



FRIENDS of Banks Peninsula Inc.

Akaroa's Community Environment Society since 1990

Akaroa Treated Wastewater Options Consultation (2020)

FIRST DRAFT SUBMISSION

Released August 7th, 2020 for
Public Comment and Support

Includes:

Executive Summary and Short-form Submission

- Visit www.friendsofbp.co.nz to endorse this submission any time up to August 22, 2020.
- We welcome feedback to: info@friendsofbp.org.nz
- Final submission will be released August 20
 - It will include your feedback and our Long-form submission backed by expert legal, engineering and quantity surveyor opinions
- We encourage you to make a personal submission. Please read our notes for assistance

Executive Summary

Friends of Banks Peninsula Inc. has been closely involved with the Akaroa wastewater issue since 2007. In its submission to the Council's consultation in 2017 the Society advocated a staged approach toward recycling the wastewater back into Akaroa to address its chronic water shortages. Reuse gained the most public support of all the options offered in that consultation.

Since then the need to treat water as a precious resource and build future resilience has escalated with Akaroa experiencing greater water restrictions, the impacts of climate change being better understood and the revelation about massive levels of infiltration into the Akaroa sewer network.

Safe treatment and disposal of Akaroa's sewerage is an essential service. A new treatment plant and disposal system requires a very substantial investment of funds and must be safe, efficient and sustainable well into the future. It must be as risk free as possible because the need for sewage treatment cannot be 'switched off' if a system fails.

The sudden and on-going shock of the COVID-19 pandemic has further highlighted the need for resilience and fiscal prudence, but the Council is now faced with an enormous escalation in the costs of the Akaroa wastewater system. The options proposed are similar to those proposed in 2017 but costs have increased by between 116% - 245% since then. The water volume is more than double that previously used due to the amount of storm and groundwater infiltration in the old pipe network.

We consider it would be a gross misuse of public funds for the Council to construct a costly new wastewater system that is massively bigger and more complex than it needs to be, and at the same time lacks capacity for future expansion, lacks resilience to the effects of climate change, and fails to address Akaroa's water issues.

In coming to this view we have kept abreast of developments via the Akaroa Wastewater Working Party, reviewed the technical documents, taken professional advice and conducted community meetings to understand the public views. Our findings on the options now being proposed by the Council are:

- All the options proposed are extremely expensive. For each of the 830 connections in Akaroa, Council will need to spend \$57,000 - \$68,000, requiring it to allocate substantial additional funds to the \$35 million already budgeted in the Long Term Plan for the project.
- The land based options fail to provide sustainable management because they are disposal rather than re-use schemes, direct the water away from Akaroa where it is most needed and do not address the infiltration issues.
- Extremely high levels of storm and ground water infiltrating through a broken pipe network increase the volume of water and the size of the system, and exacerbate the issues, uncertainty and risk.
- The land based options inherently limit the volume of wastewater that can be dealt with, and are at risk of being undersized. The area of land for disposal and size of storage ponds rely on highly sensitive modelled assumptions including:
 - the ability to irrigate year round,
 - the level native trees uptake nitrogen,

- infiltration levels,
 - minimal population growth, and,
 - weather patterns based on historical data rather than future predictions.
- These risks are exacerbated for the Inner Bays Irrigation option due to the scarcity of suitable land for expansion, proximity of large storage dam and irrigation to houses and disposal to catchments that drain to shallow mudflats. We strongly oppose this option because it fails to provide for social, economic and environmental wellbeing and, because of the risk of failure, may not meet Ngāi Tahu cultural concerns.
 - We submit that these risks may be manageable for the Goughs Bay option because the Council plans to purchase the entire large farm, it is distant from houses and the catchment drains to the open ocean.
 - We are more concerned about Pompeys Pillar option because the area for tree planting is an exposed coastal headland, the social impacts are greater and costs are higher. We oppose this option while Goughs Bay is on the table.
 - The Harbour Outfall option provides the beginnings of a re-use network for Akaroa and returns the treated wastewater to Akaroa where it is needed. We do not oppose it, but see it as the first step toward a genuine beneficial re-use system.
 - We consider a Harbour outfall would be appropriate and consentable if the Council finds Goughs Bay and Pompeys Pillar to be not practical due to cost or other matters. However, we would be disappointed if the Harbour Outfall and only a minimal purple pipe system was the end result and consider that at the very least some form of treatment to address Ngāi Tahu cultural concerns must be included. Harbour Outfall should be seen as a means to enable long term re-use.

Our community has consistently asked for the water to be treated to the highest standard and re-used in Akaroa, not disposed of to the surrounding communities.

We advocate a stage solution that first fixes the broken pipe network in Akaroa. This improves the long term resilience of the system, reduces the likelihood of raw overflows and enables the design of an appropriately sized system.

We seek genuine beneficial re-use through treatment to the highest standard (drinkable/potable) so that the water becomes an asset and can be reused in Akaroa during times of shortage and the remainder dealt with in a way that recognises cultural concerns and improves the environment for the whole community.

