastewater as drinking water does not eliminate the need for an alternative disposal method altogether because the reverse osmosis membrane can only process about 70% of the wastewater. The remaining 30% of the flow is discharged as a waste stream, containing all of the nutrients, dissolved solids and other contaminants that were present in the wastewater treatment plant discharge flow. Non-potable reuse was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016. It is estimated that only around 20% of the wastewater could be reused in summer and 10% in winter if a non-potable reuse scheme was installed, and the cost estimate for this is $10.9 million. Therefore, a means of discharging the rest of the wastewater would still

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									The reasons include; · Technologies available mitigate the potential environmental and human health impacts of the discharge and provide for the maximum dispersal. · It has no negative impact on the surrounding land and people living close to the harbour and minimal impact on the quality of the sea water. If the water quality parameters being provided are correct then further refining these enable recycling of water for Akaroa amenity in the future. It could be used for non-potable and potable use in the future reducing the environmental degradation through increased Akaroa demand for water. Summer river flows are low, impacting on stream ecology and restrictions of residential water use. Rural land productivity gains are small compared to this advantage. We are against the dispersal to land in Takamatua. The reasons include; · Land erosion and flooding risk damaging the infrastructure resulting in environmental contamination. Sewage contamination to land is not acceptable to us. · The physical appearance of the infrastructure detracts from the amenity values of the area. Irrigation infrastructure. · Public and personal perception of the area being used for dispersal of human waste. “Takamatua becomes the new Bromley” · Financial impact by decreasing land values and demand due to the above perception. · No benefit for Takamatua land owners as we have had to provide our own systems and are not being given access to the new system. We want innovative thinking. Waste water to be used for greater Akaroa good into the future. · We feel strongly CCC should continue to discharge to the harbour until technology and public will supports using waste water to mitigate potable and non-potable water shortages in Akaroa during the summer months. · This would be a system showcasing Akaroa as an innovative and technologically advanced town with tangible superior environmental protection through smart management of wastewater.		be required. This option is not being progressed at this stage because of the high cost, but could be considered in the future as a partial solution.

Not indicated:

25 submissions (31%)

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1.	64	Christchurch							This is a submission from Andrew Ashby and Bronwyn Hayward, owners of 62 Takamatua Valley Rd. This letter is in addition to the combined submission from the Takamatua Valley residents. We want a safe, sustainable and fair solution for the long term treatment of Akaroa waste water. We share wholly the views put forward by the community letter and wish to submit some additional suggestions. We agree that discharging the wastewater back into the harbour is not an ideal solution, because of concerns about pollution, it is a breach of cultural values, and because it is a waste of usable water, which is likely to become a scarce resource in a changing climate. Demand for re–using the water is also likely to emerge as the population increases, and the availability of water decreases. In the short to medium term the re–use may be for a managed irrigation scheme for trees or even crops (options currently proposed by CCC) or other purposes suitable for grey water. It seems likely that eventually fully treating the waste water to a potable state will become acceptable and maybe necessary, as it already is in many other countries. It seems that we have an opportunity to think about this now. At a minimum we advocate that when the pipework is installed to move wastewater to the treatment plant, adequate pipework is also installed to return treated water back to the Akaroa area. We are very concerned that with the exception of option 6, all other options involve irrigation to land in the Takamatua area only. This particular location seems to be chosen by application of an arbitrary radius of 2km from the plant, on the basis that this will reduce piping cost. We would like to suggest that this radius is increased significantly so that land with a suitable gradient in other locations is also considered. For example land in the valleys and hills behind Akaroa township. Installing infrastructure to reach these areas would be a good start towards the eventual distribution of the wastewater back into the town for “purple pipe” re–use, as this becomes economically feasible. This suggestion also gives more ownership and visibility to the residents and land owners of Akaroa, the producers of the waste water, rather than an “out of sight, out of mind” waste water solution in the neighbouring peninsula and valley, an area from which none of the waste water comes.		Treated wastewater could be used in Akaroa for all of the options. The wastewater will be treated to a very high standard and could be used for non-potable reuse, such as toilet flushing water, garden watering, boat washing (but not for drinking). However, a pipe to convey treated wastewater for reuse in Akaroa is not within the current scope of the project. Non-potable reuse was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016. It is estimated that only around 20% of the wastewater could be reused in summer and 10% in winter if a non-potable reuse scheme was installed, and the cost estimate for this is $10.9 million. Therefore, a means of discharging the rest of the wastewater would still be required. This option is not being progressed at this stage because of the high cost, but could be considered in the future as a partial solution. Reuse of the treated wastewater for drinking water (potable reuse) was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It was discounted due to it being culturally unacceptable to Ngai Tahu and likely being culturally unacceptable to the wider community. Reuse of wastewater as drinking water does not eliminate the need for an alternative disposal method altogether because the reverse osmosis membrane can only process about 70% of the wastewater. The remaining 30% of the flow is discharged as a waste stream, containing all of the nutrients, dissolved solids and other contaminants that were present in the wastewater treatment plant discharge flow. Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.

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									We would like to speak to our submission at the appropriate Infrastructure, Transport and Environment Committee meeting.		
2.	69	Akaroa							We are signatories on the joint Takamatua Valley submission and as such our views on the Akaroa Wastewater Scheme are aligned with that submission. However we do wish to voice our concerns and dissatisfaction with the options in general without "ranking" those Options, because they really are all "least preferred" options! Our land below Block F is quite steep and "oozes" water most of the winter once it is wet and even in heavy rain and wet spells at other times of the year, providing the "clay" layer will not absorb water well and therefore creates a lot of run off. Even our 4WD digger is unable to hold on the water logged ground. Because of the steep slope we have a lot of "run off" into the storm drains, especially evident in the storm ditch on the Eastern Boundary of our property. This water goes straight to roadside "gutters", into the streams and out into the harbour. We are concerned with the fact that bacteria and viruses amongst other waste products will remain in the soil – for how long? Our fruit and vegetables for our own consumption are grown on some of this land – as with most other residents here in Takamatua Valley. We will, before too long, have grandchildren exploring and playing on this land – what affect will these remaining toxins have on them and their health? We would like to think that future generations do not have our "mess" to clean up, and therefore wish to see more in depth investigation into viable options and the long term effects they may have on our environment and our and future generations health.		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. The membrane filtration process will remove almost all bacteria and some viruses. Any surviving pathogens would quickly die off in the soil. It is not proposed to use treated wastewater to irrigate vegetables, but rather pasture or trees.
3.	78	Christchurch							None of the above. Open sea/long distance pipeline our only option	This would be a one off cost. This would be future proofed. Non polluting of the Akaroa Harbour Basin	The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further.
4.	20	Akaroa								As a resident of Takamatua Valley and also one that was born and bred on Banks Peninsula in a farming environment, and has lived most of my life [66 years] on the peninsula, I think that I have a pretty good knowledge of how the land behaves under different circumstances. I, like most other Takamatua residents don't particularly like any of the said options. I challenge the council to start thinking of this growing problem of sewerage disposal as a resource rather than a problem. I understand from the meeting on 7th May that the easiest and cheapest thing we could do with it is to treat it to a drinkable standard and re-use it. Yes, it would take a bit of getting used to but may save a lot of water shortages and	Reuse of the treated wastewater for drinking water (potable reuse) was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It was discounted due to it being culturally unacceptable to Ngai Tahu and likely being culturally unacceptable to the wider community. Reuse of wastewater as drinking water does not eliminate the need for an alternative disposal method altogether because the reverse osmosis membrane can only process about 70% of the wastewater. The remaining 30% of the flow is discharged as a waste stream, containing all of the nutrients, dissolved solids and other contaminants that were present in the wastewater treatment plant discharge flow.

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										restrictions in the future. I understand that it is done in other parts of the world so why not here.	
5.	10	Christchurch							Any of the above options may be suitable - provided that steps are taken to separate 'toilet' matter from the flow, and to reduce the volume to be disposed of. I have inserted below a copy of my editorial explaining this and which appeared in the May 6 edition of The Akaroa Mail. It is not too late to apply some common sense and intelligence to the problem of what to do with Akaroa's sewage effluent. The Council's engineers have applied their usual 'what size pipe is required' approach and come up with half a dozen alternatives to continuing to discharge the treated water into the Harbour. But they still haven't come up with anything that is affordable and at the same time likely to be acceptable to Ngai Tahu as a remedy to the insults to which the Takapuneke area has been subjected for the last 50 years. The best that the engineers can do is suggest that most of the water could be irrigated on to land, with the remainder being allowed to seep out into the Harbour through what is in effect a leaky pipeline along the foreshore. (They call it an 'infiltration gallery', and think it could be done at the end of the peninsula between Akaroa and Takamatua.) Come on lads! (and lassies, these days!). Let's have some new ideas and creative thought about Akaroa's wastewater disposal. Consider, for example, what portion of the sewage flow is the bit which Ngai Tahu are concerned about... is it the veggie-washing water? No. Is it the bathwater? No. Is it the extra water that gets into the system every time it rains? No. Is it the poos and wees? Yes! It is actually only a very small proportion of the total sewage flow which is of concern to Ngai Tahu, and which even if treated to a high standard shouldn't be discharged into food-gathering waters. But what would happen if the toilet waste from Akaroa could be separated out from the main wastewater disposal system and be disposed of through a different system? There is the technology around these days to collect toilet waste in small underground tanks at each household, then grind it up and pump it through narrow-diameter plastic pipes to a central treatment or collection station. It is being used in some Christchurch earthquake-affected areas, and in a new subdivision in Kaiapoi. Setting that up that sort of system in Akaroa would not be much more complicated than putting in fibre broadband. There are also low-flush toilets and so on which would further reduce the volume of water to be processed. While tankering or barging the entire volume of Akaroa's expected effluent to be treated or disposed of elsewhere certainly wouldn't be economic – physical removal of just the offensive parts might well be considered. And what of the rest of the water – the stuff that has been used for washing vegetables or fish or clothes and bodies, and the water that has leaked into the pipes when it rains a lot? Yes, it would be nice to remove it from Takapuneke altogether – but is there so much of a huge rush to do that? It has taken over 50 years to build up to its present volume, and it is not 'offensive' water. What would happen if the Council were to promise to reduce the volume going through to the Takapuneke treatment plant by two per cent each year, so that in 50 years' time no treatment or disposal is carried out there? Some years the Council might work on	Given that extra time has been made available for submissions this is an addition to my previous submission, the editorial I wrote for The Akaroa Mail and forwarded on as a submission, suggesting the separation of 'pees and poos' from other waste water. The matter of cost. Separating 'foul' water from 'grey' water might be seen as too expensive, but it needn't be so. If one is looking at achieving reasonable separation over a 10 year period, and takes it that doing that would delay the need for the currently proposed $15 million scheme by that length of time, then at a discount rate of 5% there is a saving of around $750,000 a year in the opportunity cost of the capital needed. If it takes two drainlayers two days to do the work for each household, and an electrician one day, then there is about one tradesman's work for a week required for each unit. Including materials and overheads that's around $3,000 per connection. So each year it would be possible to pay for 250 separations. Over 10 years that's 2,500 - well over the number of sewer connections, just off the savings by not installing the main plant at the start. Perhaps the grind and pump systems will be a little more expensive than that, but there aren't that many current connections, and over 10 years much of the work will be automatically included as a natural part of new or replacement builds. Once all the separations are done, then there will be an additional cost to install a separate underground reticulation system - but there are savings to be had there too. That's partly because ground-up foul sewage can be passed at pressure through narrow-diameter plastic piping which itself can be passed down the present sewer lines, and partly because any additional grey water lines can be installed simply and shallowly because they won't be containing septic material. Then there are savings in the foul treatment plant and disposal system, which will be able to be much smaller and won't have to cope with the extremes of high and low flow, and in the treatment plant for grey water, where the present Takapuneke plant can probably be used to the limit of its engineering life. When combined with water and waste water reduction measures, and the reduction of infiltration that would be expected with a new system, the overall cost over 20 years should be less than that of any of the current proposals. At the same time my proposal should eliminate the need for any treated 'foul' water from entering the Harbour, and probably mean that even in extreme weather events no treated grey water would need to go out. An innovative system such as I am proposing would be likely to attract at least some research and innovation funding. Yes, there will be some issues with achieving legal compliance - but both the Courts and Parliament are normally sympathetic to well-grounded and researched creative solutions to problems. I urge the Council to at least ask the right people the right questions about whether such a system is achievable for the special place that is Akaroa.	All of the options are within the Council's budget for the project. Year round irrigation to land (Options 1 and 2) do not involve any discharge to the harbour, including via a coastal infiltration gallery. The cost of providing separate grey and black (toilet) water systems for Akaroa would be very expensive (in the order of $11 million) in addition to the cost of providing a wastewater treatment plant and method of disposal. It is an urban myth that grey water is less of a public health risk than wastewater. Monitoring of faecal indicators actually shows similar concentrations in grey water and wastewater. Therefore, grey water would also require treating before being discharged to the environment, further increasing the cost of this option far beyond the project budget. Pressure sewer systems have been installed in parts of Christchurch, but these are used to pump all wastewater including grey water, not just toilet water. Reducing water consumption (e.g. through low flush toilets) would have no effect on the design of the Akaroa wastewater scheme, as it is designed to treat the wastewater load from the town (which is the same irrespective of the amount of water in the wastewater) and high flows during storm events. It is simply not possible to eliminate wastewater altogether. As long as people use water in their houses and businesses for cleaning, washing and flushing, wastewater will be produced. To protect the health of the public, that wastewater needs to be treated and disposed of safely. Septic tanks need a disposal field and are only appropriate on sufficiently large sites. On-site wastewater treatment and disposal is a permitted activity in Rule 5.8 of Environment Canterbury's Land and Water Regional Plan, providing the site is as least 4 hectares, is in an area where the residential density is less than 1.5 dwellings per hectare and where there is not an available sewerage network. Properties in Akaroa township meet none of these criteria. These rules are in place to protect public health and the environment. Composting toilets only deal with toilet waste. Where composting toilets are used, appropriate treatment and disposal of grey water is still required to protect public health.

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									reducing wet weather inflow. In others it might set up water-saving campaigns – such as encouraging low flow showers or front-loading washing machines - which would also reduce the town's water supply requirements. In a 50-year timetable a deadline could be set for the final removal of any toilet waste from the flow that heads to Takapuneke. In the meantime the Council would move towards building and resource consent systems for Akaroa specially designed to reduce waste water flows and input water requirements. Where sites are suitable it could encourage the use of composting toilet systems and septic tanks. It could develop and encourage the use of 'grey' and storm water, treated and untreated, for garden and other non-potable purposes. Yes, there could be some difficulties at the start with the legal stuff – keeping within current consents – but the Environment Court is always open to applications for variation of consent conditions, and with support from Ngai Tahu it should be possible to arrange matters of that sort. It may even be necessary to get the law about how Councils dispose of sewage amended - but why not do that? The cost? It is true that a second underground wastewater reticulation system, even with small pipes, will be expensive – but there will be considerable savings on the town's required water supply, and any new treatment plants needed will be very much smaller, and cheaper. For many years the existing treatment plant and discharge system will be able to be used for processing the non-toilet water.		
6.	77								Thanks you for the opportunity to comment on the Akaroa wastewater options document. You will be aware that the Department submitted on the original application, but did not appeal or join any appeal to the consent to discharge treated wastewater via a pipe outfall to Akaroa Harbour. The Department notes that most of the treatment costs are within a similar order of costs, so that in its view, the option that best meets the requirements of New Zealand Coastal Policy Statement Policy (NZCPS) 23 (See appendix 1 enclosed) within Council's fiscal envelope should receive favourable consideration. The balance of the consented wastewater upgrading (which was not appealed) should have the desirable results of less cross contamination of storm water and wastewater in the Akaroa system. This upgraded water quality outcome is desirable and will give effect to Policy 23 (4) of the NZCPS. The Department is of the view that the consultation process over the document does satisfy the requirements of New Zealand Coastal Policy Statement Policy 23 section 2(b) i) regarding alternative methods and sites for the discharge. <u>Appendix 1 from NZCPS 23</u> 1. In managing discharges to water in the coastal environment, have particular regard to: a. the sensitivity of the receiving environment;		Your submission is noted.

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									b. the nature of the contaminants to be discharged, the particular concentration of contaminants needed to achieve the required water quality in the receiving environment, and the risks if that concentration of contaminants is exceeded; and c. the capacity of the receiving environment to assimilate the contaminants; and: d. avoid significant adverse effects on ecosystems and habitats after reasonable mixing; e. use the smallest mixing zone necessary to achieve the required water quality in the receiving environment; and f. minimise adverse effects on the life-supporting capacity of water within a mixing zone. 2. In managing discharge of human sewage, do not allow: a. discharge of human sewage directly to water in the coastal environment without treatment; and b. the discharge of treated human sewage to water in the coastal environment, unless: i. there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge; and ii. informed by an understanding of tangata whenua values and the effects on them. 3. Objectives, policies and rules in plans which provide for the discharge of treated human sewage into waters of the coastal environment must have been subject to early and meaningful consultation with tangata whenua. 4. In managing discharges of stormwater take steps to avoid adverse effects of stormwater discharge to water in the coastal environment, on a catchment by catchment basis, by: a. avoiding where practicable and otherwise remedying cross contamination of sewage and stormwater systems; b. reducing contaminant and sediment loadings in stormwater at source, through contaminant treatment and by controls on land use activities; c. promoting integrated management of catchments and stormwater networks; and d. promoting design options that reduce flows to stormwater reticulation systems at source. 5. In managing discharges from ports and other marine facilities: a. require operators of ports and other marine facilities to take all practicable steps to avoid contamination of coastal waters, substrate, ecosystems and habitats that is more than minor; b. require that the disturbance or relocation of contaminated seabed material, other than by the movement of vessels, and the dumping or storage of dredged material does not result in significant adverse effects on water quality or the seabed, substrate, ecosystems or habitats; c. require operators of ports, marinas and other relevant marine facilities to provide for the collection of sewage and waste from vessels, and for residues from vessel maintenance to be safely contained and disposed of; and d. consider the need for facilities for the collection of sewage and other wastes for recreational and commercial boating.		

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7.	32	North Canterbury							We do not agree with any of the options as we do not want Takamatua turning into the Bromley of Christchurch. Takamatua and Akaroa get a huge amount of rain in the big southerlies that come through which would result in Effluent run off into the sea which is not satisfactory. We have had a batch at Takamatua since 1965 and have enjoyed many many years of holidaying with our children and grandchildren on pristine unpolluted land and beautiful bird life also many hours of skiing and swimming in the ocean and would hate to see it ruined. We think that Christchurch City Council needs to go back to the drawing board and come up with a better solution.		We note your concerns about land instability. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.
8.	76	Nelson							Introduction 1. These comments relate to the Akaroa Treated Wastewater Disposal Options paper (specifically to Options 1, 2 and 3) and are made on behalf of SEZ Investments Limited. The opportunity to comment on the proposed options is appreciated. 2. SEZ Investments Limited own the land identified on the plan. The land owned by SEZ Investments Limited directly adjoins Block B and is in close proximity to Block E (as identified on the maps relating to Options 1 – 3). These areas are identified as potential discharge areas. In fact Block B appears to marginally extend beyond the property boundary and into SEZ Investment Limited's land and clarification is sought as to where the boundary lies. Effects 3. Based on the information currently available, SEZ Investments Limited is opposed to Options 1,2 and 3 to the extent that this involves the irrigation of wastewater within Blocks B and E, for the reasons summarised below. 4. There is currently insufficient information available on the technical specifications of the irrigation system which is proposed to be utilised. 5. The irrigation of wastewater to land (within Blocks B and E) has the potential to lead to significant effects including (but not limited to) the following: 5.1 Air quality issues, including odour effects for adjoining landowners; 5.2 Increased runoff over adjoining properties; 5.3 The creation of spray drift which carries public health risks; and 5.4 Effects on the amenity of adjoining properties. 6. The above affects also have the potential to negatively impact on the value of SEZ Investment Limited's land.		We note your concerns about runoff over land from adjoining properties. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula (including Blocks B and E) and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. The wastewater will be very well treated and will not have an offensive or objectionable odour. The wastewater from the bypass treatment is slightly less well treated, so may be more odorous. However, this will be mixed with fully treated wastewater in the storage pond, so the combined wastewater is unlikely to be odorous. If a land based option is chosen, this will be assessed in more detail at the next stage of the project. One option to reduce the risk of odour would be to cover the storage pond and provide odour treatment for any air from the pond. The wastewater will be very well treated and will have a low public health risk. The distance travelled by wastewater spray droplets is influenced by droplet size, topography and wind conditions. The low pressure K-line irrigators proposed for the spray irrigation option emit relatively large droplets of water that will tend to settle onto the land surface reasonably close to the spray nozzles. The provision of shelter belts around the boundary of spray irrigation areas will also reduce the risk of spray drift by reducing wind velocities and filtering droplets from air passing through them. It would be possible to turn off the irrigation system automatically when the wind reached a certain speed; this is done at Blenheim. A 25 metre setback from neighbouring properties is proposed for spray irrigation. An assessment of amenity effects on neighbouring properties has not been completed. Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation.

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									7. Although the consultation document states that there will be separation distances between the irrigation system and neighbours, no information is currently available as to the nature of those setbacks and where they would apply. As set out above, currently Blocks B and E extend right to the boundary of the land owned by SEZ Investments Limited. 8. For the reasons set out above, Options 1, 2 and 3 have the potential to be contrary to the objectives and policies of the relevant regional and district planning documents, and Part II of the Resource Management Act. Land Identified for Irrigation 9. It is understood that the irrigation areas have been identified based on a desk top exercise only. SEZ Investments Limited requests to be kept informed of any changes to the proposed areas that could affect SEZ Investment Limited's land and to be consulted in relation to those changes. 10. Should on-site investigations identify the land owned by SEZ Investment Limited as being suitable as a potential discharge area, SEZ Investments would be willing to consider negotiations with Council in relation to the sale of its land for an agreed price (but we signal that SEZ Investments it is not willing to enter into a lease or licence for this purpose).		
9.	47	Akaroa							This submission is from the Harrington Family of 72 Takamatua Valley Road Akaroa RD1 7581 who have owned part of Block F for 57 years and have now 3 Generations Farming this land. As a landowner of Part of Block F Takamatua Valley we want a Safe, Sustainable and a Fair Solution for the long term treatment of wastewater, not just a quick fix, but one that some thought has gone into for the long term for an increasing population, plus a Tourist Town and also the ability to look after and maintain this scheme. We have our doubts about this, after attending all of the meetings. a) We have serious reservations about the capacity of the local soil to absorb the amount of water required, to be put on to the pasture, which primarily consist of hard clay with very little top soil. This area is prone to slips and run off when the soil is laden with water. The rainfall in this area can be up to 14 inches in one stormy hit…Your arial photos to not show the scouring of the land but rather make the land look all flat which it is not. It also does not show where slips have occurred. b) The proximity to homes, roads, streams, and our productive farmland which run off could affect with increased water. c) We ask you to listen to the people of Takamatua Valley as we are the ones affected by this crazy idea. d) This water is not pure it has Viruses, Bacteria and all sorts of nasty things in it making it not suitable for animals to eat the grass, hence a 30 day stand down period is needed after water is put on. Not really		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. The wastewater will be very well treated and will have a low public health risk and a low risk to stock health. It will meet the water quality guidelines for stock drinking water. The treatment plant includes membrane filtration which removes all bacteria and some viruses. In a large storm (expected once or twice a year) the main treatment plant would be bypassed but the wastewater would still be screened, receive primary treatment and UV disinfection, so the risk to health will still be low. Therefore a 30 day stand down period for stock would not be required. The final location of the storage pond has not yet been decided. It would be appropriately designed to the necessary standards to reduce the risk of failure to an acceptable level. The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate

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									acceptable when we are trying to make a living off the land, and who would want to buy the hay, if hay were to be made from the land (no one). e) To put a Wastewater Pond at the entrance to a Tourist Town is really Not in the best interest for Akaroa is it!!! Who knows what this pond could do in really wet weather, and do you have the man power to fix any mistakes quickly, we have our doubts, after seeing a broken water pipe in the main street of Akaroa overflowing for a week before being fixed. f) The only solutions we see are either the Wastewater be pumped out to the Heads of Akaroa Harbour which Onuku Runanga would agree to. (The Amount of money you would have to spend on land application could and should be spent piping it to the Heads). Problem solved or why not pump it to the Cab Stand and let the Wastewater go on waste gorse land at the back of Akaroa. g) We as a family oppose options 1,2,3,4,5, as not in the best interest for our farming land or the people who live in the Takamatua Valley including ourselves. h) We also want to draw the CCC's attention to the Takamatua to Takapuneke Cultural Values report July 2009 which indicates that Block F and Block D maybe affected by area 2, silent file 027. i) This Wastewater scheme does not solve any of the existing problems of discharging into the harbour, and introduces new issues of discharge into the harbour in the vicinity of the Takamatua Peninsula Bay and neighbouring beaches, increasing the risks for safe swimming, other recreational water activities and food gathering which is what we all come to the peninsula for, plus it will pollute spring water which some of us use for our water supply. Please rethink this scheme and work it out, for the best of all party's.		at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has "generally heavy ground swell" and "Loose seabed, bad holding ground". The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. Ōnuku Rūnanga has advised that none of the areas identified as being possibly suitable for irrigation would be affected by any Silent Files. If a year round irrigation to land scheme is adopted by Council (Option 1 or 2), there would be no discharge to the harbour, so there would be no effects on swimming, recreational water activities or food gathering. Other than the water supply bores shown on the maps, there are no consented water takes in any of the areas. There may be domestic or stock drinking water takes that do not require consent; these would be taken into consideration if the Council wished to use a specific property for irrigation. Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation.
10.	33	Vancouver							It has come to my notice that Christchurch City Council proposes to discharge waste water from Akaroa onto flat land in Takamatua. I am opposed to the Takamatua Valley being used as the land is historically unstable and I fail to see how hay can be made if you are to use K line irrigation, as mentioned in options 2 and 3. Should the waste water be discharged into the harbour, I submit that provision for at least some of it to be reused in Akaroa, even if it is not feasible to do it now. While numerous other countries reuse waste water for all uses, including drinking, even though it is considered too costly now; surely in the long term with new technologies, it must become possible. I would like to think my home town was leading New Zealand in this way. I am unable to attend the hearing prior to the Council making its		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Reuse of the treated wastewater for drinking water (potable reuse) was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It was discounted due to it being culturally unacceptable to Ngai Tahu and likely being culturally unacceptable to the wider community. Reuse of wastewater as drinking water does not eliminate the need for an alternative disposal method altogether because the reverse osmosis membrane can only process about 70% of the wastewater. The remaining 30% of the flow is discharged as a

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									decision; however, I look forward to hearing that an environmentally sound decision is made regarding this issue.		waste stream, containing all of the nutrients, dissolved solids and other contaminants that were present in the wastewater treatment plant discharge flow. Non-potable reuse was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It is estimated that only around 20% of the wastewater could be reused in summer and 10% in winter if a non-potable reuse scheme was installed, and the cost estimate for this is $10.9 million. Therefore, a means of discharging the rest of the wastewater would still be required. This option is not being progressed at this stage because of the high cost, but could be considered in the future as a partial solution.
11.	44	Christchurch							I believe we need to be looking at being able to manage the discharge (water) in a more sustainable manner - washing bowl and watery garden.	A better understanding of the impacts and risks of each option need to be better understood. The process is being rushed	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Reuse of the treated wastewater for drinking water (potable reuse) was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It was discounted due to it being culturally unacceptable to Ngai Tahu and likely being culturally unacceptable to the wider community. Reuse of wastewater as drinking water does not eliminate the need for an alternative disposal method altogether because the reverse osmosis membrane can only process about 70% of the wastewater. The remaining 30% of the flow is discharged as a waste stream, containing all of the nutrients, dissolved solids and other contaminants that were present in the wastewater treatment plant discharge flow. Non-potable reuse was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It is estimated that only around 20% of the wastewater could be reused in summer and 10% in winter if a non-potable reuse scheme was installed, and the cost estimate for this is $10.9 million. Therefore, a means of discharging the rest of the wastewater would still be required. This option is not being progressed at this stage because of the high cost, but could be considered in the future as a partial solution.
12.	65	Rangiora							As a bach owner at Takamatua for more than 40 years our family has a strong vested interest in the outcome of the council proposals 1, We wouldn't want Takamatua to become to Akaroa what Bromley is to Christchurch, a suburb whose very name conjures up unsavoury images and makes ones olfactory senses imagine unpleasant odours. We recognise that the engineering for this project is different but nevertheless Takamatua will be known as "the place where Akaroa's poos go" and as such, even if it is only by association there will be a change in perception in peoples minds of what is and has been a very special place, that is rural, pristine and most importantly without land issues other than those naturally occurring. (I have worked in the suburb of Bromley for the last 27 years). 2, It appears that council has got itself into a corner and is fixated on Takamatua being the solution, we feel that the proposed solutions are limited, that the logic and the ideas supporting them		The wastewater will be very well treated and will not have an offensive or objectionable odour. The wastewater from the bypass treatment is slightly less well treated, so may be more odorous. However, this will be mixed with fully treated wastewater in the storage pond, so the combined wastewater is unlikely to be odorous. If a land based option is chosen, this will be assessed in more detail at the next stage of the project. One option to reduce the risk of odour would be to cover the storage pond and provide odour treatment for any air from the pond. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be

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									are not sound as has been demonstrated at the various community meetings on the subject. Our concern is that if one of these solutions is chosen by the council and the concerns expressed by the residents are shown to be real what if any are the fall back positions for the council in other words plan b, c etc. this is not addressed in the disposal options consultation booklet at all and if there are problems it won't be council staff or commissioners or necessarily Akaroa residents who suffer but Takamatua residents i.e. run off, odour or plant breakdowns. 3, Comment. It surprises us that the council are talking about siting this wastewater plant and ponds either side of the main road in out of Akaroa meaning that every single tourist including those on buses from the cruise ships as well every resident will be seeing what has been previously hidden out of the way around at Takapuneke. Why would you want to do this??? 4. To summarize: Akaroa has a sewage problem. Ngai Tahu and the people of Onuku Marae have an opportunity with the support of the hearing commissioners to say that discharging into the harbour has to stop. It feels from our side as if the council has looked in the opposite direction and said Takamatua could be the solution to the Akaroa problem without considering more fully, other possible solutions (editorial Akaroa Mail 06/05/2016). We don't want Takamatua to be the solution to Akaroa's problem. For the very same culturally offensive reasoning that Ngai Tahu have used, the people of Takamatua do not want their 'special place' to be changed, spoiled or threatened with and by these proposals.		presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. Resource consents have already been granted for the wastewater treatment plant, so this is not part of this consultation. The final location of the storage pond has not yet been decided. The editor of the Akaroa Mail has included his editorial as a submission (Submitter #10). Please refer to our response to his submission.
13.	38	Christchurch							We are not in favour of any of the options. Options 1, 2 and 3 irrigation to trees and pasture for all or part of the year is not feasible due to the soil and clay structures on the Peninsula. We note there is not many areas ear marked on the south side of the peninsula for options 1 and 2 presumably because of erosion. We feel that the north side is just as erosion prone as the south side. Options 3, 4 and 5 are close to high value homes and recreation areas. There is a walking track to the end of the Takamatua Peninsula where there is a picnic table and it is one of the most spectacular spots in the harbour. There is also the Children's Bay walkway which is used by locals and tourists on a regular basis. Option 6 - as a default option would only be acceptable to us if the waste water was treated to a drinkable standard and the outfall extended further into the harbour.	We do not believe that CCC has the experience to adequately manage options 1 to 5. The Council leaves water leaks for days if not weeks before they are repaired which is a waste of resources. The latest blatant example was the large leak in the middle of Rue Lavaud from Thursday 2nd June and still leaking Monday 6th June. If this is an example of how long water leaks take to be repaired in Akaroa we shudder to imagine how long it would take to repair any faults in the waste water system.	We note your concerns about land instability. Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. To further treat the wastewater to a drinkable standard would involve additional membrane treatment (reverse osmosis) plus ultraviolet disinfection. The option of an outfall beyond the heads of Akaroa Harbour was considered in the Akaroa Wastewater Selection Options 2008 report (MWH, 2008) and the cost estimate at that time was $28 – 47 million. The pipeline would be 11 km long. The Akaroa Harbour marine chart notes that the Harbour entrance has “generally heavy ground swell” and “Loose seabed, bad holding ground”. The heads of Akaroa Harbour face southward and are expected to experience significant water currents and swells, particularly during bad weather. Outfall construction involves a high degree of risk and complexity due to the nature of the environment (changeable sea and weather

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											conditions, and underwater work in near zero visibility). Due to the high cost and technical difficulty, this option was not considered further. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme. The Council's levels of service set out in its Water Supply Activity Management Plan is for at least 90% of urgent urban leaks to be responded to within 1 hour, at least 90% of medium leaks to be repaired within 1 working day of being reported and at least 90% of minor leaks to be repaired within 3 working days of being reported. The Council measures the performance of City Care as the maintenance contractor against these levels of service.
14.	22	Wanaka								Nimmo family submission to Akaroa Wastewater. 32 Kotare Lane 15/05/16 Takamatua residents are attracted to the area for its outstanding natural landscapes and wildness of native bush, beaches and rocky foreshore. They are getting away from industrialisation. We do not want a pipeline in front of the Bach's (Pipeline option A) on the fragile steep bluffs above the foreshore or open ponds (storage option B at the top of Lushington Road) behind the residential areas downwind from southerly winds bringing odours or insects with ugly fencing around it. A coastal infiltration gallery on the west headland is totally unacceptable as it is located in an area of the last remaining shellfish habitat in that bay. My late Mother-law Pauline Hanrahan and my wife Joanna have been collecting shellfish in that area for 60 years and now our Grandchildren are enjoying that same experience. Many locals and visitors like to walk along that rocky beach also. Any discharges to the sea near the west point of Takamatua (coastal infiltration gallery) could bring Algal Blooms onto the flat beaches of Takamatua, Robinsons, Duvauchelles and Barry's Bay. Blooms would be detrimental for swimmers, skiers and fishers. The disruption during construction and the continuous monitoring of the poo ponds will spoil the enjoyment of the area. Humming pumps, vehicle movements would spoil the ambience of the vacation location. We enjoy walking access over some of the proposed area and have two tracks, one around the headland and the other over to Akaroa with the kind permission of the landowner. These tracks were made and are maintained by local residents, these will be put in jeopardy if some of the proposals go ahead. Our thoughts: The best option that we can see is to compromise with Ngai Tahu and have a summer only irrigation system with willing farmers using a valuable water source to irrigate trees and pasture. This could use the summer flow peaks when Akaroa is busy. A pond at the top of Old Coach Road (storage option A) would have the least visual effect but give summer irrigation storage. The pond location would allow easy irrigation flows to the private land owners in Takamatua.	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. Combining summer only irrigation with a harbour outfall would significantly increase the cost of the project and would exceed the project budget. Any discharge to the harbour of treated wastewater is offensive to the Ngāi Tahu parties. Akaroa Harbour has an average flushing period of 7 days. The Akaroa Wastewater Options Harbour Discharges – Risk Analysis (Golder Associates, 2009) considered the option of discharging on the outgoing tide, but found that it was barely distinguishable from a continuous discharge.

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										From this pond an outfall pipe could be used as proposed in option 6. All winter flows and excess summer flows could be released to the mid harbour timed with a receding tide to take flows out towards the Heads. This also takes away the risk of large rainfalls and 1 in 100 year events causing slips or flooding if all the discharges were going to land. The outflow system is the cheapest to run with ongoing operation and maintenance costs very low according to the Council information and the Farmers can manage their own infrastructure and saves the Council having to manage an on the land system. The Hydrogeological review by Pattle Delamore Partners Ltd in its Executive Summary says that movement of groundwater through the loess can cause tunnel gullies to form and also contribute to land instability as has happened on the southern side of the Takamatua headland.	
15.	7	Akaroa								AKAROA TREATED WASTEWATER DISPOSAL OPTIONS SUBMISSION OF KEN PAULIN 281 BEACH RD AKAROA 7520 PH 304 7012 I have read the consultation document setting out the 6 options, and attended the public meeting on Sat 7th May. SUBMISSION – I have lived on Banks Peninsula and have been involved as a Local Govt Engineer since 1971 until my retirement. I still continue to live in Akaroa and be involved in the community. During my time as County Engineer and Works and Services Manager I have observed the Peninsula in all sorts of weather, very dry, and very wet. No year is the same. I accept the cultural sensitivity of discharging human waste into the harbour, and support land disposal where it can be satisfactorily engineered. In my opinion year round land disposal of all waste water via trees or pasture has too many variables to be acceptable. Any subsidence on the flanks of the Takamatua hills will be attributed to the land disposal, and imposable to prove the disposal has not contributed it the slumping. It will be imposable to detect wastewater entering an underrunner and ending up the harbour Subsurface flow wetland or Infiltration basin above Lushingtons Bay look like the best option to remove some of the liquid and further polish the discharge, but I question why an infiltration gallery on the sea shore, is preferred to a short sea outfall. The mixing from a well designed defuser would result in shell fish gathering standard sea water around the Takamatua Peninsula. The Council has moved the treatment plant from Takapuneke, and has fully investigated land disposal options. Some form of controlled discharge of highly treated wastewater to the harbour is preferable to the uncertainties of irrigating Peninsula hill country. I would like to speak in support of my submission Ken Paulin Civil Engineer (retired)	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. A short outfall is unlikely to be any more acceptable to the community and the Ngāi Tahu parties than an infiltration gallery.
16.	81	Akaroa							Don't consider any of these options are acceptable with the information supplied.	A better technique decision will be made if longer time frame is allowed for review of these options as per recommendations of the Takamatua Rate Payers Association.	The Council is mindful that it needs to balance the costs of detailed investigations of multiple options which may not be progressed against the desire of the community to have sufficient information to express a preferred option.

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											Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.
17.	46	Takamatua							This submission is as residents of Takamatua valley we strongly oppose option 3,4 and 5 as it does not solve the existing problems of discharge to harbour and still has potential contamination risk close to amenity areas of the Takamatua peninsula As Residents of Takamatua Valley we also strongly oppose the discharge onto land in the valley areas currently labelled blocks I ,J, G and F referred to in options 1 and 2 and Block D for the reasons below. 1 We have serious reservations regarding the capacity of the local soils to absorb the quantity of water as the soil types in the area include fragipans that prevent water passage into the layers below. This causes "perching" of the water higher in the soil layers, preventing deeper infiltration. Should discharge to land be obtained we would be concerned not only with slippage of the soils but also with spray drift with the close proximity of residential properties. 2 The area F is immediately above a small settlement with 2 storm water creeks running from the top down to Takamatua valley road and in our case past our house under the road and out to the river to the sea. The storm water creek that effects our property runs adjacent and 3 metres from the house. During the summer this is usually dry but in winter months has been seen as a torrent and several times has flooded the garage to the extent that we had to extend the height of the edge of the bank by five sleepers in order to stop the creek overflowing into the vegetable garden and garage. We are extremely distressed to think that in summer when the council proposes to distribute the majority of the water that this creek will more than likely have more flow or perhaps not a flow but a stagnant seepage that could encourage mosquitos for many		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. The distance travelled by wastewater spray droplets is influenced by droplet size, topography and wind conditions. The low pressure K-line irrigators proposed for the spray irrigation option emit relatively large droplets of water that will tend to settle onto the land surface reasonably close to the spray nozzles. The provision of shelter belts around the boundary of spray irrigation areas will also reduce the risk of spray drift by reducing wind velocities and filtering droplets from air passing through them. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme. The membrane filtration process will remove almost all bacteria and some viruses. Any surviving pathogens would quickly die off in the soil. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options.

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									months of the year. It has also been widely acknowledged by experts that viruses cannot be eliminated by treatment at this stage therefore this option would pose a significant threat to human health. 3 As the stormwater creek comes within the 25 metre buffer zone and just 3 metres from our house the option of using area F unacceptable (9.71 hectares) 4 We consider the proposed area for the waste water storage to be unacceptable as it will sit directly above the only main road in and out of Akaroa. Should there be another major Earthquake this could potentially be a disaster for the township . Also a town relying on the tourism industry having a large sewage pond at the entrance would have a negative impact on the visual environment. There has been several cases where Takamatua residents have been unable to build on or had restricted building consents issued by the council on the case of negative visual impact from the sea. 5 We have serious concerns with the ability for the council to manage and maintain the plant in the future, as recently a broken water pipe on Kotlowski road took over two weeks before it was fixed when there was a water shortage in Akaroa. We feel an independent management body should be contracted for maintenance 6 We also feel that Takamatua is being treated as the poor cousin and that Akaroa residents have no accountability. We would therefore ask a levy be imposed for those that use sewage disposal and that back flow pipes should be laid at the time for further treatment and secondary use of the water in the future. Those residents that have sewage should have a levy charged in order to cover some of the costs for this. 7 Should discharge land be granted Takamatua Residents should have the absolute right to connect to such a sewage scheme 8 We also want to draw the CCC's attention to the "Takamatua to Takapūneke Cultural Values Report" July 2009 which indicates that block F and block D may be affected by Area 2, silent file 027. In conclusion we understand that Ngai Tahu parties have been in negotiation with the council over several years and sympathise		Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation. This would include an assessment of any flood risk. The final location of the storage pond has not yet been decided. The Council's levels of service set out in its Water Supply Activity Management Plan is for at least 90% of urgent urban leaks to be responded to within 1 hour, at least 90% of medium leaks to be repaired within 1 working day of being reported and at least 90% of minor leaks to be repaired within 3 working days of being reported. The Council measures the performance of City Care as the maintenance contractor against these levels of service. Properties that are connected to a reticulated wastewater system already pay a wastewater levy on their Christchurch City Council rates bill. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy. Ōnuku Rūnanga has advised that none of the areas identified as being possibly suitable for irrigation would be affected by any Silent Files.

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									with them and understand their cultural needs but the residents of Takamatua were only given four weeks from the first public meeting and a further two week extension requested by the residents and further meetings that were requested or organised again by the residents therefore we feel this has been a very rushed process by the council and needs further investigation. We would like to speak to our submission at the appropriate Infrastructure, Transport and Environment Committee meeting.		
18.	53								This submission is as residents of Takamatua valley we strongly oppose option 3,4 and 5 as it does not solve the existing problems of discharge to harbour and still has potential contamination risk close to amenity areas of the Takamatua peninsula As Residents of Takamatua Valley we also strongly oppose the discharge onto land in the valley areas currently labelled blocks I ,J, G and F referred to in options 1 and 2 and Block D for the reasons below. 1 We have serious reservations regarding the capacity of the local soils to absorb the quantity of water as the soil types in the area include fragipans that prevent water passage into the layers below. This causes “perching” of the water higher in the soil layers, preventing deeper infiltration. Should discharge to land be obtained we would be concerned not only with slippage of the soils but also with spray drift with the close proximity of residential properties. 2 The area F is immediately above a small settlement with 2 storm water creeks running from the top down to Takamatua valley road and in our case past our house under the road and out to the river to the sea. The storm water creek that effects our property runs adjacent and 3 metres from the house. During the summer this is usually dry but in winter months has been seen as a torrent and several times has flooded the garage to the extent that we had to extend the height of the edge of the bank by five sleepers in order to stop the creek overflowing into the vegetable garden and garage. We are extremely distressed to think that in summer when the council proposes to distribute the majority of the water that this creek will more than likely have more flow or perhaps not a flow but a stagnant seepage that could encourage mosquitos for many months of the year. It has also been widely acknowledged by experts that viruses cannot be eliminated by treatment at this stage therefore this option would pose a significant threat to human health. 3 As we have grandchildren and a stormwater creek is on on our boundary the option of using area F unacceptable (9.71 hectares)		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme. The membrane filtration process will remove almost all bacteria and some viruses. Any surviving pathogens would quickly die off in the soil. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation. This would include an assessment of any flood risk. The final location of the storage pond has not yet been decided. It would be appropriately designed to the necessary standards to reduce the risk of failure to an acceptable level. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme.

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									4 We consider the proposed area for the waste water storage to be unacceptable as it will sit directly above the only main road in and out of Akaroa. Should there be another major Earthquake this could potentially be a disaster for the township. Also a town relying on the tourism industry having a large sewage pond at the entrance would have a negative impact on the visual environment. There has been several cases where Takamatua residents have been unable to build on or had restricted building consents issued by the council on the case of negative visual impact from the sea. 5 We have serious concerns with the ability for the council to manage and maintain the plant in the future, as recently a broken water pipe on Kotlowski road took over two weeks before it was fixed when there was a water shortage in Akaroa. We feel an independent management body should be contracted for maintenance. 6 We also feel that Takamatua is being treated as the poor cousin and that Akaroa residents have no accountability. We would therefore ask a levy be imposed for those that use sewage disposal and that back flow pipes should be laid at the time for further treatment and secondary use of the water in the future. Those residents that have sewage should have a levy charged in order to cover some of the costs for this. 7 Should discharge land be granted Takamatua Residents should have the absolute right to connect to such a sewage scheme 8 We also want to draw the CCC's attention to the " Takamatua to Takapūneke Cultural Values Report" July 2009 which indicates that block F and block D may be affected by Area 2, silent file 027. In conclusion we understand that Ngai Tahu parties have been in negotiation with the council over several years and sympathise with them and understand their cultural needs but the residents of Takamatua were only given four weeks from the first public meeting and a further two week extension requested by the residents and further meetings that were requested or organised again by the residents therefore we feel this has been a very rushed process by the council and needs further investigation.		Properties that are connected to a reticulated wastewater system already pay a wastewater levy on their Christchurch City Council rates bill. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy. Treated wastewater could be used in Akaroa for all of the options. The wastewater will be treated to a very high standard and could be used for non-potable reuse, such as toilet flushing water, garden watering, boat washing (but not for drinking). However, a pipe to convey treated wastewater for reuse in Akaroa is not within the current scope of the project. Non-potable reuse was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It is estimated that only around 20% of the wastewater could be reused in summer and 10% in winter if a non-potable reuse scheme was installed, and the cost estimate for this is $10.9 million. Therefore, a means of discharging the rest of the wastewater would still be required. This option is not being progressed at this stage because of the high cost, but could be considered in the future as a partial solution. Ōnuku Rūnanga has advised that none of the areas identified as being possibly suitable for irrigation would be affected by any Silent Files.
19.	67	Takamatua							I object to all the proposed disposal options for the Akaroa Wastewater scheme <u>Background</u> Before clarifying the reasons for my objection I wish to outline some background regarding the		The terms of reference for the Akaroa Area Water Services Working Party were approved on 20 October 2008. While water supply is included in the terms of reference, the only tasks assigned to the working party related to wastewater. Christchurch City Council at its meeting on 8 December 2011 received the recommendations of the Akaroa Wastewater Working Party and resolved that:

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									Akaroa Wastewater Treatment and Disposal situation. I was a member of the CCC sponsored working party that was charged with looking at the options for solving the Akaroa WASTEWATER and WATER issues. This committee met and engaged actively on the wastewater issues, culminating in a recommendation that was presented to the CCC. The water working party was never activated by CCC and decisions such as the redirection of the Takamatua water supply and the L'Aube Hill Treatment plant proceeded without any input from that working party. The wastewater recommendation include some key elements · Relocate the treatment plant from the current site because of the importance of that site in New Zealand's and the local Maori history. · Remove the discharge to the harbour in favour of land reuse options · Undertake trials to investigate the ability of the Peninsula soils and plants to reuse the wastewater. The CCC response was to relocate the treatment plant, but to make application to the Environment Court for a continuation of the Harbour outflow, all be it in a different location in the harbour. Clearly this was not in accordance with the recommendations from the working Party. I am also a member of the Duvauchelle Wastewater working party. This is another working party that is getting to meet very infrequently and appears to be paying lip service to the CCC requirement for community consultation. I have a keen interest in the Duvauchelle wastewater being used as an irrigation source for the existing golf course. I have visited and spent significant time with the course superintendents at Twin waters and Noosa Springs Golf Courses to discuss their reuse of wastewater. From those visits I learned the importance of the plant types and the dosage rates used. I pushed very hard (for a long time without success) for the infiltration trials to be started as recommended by the Akaroa wastewater working party. Eventually this discussion reached the point where the CCC response was "that because of the earthquakes there was no money to start trials". I noted that for the trials and data collected to be effective it needed years of information and testing and that time was running out for both the Akaroa and Duvauchelle harbour disposal consents. I then offered to fund the $75,000 cost of the trials myself, with the CCC to pay me back when they could afford it. The outcome was that CCC found the money and commenced the trials almost immediately. I also pushed for planting trials as it was clear from the Australian golf course visits that different plant types thrive or otherwise with the wastewater irrigation. I have attended the Akaroa CCC presentation on the currently presented 6 options. In that presentation 2 glasses of water were put up as being examples of the quality of treatment liokely to be achieved by the proposed new Akaroa plant. The glasses were from a visit that representatives of the Working Party and CCC made to the Turangi treatment plant at the Southern end of Lake Taupo.		*(a) The Akaroa Wastewater Working Party be thanked for its valuable work over the last three* *years.* *(b) A replacement wastewater treatment plant for Akaroa be located away from Takapuneke* *Reserve, and that staff discuss siting options with the Ōnuku Rūnanga and community, and* *report back to the Council within six months on suitable potential sites.* *(c) The outfall for the treatment plant be re-located to the middle of the Akaroa Harbour and* *that consideration be given to measures to address cultural concerns, in consultation with* *Ngāi Tahu.* *(d) The new treatment plant be designed to produce wastewater that achieves the best quality* *wastewater available at the time, and that the design of the plant enable the potential future* *beneficial re-use of treated wastewater for domestic, commercial or agricultural purposes.* *(e) Should suitable land become available, a land irrigation trial be costed and presented to the* *Council for consideration.* *(f) Environment Canterbury be advised of the working party outcomes adopted by the Christchurch City Council.* The Duvauchelle Wastewater Working Party has been meeting once or twice a year. Since mid-2014, Lincoln University has been conducting a lysimeter study on soil cores taken from the Akaroa Golf Course at Duvauchelle and the Takamatua Peninsula. Treated wastewater has been applied to the soil cores at varying rates to determine the acceptable irrigation rate, the quality of leachate and the effect of the treated wastewater on the soil. In addition to this, Lincoln University started a trial irrigating wastewater to various native plant species in March 2016 and this is continuing. Both studies are funded by the Council and the results will be used to inform the design of any treated wastewater irrigation scheme. The two glasses of water in the presentation given were correctly labelled. The label "Eff" (which is short for effluent) can be seen on the right hand glass. The slide from the presentation is below, along with a close up view of the photo showing the label.

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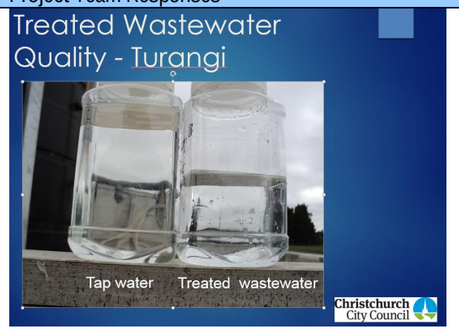
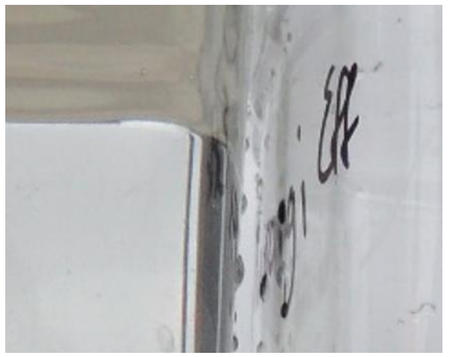
									The clear glass was titled as the treated water, with the yellowy coloured glass noted as the tap water. I was the one who had requested those 2 glasses of water when visiting the Turangi Plant. The yellowy coloured water was in fact the treated water. I challenged Mike Bourke on this issue and he responded that he could not remember which was which when he put the slides together. I actually drank the treated water as a test for the advisors present that it really was drinkable quality. I am very concerned that misleading information is being presented as part of the CCC staff presentation on this issue. What other information is not factual in what we have been presented? <u>Reasons for my Objection to the Proposed Disposal Options</u> · Option 3, 4, 5 These are completely unacceptable as they will locally degrade the recreational and food gathering activities that take place regularly in the area of the discharge to the sea. · Harbour Outfall There is insufficient information supplied to properly assess this option. For this to be a workable solution the following is required: · The discharge wastewater must be fully drinkable standard including the latest in hormone, antibiotics and xxx treatment. These treatments are to be upgraded as the technology advances on a max 5 year basis. · The discharge control has to be to a proven mixing zone in the harbour with the discharging timed to the outgoing tide periods only. · The storage ponds required are to be odourless and managed to prevent mosquito or other pest growth. · The operation is to be silent with no disturbance to the Akaroa or Takamatua neighbourhoods. · Takamatua is to be included in the reticulated sewer system at no cost to the inhabitants. · Land Irrigation Solutions There is insufficient information supplied to properly assess the options. <u>For this to be a workable solution the following is needed</u> · The discharge wastewater must be fully drinkable standard including the latest in hormone, antibiotics and viral treatment. These treatments are to be upgraded as the technology advances on a max 5 year basis. This upgrading is to be part of the consent conditions for the plant. · A clear solution for the situations where the ground or trees cannot EASILY uptake the applied water. This solution must ensure no overland run off or discharge to adjacent properties or water ways. A harbour pipeline is the likely best overflow solution. However that water that passes through that outfall MUST be drinkable quality and not some lesser treatment as currently proposed. · The required land area must be clearly identified. Much of the land noted as possible at present is not suitable. It is within the		  Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. There is extensive information about the harbour outfall option in Volume 1 - Application: Akaroa Wastewater Scheme Upgrading - Resource Consents Application and Assessment of Effects on the Environment (CH2M Beca, June 2014) and Volume 2 - Appendices: Akaroa Wastewater Scheme Upgrading - Resource Consents Application and Assessment of Effects on the Environment (CH2M Beca, June 2014). The proposed treatment plant will treat the wastewater to a very high standard and represents current best practice. The removal of antibiotics and hormone contaminants in wastewater treatment processes is a complex process involving various mechanisms such as absorption, biological degradation, chemical degradation, and filtration. Overall, a proportion of antibiotics and hormones are expected to be removed by the treatment process but the removal efficiency cannot be stated with certainty. Requiring five yearly upgrades to an already high specification treatment plant is unrealistic and not warranted. To further treat the wastewater to a drinkable standard would involve additional membrane treatment (reverse osmosis) plus ultraviolet disinfection. The additional treatment plant cost is estimated at $2 million, which would exceed the project budget for almost no environmental benefit. The currently proposed discharge quality would be virtually undetectable beyond the mixing zone. Akaroa Harbour has an average flushing period of 7 days. The Akaroa Wastewater Options Harbour Discharges – Risk Analysis (Golder Associates, 2009) considered the

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									exclusion zone from the Akaroa/Takamatua water take is too close to existing streams or has other issues. Presenting this land as being potential solutions is causing an instant emotive reaction from those directly affected and does not allow a realistic appraisal of the options The irrigated wastewater must be distributed without noise or visual effects. The K line solution will be noisy and will have over spray issues. It is also unattractive on the landscape. A dripper line solution is quieter and when placed underground is not visible. · The plant operation needs a clear maintenance and management plan. This is critical for the evaluation process so that we as residents of Takamatua can have confidence in the proposed solution and also have a standard to measure against should the proposal proceed. · The proposed storage ponds MUST be odourless at all time and managed to prevent any mosquito or other bug growth. There is no information about this at all in the information supplied to date. · There has to be a separation zone with protection planting between the wastewater discharge and the neighbouring properties. · Takamatua must be reticulated to the plant prior to its opening. This is a compromise that will include the local Takamatua sewer situation whilst adding Akaroa and Takamatua wastewater above the community. <u>Summary</u> In the presented form none of the proposals are acceptable. They appear to have been thrown together and lack the necessary detail and technical presentation to enable a fair evaluation. Insufficient time has been allowed for us as submitters to get the technical input we need to properly review the options. I personally have met with Andrew Dakers and have engaged a planning consultant for specialist advice. Neither though have had sufficient time to read the background information and properly advise on the CCC proposals. The Working Party gave clear guidelines to CCC many years ago as to the preferred solution. That solution should have been and needs to be thoroughly researched and designed and that design presented to the Community. To be taking a second bite at the Harbour Outfall solution is manipulative. That same manipulation has existed in the presentation to the public with the labelling of the glasses of water to give best effect to the quality of the treated water. There is no doubt that CCC is running out of time to solve the discharge consent issue. However that is of their own making. The best decision needs to be made. If that requires more time, but with monitoring of the CCC progress more time needs to be made available. The current process has simply caused anger and poorly researched reactions.		option of discharging on the outgoing tide, but found that it was barely distinguishable from a continuous discharge. There is no requirement in the Resource Management Act or the Proposed Canterbury Air Plan for any activity to be odourless. The wastewater scheme will not emit an objectionable or offensive odour beyond the boundary in accordance with the statutory requirements. There is no requirement in the Resource Management Act or the Proposed Christchurch District Plan for any activity to be silent. The wastewater scheme will meet the noise limits of the District Plan at the boundary. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme. Further information about the storage pond can be found in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016) which was provided to you on 12 May 2016. A 25 metre buffer zone to neighbouring properties is proposed for spray irrigation and a 5 metre buffer zone for drip irrigation. The consultation period was extended by 3 weeks at yours and other's requests. Further formal public consultation will be undertaken once the Council has selected its preferred option. Wastewater sludge (solids) will be transported to the Christchurch Wastewater Treatment Plant for conversion into biogas and biosolids for beneficial reuse, as is the case at present. When the capacity of the wastewater network is overwhelmed by a large storm, overflows to waterways will occur, as at present. With the increased capacity of the reticulation system, and with the replacement of a large proportion of Akaroa's wastewater network, the frequency and volumes of these overflows will reduce. The method of disposal of treated wastewater has no effect on these overflows, and there will be no overflows of treated wastewater.

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									I strongly reject the present proposals. They bare poorly thought through and inadequately designed. I do support reuse of the wastewater in a properly treated and researched design. That design must include · Quality of Treatment · Proper research and design of the Storage ponds and ALL their effects · Proper research and definition of the reuse volumes and how they will be reused · Full research and design solution for the reuse of the solid component of the process · A properly researched and implemented overflow solution · A full maintenance and performance monitoring regime, including defined and accepted targets · An upgrade path for the plant on a 5 yearly basis as technology improves · Investigation and implementation of additional reuse options such as third pipe solutions · Inclusion of a reticulation system to Takamatua before the plant begins operation I do wish to speak to my submission at the hearing.		Non-potable reuse was one of the long list options considered in the Akaroa Wastewater Concept Design Report for Alternatives to Harbour Outfall (CH2M Beca, May 2016). It is estimated that only around 20% of the wastewater could be reused in summer and 10% in winter if a non-potable reuse scheme was installed, and the cost estimate for this is $10.9 million. Therefore, a means of discharging the rest of the wastewater would still be required. This option is not being progressed at this stage because of the high cost, but could be considered in the future as a partial solution.
20.	68	Takamatua							I writing to make a submission regarding the proposed options for Akaroa Treated Waste Water disposal. I firstly want to state that it is difficult to support one particular option over the other without knowing what checks and balances would be in place to ensure that one option is in fact better than any other. While my preference is for the land disposal option year round irrigation to either trees or pasture using ground level drippers, at this stage there are many issues that would need to be addressed first before I would give my support to this option. My concerns are: · Have the best land options near and around the Takamatua hills been selected? · What will actually happen if the landowners whose land has been identified as being suitable refuse their consent, what other land sites would then be deemed suitable? · What checks/tests would be put in to monitor that the water leaving the wastewater storage tanks prior to dispersal is in fact at a guaranteed potable level? · What time intervals would be used to ensure that the waste water to be dispersed is always at potable quality? · What would happen to the wastewater if the water is not at a potable level?		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. If a land based option is selected, the Council hopes to acquire the land through lease, license or purchase with willing property owners. It is hoped that compulsory purchase under the Public Works Act will not be necessary. The Council does however have the option of pursuing compulsory purchase if sufficient land is not available. At this stage it is very difficult to predict the likelihood of this action. One of the grounds for the decision of the commissioners to decline the harbour outfall consents was because of a lack of assessment of alternatives. While land irrigation had been previously considered as an option in the Akaroa Wastewater Options and Risk Analysis (Harrison Grierson, ecoEng and Golder Associates, February 2010), this was only for properties where there was a willing seller. Environment Court decisions have directed that the assessment of alternatives must consider all practical alternatives, and this includes compulsorily acquiring land through the Public Works Act if necessary. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply.

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									· As the soil on the hills at Takamatua is fine silt during heavy rain falls it becomes very prone to slips, so how will this land be monitored in a heavy rain event? At what time during, or even before, a heavy rain period would waste water stopped being dispersed? Who exactly, from which office, and how immediately would this person make the decision to stop spraying the waste water to ensure that the land disposal sites would not become saturated? · What will happen in the event of a major issue regarding the storage or disposal of the waste water? At Queen's Birthday weekend I was angered to see that there was water flowing down the street from a burst water main. This was in fact day 4 of water flowing from this burst pipe! There was a real irony to then find a pamphlet in our letterbox giving us suggestions on how to conserve water. How quickly and what guarantees would be put in place to immediately fix any problems with the treatment plant, storage tanks or the dispersal lines? · Takamatua households must be included in this project at the same time as Akaroa households. · What ongoing checks will be made on the trees and/or land to ensure the health of both if/when spraying is underway? I am not at all in favour of waste water being discharged into the harbour. Any waste water sprayed on to land or around trees must be done with ground level drippers to ensure there is no spray drift or noise.		There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme. The details of this, including how the irrigation system would be turned off during wet periods, have not been determined yet, but would be if this was the selected option. The land irrigation system will be operated with the goal of not significantly increasing the risk of instability over and above that which occurs naturally. This will be achieved through monitoring soil moisture content, ceasing wastewater application when land has reached a specified moisture level, and by not applying wastewater to land during the winter months for the option of irrigating pasture. The final treated wastewater quality would be measured on a regular basis to make sure it met the limits set out in the discharge consent, which is yet to be obtained. Once the Council has applied for a discharge consent, it is likely to be publically notified by Environment Canterbury and members of the public can submit on the consent application, including on matters such as treated wastewater quality and monitoring frequency. The Council does not propose to treat the wastewater to a potable standard, as this is not required for the receiving environment. To further treat the wastewater to a drinkable standard would involve additional membrane treatment (reverse osmosis) plus ultraviolet disinfection. The additional treatment plant cost is estimated at $2 million, which would exceed the project budget for almost no environmental benefit. The Council's levels of service set out in its Water Supply Activity Management Plan is for at least 90% of urgent urban leaks to be responded to within 1 hour, at least 90% of medium leaks to be repaired within 1 working day of being reported and at least 90% of minor leaks to be repaired within 3 working days of being reported. The Council measures the performance of City Care as the maintenance contractor against these levels of service. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy. The distance travelled by wastewater spray droplets is influenced by droplet size, topography and wind conditions. The low pressure K-line irrigators proposed for the spray irrigation option emit relatively large droplets of water that will tend to settle onto the land surface reasonably close to the spray nozzles. The provision of shelter belts around the boundary of spray irrigation areas will also reduce the risk of spray drift by reducing wind velocities and filtering droplets from air passing through them. It would be possible to turn off the irrigation system automatically when the wind reached a certain speed; this is done at Blenheim. The disposal scheme would be designed to meet the noise requirements of the District Plan, which sets noise limits to be met at the property boundary. The sprinklers would not be noisy and would be in keeping with the rural environment.
21.	70	Christchurch							We object to all the proposed disposal options for the Akaroa wastewater scheme. We therefore have not rated them in any order. This appears to be an ill-conceived process with the residents of the Takamatua settlement and Valley being asked to inherit the results of poor decision making.		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website.

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									Whilst we would probably favour a sustainable discharge to land process we don't believe there is sufficient information currently available to allow us to make an informed decision. Some of our concerns are · The ability of the soil type to allow the absorption of moisture to the ground below when saturated. · What will happen to this excess moisture when the ground becomes saturated to avoid overland flow. Some proposals show the discharge area being directly opposite Sandy Bay which is probably the most recreational area in Akaroa Habour. · Have servicing and maintenance costs of dripper or irrigation systems been adequately considered. · Some of the disposal areas appear within some of the Ecan community water exclusion zones. · The popular existing Takmatua/Childrens Bay walkway appears to penetrate through some of the discharge area. · Will there be planting to the separation zones between wastewater discharge areas and neighbouring properties. · How will proposed storage ponds be kept odourless and free of mosquitoes etc at all times. What monitoring is proposed. · How do we ensure that discharge wastewater is kept to a drinkable standard and how is this monitored. · How will advancements in technology be incorporated into future treatment processes going forward. · How will operation of irrigation/plant be kept silent to avoid disturbance to adjoining neighbourhoods. What monitoring is proposed. How will Takamatua residents be included in the reticulation scheme at no cost to each landowner given it is proposed around us.		These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. For the irrigation options, treated wastewater would be applied to land at rates that meets the assimilative capacity of site vegetation and soils. Generally, sustainable land application systems are operated on a soil moisture deficit basis to ensure that no ponding or runoff to surface waters occurs. Having an appropriately sized storage pond would be essential when soil conditions are unsuitable for irrigation. Therefore, run-off is not expected other than the run-off that already occurs when it rains. Historical rainfall data has been used to size the storage pond and irrigation area, to make sure that there is sufficient storage so that irrigation rates are no more than the assimilative capacity of the soil. Operations and maintenance costs have been estimated for each of the options and these will be taken into account in the decision making process. If by ECan community water exclusion zones you mean the community drinking water protection zones, these have been excluded from the areas being considered for irrigation of treated wastewater. If spray irrigation is the selected option, shelter belts will be planted around the irrigation area. The wastewater will be very well treated and will not have an offensive or objectionable odour. The wastewater from the bypass treatment is slightly less well treated, so may be more odorous. However, this will be mixed with fully treated wastewater in the storage pond, so the combined wastewater is unlikely to be odorous. If a land based option is chosen, this will be assessed in more detail at the next stage of the project. One option to reduce the risk of odour would be to cover the storage pond and provide odour treatment for any air from the pond. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. The Council does not propose to treat the wastewater to a potable standard, as this is not required for the receiving environment. To further treat the wastewater to a drinkable standard would involve additional membrane treatment (reverse osmosis) plus ultraviolet disinfection. The additional treatment plant cost is estimated at $2 million, which would exceed the project budget for almost no environmental benefit.

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											The proposed treatment plant will treat the wastewater to a very high standard and represents current best practice. It is not proposed to include further upgrades to the treatment plant. Consents for the treatment plant have already been obtained. The wastewater disposal scheme would be designed to meet the noise requirements of the District Plan, which sets noise limits to be met at the property boundary. The sprinklers would not be noisy and would be in keeping with the rural environment. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy.
22.	37	Akaroa							I am certainly not keen to see the waste water discharged on to any of the Takamatua land near residential properties. Substantial testing is still needed to properly evaluate the soil discharge options but, regardless, if Takamatua is lumbered with this waste material there will very likely be a negative impact on our environment and property values that is irrecoverable. Even if the waste is deemed potable, public perception will always regard our community as the waste solution for Akaroa, and my understanding is that there will remain a number of substances in the waste 'water' which are not desirable, and no one will be keen to drink it! Options 4, 5 and 6 involve potential contamination of both our wonderful Takamatua Bay and the Akaroa harbour, rendering those options unacceptable. There is the potential to harm food sources and to damage the recreational value of the area. Options 1,2 and 3 present difficulties because of the geology of the land. The slopes are variable and the soil types include fragipans that prevent water passing down layers below. This limitation on drainage means that there is a real potential for erosion problems as the waste water fails to seep into the land where intended. The hillsides are filled with under-runners and the introduction of waste discharge will likely create an extension of these soil erosion problems. We have had experience with such seepage from leaks to the CCC water supply above our property (on Kingfisher Rd) which resulted is a significant cost by way of a retaining wall construction. Drainage into the soils may be useful in dry conditions but in wetter winter conditions run-off may likely be a problem. Furthermore, above the ground driplines will be subject to damage by hares, rats and other vermin. The lines would need to be well protected and regularly maintained for reliable discharge. Any leaks would flow downhill to residential areas in some cases, as proposed. In this regard, the proposed 25m set-back from residential areas or waterways would appear to be grossly inadequate. A further concern is the potential for mosquito breeding in the storage ponds, particularly in the warmer times. We don't need to add to the growing wasp problem.		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. For the irrigation options, treated wastewater would be applied to land at rates that meets the assimilative capacity of site vegetation and soils. Generally, sustainable land application systems are operated on a soil moisture deficit basis to ensure that no ponding or runoff to surface waters occurs. Having an appropriately sized storage pond would be essential when soil conditions are unsuitable for irrigation. Therefore, run-off is not expected other than the run-off that already occurs when it rains. Historical rainfall data has been used to size the storage pond and irrigation area, to make sure that there is sufficient storage so that irrigation rates are no more than the assimilative capacity of the soil. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options.
23.	79	Christchurch							Akaroa Wastewater Scheme – Comments from the Takamatua Ratepayers Association Inc.		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover

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									Introduction The Christchurch City Council has put forward six options for consideration for the disposal of wastewater that will result from the Proposed Relocated Akaroa Wastewater Treatment Plant. The Takamatua Community and the environments of concern extend from the Valley to the Bay. The options under consideration have a major impact on the Takamatua community and the environment. It is therefore essential that any decisions of the Council be made having the best available information so that informed and robust decisions are made. The Takamatua Community are the ones who will have to live most closely with the consequence of any decision. This is a project which will have long term consequences for community. As such it is essential that the Takamatua Ratepayers Association Inc (Association) can have confidence in both the process and the outcome of this project. This is an important project and the Association is taking its participation seriously to ensure the best outcome is achieved for the community. It is acknowledged that the Christchurch City Council in its feedback form has asked for each option to be ranked in order of preference. However at this time, and based on the current information available, the Association is not in a position to make an informed judgement on which is its most preferred option. The Association is clear that any option of an infiltration gallery around the foreshore of Takamatua Bay is not acceptable (Options 3, 4 and 5). These options will have adverse effects on the intrinsic values of the Bay, the value of the area for food gathering and the value of the area for recreational use that are not capable of being remedied or mitigated. Therefore the only acceptable outcome is that these effects be avoided and therefore options 3, 4 and 5 should be discarded. Matters of Concern The Association recognises that the information presented on a number of the options has been based on a desktop study. The level of detail available on the options is insufficient for the Association to make any informed decision as to preferences. With respect, the association submits that the current level of information is also insufficient for the Council to base such an important decision on. Therefore at this time the Association objects to all options. At this time: · There is a lack of detail on each option which means that the Association cannot have confidence that the advantages, disadvantages and cost for each option are accurately presented. · Relying on a desk-top study is not sufficient to ensure that the options as presented are feasible. This means there is a lack of confidence that the options presented will achieve the quality of discharge and disposal necessary for any proposal to be acceptable to the community and the environment. Two examples illustrating that the level of information currently available is insufficient to make any informed consideration of the options are provided. Firstly, for the land disposal options areas of land have been identified as potential disposal area that fall		letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated. None of the irrigation areas are within an exclusion zone for a water supply intake. Other than the water supply bores shown on the maps, there are no consented water takes in any of the areas. There may be domestic or stock drinking water takes that do not require consent; these would be taken into consideration if the Council wished to use a specific property for irrigation. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. It has also been designed based on permanent and holiday populations to 2041. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy. The proposed treatment plant will treat the wastewater to a very high standard and represents current best practice. It will remove almost all bacteria including E. coli. Consents have already been granted for the treatment plant. The Council does not propose to treat the wastewater to a potable standard, as this is not required for the receiving environment. To further treat the wastewater to a drinkable standard would involve additional membrane treatment (reverse osmosis) plus ultraviolet disinfection. The additional treatment plant cost is estimated at $2 million, which would exceed the project budget for almost no environmental benefit. The removal of antibiotics and hormone contaminants in wastewater treatment processes is a complex process involving various mechanisms such as absorption, biological degradation, chemical degradation, and filtration. Overall, a proportion of antibiotics and hormones are expected to be removed by the treatment process but the removal efficiency cannot be stated with certainty. Operations and maintenance costs have been estimated for each of the options and these will be taken into account in the decision making process. During the detailed design phase extensive risk assessment is carried out to ensure a long term and reliable system. For example we already know that the treatment system will be a dual train system to facilitate maintenance or breakdown. Standby generation will be in place to ensure continuity of power supply. There will be a robust operations and maintenance contract in place for the treatment plant and disposal scheme.

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									inside the exclusion zone for water intakes meaning they cannot be used for the identified purpose. Secondly, in considering the land disposal options it is not evident that the particular soil characteristics of the land, the absorption capacity of these soils, the potential risk of further slippage in combination with the climatic characteristics (rainfall and flood events) of the area have been adequately considered. Based on a desktop study there can be no confidence that the areas identified are appropriate. · The level of information presented, in combination with the short period of time available to consider the options has meant that the Association has not been able to obtain detailed advice it needs to determine a preferred approach. The matters under consideration are highly technical and need to be subject to critical and detailed examination. The Association has sought and received some preliminary technical advice identifying some potential issues with the various options. This has also identified that to determine the appropriateness or otherwise of the options further detail would be required. Therefore, all of these factors in combination mean that a preferred option cannot be identified at this time. · The potential discharge into the environment is not of the Takamatua communities making. However, it is expected to accept the consequences. There are a number of issues and potential adverse effects that the Ratepayers Association is very concerned about. The current information available on the options is not sufficient to provide any certainty or security that these adverse effects are capable of being appropriately addressed. These potential issues and effects are associated with a number of the options. Therefore, while not in a position to express a preferred option the Association is taking this opportunity to identify a number of the matters it is particularly concerned about. Any option selected must address these matters. <u>The particular matters of concern are:</u> 1. Takamatua must be included as part of the reticulated scheme before any option is selected. 2. Any option must be developed and future proofed to ensure that long term development within Akaroa, Takamatua and Robinsons Bay is accommodated, as well as ensuring seasonal impacts from residents and visitors to these areas are accommodated. 3. All new builds must be future proofed, including a third pipe being installed. 4. The treatment and disposal option selected must represent the best standard and practice available. 5. The Community will not accept any treatment and disposal scheme where the discharge is not to a potable standard and will not accept any discharge that does not treat for hormones, antibiotics and e coli bacteria. 6. The evaluation of options and the selection of the preferred option must consider and appropriately address:		We note your concerns about trees creating a fire hazard and if this option was chosen, this would be taken into account in the selection of tree species and the design of the irrigation scheme. The final treated wastewater quality would be measured on a regular basis to make sure it met the limits set out in the discharge consent, which is yet to be obtained. The application will include an assessment of environmental effects. Once the Council has applied for a discharge consent, it is likely to be publically notified by Environment Canterbury and members of the public can submit on the consent application. There is no requirement in the Resource Management Act or the Proposed Canterbury Air Plan for any activity to be odourless. The wastewater scheme will not emit an objectionable or offensive odour beyond the boundary in accordance with the statutory requirements. The disposal scheme would be designed to meet the noise requirements of the District Plan, which sets noise limits to be met at the property boundary. The sprinklers would not be noisy and would be in keeping with the rural environment. The issue of public access to walkways on private land will be discussed with the land owners and if there is a wish that these be retained every effort will be made to retain them where they are or to relocate them to appropriate routes. There will be no flow on effect from the water held in storage as the storage pond will likely be lined and covered. For the subsurface flow wetland options (Options 3 and 4), there would be no water on the surface, and for the infiltration basin options (Option 3 and 5), the water would pond on the surface for a short time only before draining away. There would be no ponding on the surface for the irrigation options (Options 1 – 3) as the wastewater would be applied at low rates. So there would be no opportunity for mosquitos to breed for any of the options. If spray irrigation is the selected option, a 25 metre buffer to neighbouring properties with a shelter belt are proposed. The distance travelled by wastewater spray droplets is influenced by droplet size, topography and wind conditions. The low pressure K-line irrigators proposed for the spray irrigation option emit relatively large droplets of water that will tend to settle onto the land surface reasonably close to the spray nozzles. The provision of shelter belts around the boundary of spray irrigation areas will also reduce the risk of spray drift by reducing wind velocities and filtering droplets from air passing through them. Before any decision is made to irrigate any particular parcel of land full consideration will be given to the existing land uses and the impacts of irrigation. The desktop study assumed a separation distance of 25 metres from waterways. If irrigation is the chosen option, the separation distance would need to be confirmed at the next stage of the project. The streams will not be inundated with nitrogen as the rate of application is such that there will be little or no runoff. Providing a reticulated wastewater scheme for Takamatua is not part of this project, and is not in the current Long Term Plan. If you would like this included in the 2018 – 2028 Long Term Plan, please make a submission to Council when consultation opens for the Long Term Plan. However, the new treatment plant has been designed to include flow from Takamatua in the future. If a reticulated wastewater scheme was provided to Takamatua, ratepayers would need to pay full wastewater rates, regardless of whether they connected to the scheme or not, in accordance with Council's rating policy.

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									a. The whole of life cost for the scheme, including ensuring operational capability can be maintained for the life of the scheme and that this can occur in a cost-appropriate manner. b. Ensure that the infrastructure and any site works such as vegetation planting can be appropriately managed over the life of the scheme, including ensuring contingencies are in place if there is damage from natural hazards, such as fire, floods, storms or earthquakes. It is important to ensure that contingencies are in place to ensure that contaminated water can be managed and not inappropriately discharged during these events, and if trees are planted that there are contingencies to manage any potential fire risk. c. Management requirements of the scheme and the discharge, including ensuring that regular monitoring and reporting occurs including of water quality, soil quality and other environmental impacts. Any monitoring and reporting must include appropriate management responses to address issues that may arise during the life of the scheme. 7. Environmental effects must be capable of being managed in a manner that ensures: a. All actual or potential health impacts of the discharge and current and future use of both land and water are avoided. This includes ensuring that nutrient levels of any discharge do not impact in any way on human and animal health. b. Any discharge (both quantity and quality) must be appropriate for the particular characteristics of the land or water it is to occur in. The particular soil types, ground conditions, absorption rates, land stability and runoff patterns (ground and surface water) of the area must be subject to detailed evaluation before determining whether areas are capable of accommodating any discharge. Any option must include sufficient contingencies to that inappropriate discharges do not result (i.e. at times when soil is saturated, or in times of flooding). c. Any project must not negatively impact on the ability of the environment to sustain wildlife and the ability for land and waterbodies to be suitable for food production and food gathering. d. Any project must not impact negatively on land values of the immediate and wider environment and must not negatively impact on the actual or perceived visitor or tourism experience in the area. e. Any option must not negatively impact on the amenity or enjoyment of the environment by residents or visitors. This includes ensuring: i. Any odour is prevented at all times. ii. Noise does not negatively affect any visitors or residents of the area. iii. Any scheme does not result in negative visual effects affecting visitors or residents. iv. Any scheme does not negatively affect any public access, walkways or other recreational resources of the area. v. No pest species (such as mosquitos) results from any waterways, storage ponds or disposal areas established for the scheme.		The draft technical report on land based options was peer reviewed, and the final options report incorporated the recommendations of the peer review. The peer review and the CH2M Beca response to the peer review can be found on the Akaroa wastewater page on the Council website. A peer review of the Beca options report was undertaken by David Painter. The Council will seek a peer review of the irrigation scheme if this is the selected option. If the Takamatua Ratepayers Association wishes to obtain another independent peer review, this will need to be paid for by the Takamatua Ratepayers Association. While the Council is happy to consult with the Takamatua Ratepayers Association, this will be on the Council's terms, not as listed. Any specialist advice obtained by the Takamatua Ratepayers Association will need to be paid for by the Takamatua Ratepayers Association and will not be paid for by Council.

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									vi. If the option selected includes spraying that no spray drift occurs and if necessary all boundaries are planted to avoid any drift. vii. Any planting undertaken for any option is maintained over the life of the project, including the management of any pest species within any planted areas. viii. Any discharge must not occur in a location, or in a manner, where it has any direct negative impact on any residential dwelling, potential future dwelling or adjoining land use. This includes ensuring that no spray drift or seepage of any discharge occurs. ix. Any discharge must not negatively impact on any waterbodies, including both natural and artificial waterbodies, such as drains. <u>Outcomes sought</u> As identified earlier in this submission the Association wishes to ensure that it can have confidence in both the process and outcome of this project. It has reservations with the process to date, in particular with both the quality of information and the limited time available to consider and obtain advice on the options. However, it considers it is not too late to overcome these deficiencies and move forward with the Christchurch City Council in a positive manner. The Association considers itself a key stakeholder in this project, with an interest greater than the general public. It seeks to work with Christchurch City Council and other stakeholders to ensure that the best outcome for the community is achieved. <u>The specific outcomes the Association wants to achieve are</u>: 1. That Takamatua be included in the reticulated sewer scheme before any new plant begins operation. 2. Following this consultation round all feasible options remaining be subject to an improved evaluation process (beyond a desk top study). 3. All options subject to the improved evaluation (above) be subject to an independent evaluation and review. This is not a peer review of the Christchurch City Council evaluation. But is an independent review which addresses the concerns and welfare of those immediately affected by the proposed options, being the Takamatua Community. The brief for the independent review is to be determined and agreed by the Takamatua Ratepayers Association and any report is to be provided directly to the Association. The costs of this independent evaluation and review are to be paid for by the Christchurch City Council. 4. The Takamatua Ratepayers Association is to be recognised as a key stakeholder in this project and as a consequence of this the Christchurch City Council agrees that: a. The Association be included as part of any future consultation and review process including evaluating and determining the preferred option and in the preparation of any necessary resource consent documentation and process. b. The Association be recognised and included as part of any future consultation and review process for the design, operation and monitoring of the plant and any		

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									implemented solutions that affect the environment c. The Christchurch City Council agree to pay the fees of specialist advisors appointed by the Association in order to: i. review the further evaluation of options, ii. review any information relating to the selection of a preferred option, iii. considering any design and operation information relating to the selected option, and iv. participate in any resource consent process, including review of applicant material, preparation of submission, preparation and presentation of evidence and any hearing, if necessary. This submission is lodged on behalf of the Takamatua Ratepayers Association Inc. The Takamatua Ratepayers Association Inc. would like to speak at the appropriate Infrastructure, Transport and Environment Committee meeting prior to the Council making its decision.		
24.	23	Rakaia							We think Takamatua would be unsuitable for wastewater disposal, as the soil is deep clay base and the wastewater would run off into the natural waterways that come off the hills. The result would be wastewater would enter the bay.		Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November.
25.	82									As a ratepayer and bach owner in Takamatua we are concerned that the submission made by the Takamatua Ratepayers association does not reflect the feeling of the majority of residence as it may suggest. Not all ratepayers receive correspondence from the association, in fact very few do judging by the email list .We have been a paid up member for three years and never received and correspondence. Having spoken to a large number of residence over the last few months and meeting even more at the meeting at the Akaroa Marae, not one resident was happy about any of the six options and none were aware of the ratepayers associations proposals re being included in the reticulation scheme as a tradeoff for accepting either options 1 or 2. The Association may consider themselves a key stakeholder but their submission does not reflect the majority of members nor residence views, as very few residence attend their meetings and even less receive the minutes and newsletters. At the last meeting in which the vote was made for such conditions required to be met in order for their cooperation, the vote was by no means unanimous and many residence were left furious at the agenda some had in being included in the reticulation scheme. Not to mention the cost we would have to pay whether we connect to it or not. All Takamatua properties are on septic tank, they have no problem with their waste water. Akaroa have a problem. It is not Takamatua's problem. Takamatua residence should not be forced to choose one of only six very unacceptable options in Akaroa's bid to upgrade their treated	Preliminary geotechnical investigations, including test pits and infiltration testing, were undertaken on some of the possible irrigation sites at the end of May 2016, and a cover letter and two reports presenting the findings have been received. These can be found on the Akaroa wastewater page on the Council website. These land investigations have found that Takamatua Peninsula and Blocks F and H are not suitable for irrigation of treated wastewater and so the Council is no longer considering these location. Other land areas further afield than set out in the consultation booklet are being investigated and the results of these investigations will be presented at a public consultation meeting at the Gaiety Hall in Akaroa, at 1:30pm on Wednesday 9 November. Options 3 to 5 are not supported by the community or the Ngāi Tahu parties, so the Council is not considering these options further until land based options have been more fully investigated.

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										wastewater scheme, nor accept it being dumped on their land just because Ngai Tahu have objected to the current schemes upgrade proposal. One of the Takamatua Ratepayers Associations provisions is that the wastewater be of potable standard and free of e coli bacteria, hormones and antibiotic etc. If this standard is to be reached then it should be acceptable for option 6 to be reconsidered. After all the wastewater is already going out to the sea. Why is 99% cleaner water suddenly unacceptable and everyone determined to discharge it elsewhere to keep Ngai Tahu happy. It doesn't make it alright to make everyone else unhappy, especially the Takamatua community when they are already happy, and it's not even their wastewater therefore not their problem. Because the majority of properties both at the beach and bay of Takamatua are baches, it is the view that they don't matter. Many owners are of the belief the council will do whatever they want whether they object or not. Because they are part time in the bay a lot of owners are too busy to be concerned with this enormous proposal. Especially those still struggling with earthquake issues as do we. We have been coming to Takamatua almost every weekend for the last three years to get away from the EQC politics and are quite frankly exhausted. Fantail Lane properties gets water runoff from the farmland above and many of the properties have had problems in heavy rain. The farmer cut several vertical tracks some years ago which now directs water straight into the properties below. We have spent 10s of 1000s redirecting water from our properties. We do not need the risk of more water flooding our properties by surface or under runners, nor the risk there could be contamination to add to the problem. If it's clean enough to discharge it on the land it's also clean enough to discharge it to the sea. All residence in the Lane will be affected by all options but less by a pipeline option. We strongly object to options 1-5 and urge the council to consider an option that is future proof and does not compromise Takamatua residence in any way.	