This would meet with the Council's Integrated Water Strategy, result in a solution built for the future and enable the Council to be in step with new government initiatives

<Note: we will provide further information on the proposed solution in the final release of the submission on August 20. This will also include our technical Long Form submission and the views of our expert legal, technical and quantity survey experts.>

Shortform submission

Christchurch City Council has a difficult problem that it needs to address - the disposal of Akaroa's wastewater. It has been hunting for a solution since 2007 and this is the fifth time it has consulted on the issue.

At the last round of consultation in 2017, the community expressed a strong preference for a re-use solution to address Akaroa's chronic summer water shortages. However, this consultation had to be abandoned because the solutions proposed were designed based on faulty data and significantly undersized. No hearings were held, but a staff report summarising the community responses was released.

In the three years since, while the search for alternative solutions has been underway, the need for re-use in Akaroa has become even more apparent. Last summer, (2019/20) a total outdoor watering ban was abruptly introduced after stream levels dropped precipitously. The public and government agencies are much more aware that climate change will increase the frequency and intensity of storms and droughts, as the impacts begin to be felt around the country. Scientific research has revised predictions for the worse. Akaroa is identified as a settlement that is likely to be water stressed in the future¹. The Resource Management Act has been amended to require particular regard to the effects of climate change.

We share the disappointment expressed by the Akaroa Treated Wastewater Reuse Options Working Party in its Joint Statement. The land based options now being proposed are substantially the same as those on offer three years ago, but with the added problem that there is now more than double the volume of wastewater to deal with, due to the massive levels of infiltration through leaking pipes. Genuine reuse in Akaroa, where the water is most needed, is once again pushed down the list of priorities, and plans to fix the sewer pipes are conservative and substantially fail to deal with the problem.

The three land based disposal systems presented are all flawed, and none more so than the Inner Bays Scheme explicitly favoured by the Council staff. While the harbour outfall solution is an improvement over the previous one as it now includes the core infrastructure for beneficial re-use, it still fails to address the cultural requirements.

Hence in this submission the Friends of Banks Peninsula is once again asking the Council to design a holistic solution that facilitates re-use of the water in Akaroa. This argument has become even more compelling given the impending impacts of climate change and the susceptibility of the network to infiltration

Consideration of Options in the Consultation document

Our response to the first consultation question – presented as a simplistic choice between disposal to the harbour or to land - is to consider first the conditions under which a harbour outfall *could* be granted. Our legal advice concurs with that set out in the Consultation document. A Resource Consent could be granted for a harbour outfall provided other options have been adequately considered and none are found to be practical. Our submission therefore examines the options first before making this judgement.

We find that all of the land based options presented by the Council are flawed.

- All the irrigation options proposed are disposal options, aimed at getting rid of the water. Native trees have been selected to absorb the water, rather than pasture based options, because they enable winter irrigation and therefore reduce storage requirements.

¹ CCC Infrastructure Strategy 2018-2048 pp52,100

Nevertheless, they all require major earthworks and construction of massive storage ponds to facilitate the disposal on the minimum feasible areas of land.

- Whilst establishing some small new areas of native bush brings benefits, it comes at a very high cost. A genuine biodiversity and carbon sequestration project would seek to maximise the area of native trees and minimise destructive and carbon emitting construction. The area would be as large as possible to provide maximum benefits. The extra \$10 million or more that the land-based options would cost could instead secure thousands of hectares of marginal land for native regeneration and ultimately sequester more than a million tonnes of CO₂.
- Disposal of wastewater to intensively planted native trees is a first for New Zealand. The land and storage requirements are based on theoretical modelling that is highly sensitive to assumptions, particularly around the ability to irrigate throughout the winter. Should any of these assumptions prove incorrect then the storage and land irrigation areas will be too small – resulting in the need for system expansion or release of water, along with nutrients and other potential contaminants, to streams. The anticipated level of nutrient leaching for the Inner Bays option could be as high as that of a dairy farm.
- Population growth parameters are also minimal. There is insufficient growth capacity to reticulate the residential areas of Takamatua.
- The water is directed away from where it is most needed - in the Akaroa catchment from which it emanates. Re-use of the wastewater in Akaroa would be a major step to resolve this most pressing sustainability issue.
- No outflow buffer is incorporated into the system, meaning water will leave the treatment site without testing for compliance. This leaves storage ponds and the irrigation fields at risk of receiving inadequately treated water.
- The Inner Bays option would require consent as a non-complying activity, due to its reliance on some level of discharge to a water body. It carries considerable economic, social and environmental risks due to the complexity of the system proposed. Common risks such as odour or midges and engineering risks are compounded by the proximity to populated areas and downstream infrastructure.
- Goughs Bay would be a discretionary consent and would require pumping the wastewater over the crater rim to an outer headland area. This brings pluses and minuses – there is a longer pipe and that carries some risk, but the system is barely visible, much further from any houses and has room for expansion should it turn out to be undersized. However, the system has raised environmental concerns from locals passionate about the biodiversity of the area, and the landowner who was at one stage a willing participant has become alienated by the process and withdrawn his support. The ability to successfully establish irrigated native trees is unknown, given the altitude and exposed nature of the site.
- Pompeys Pillar is similar, but less practical than Goughs as it is more expensive and impacts heavily on a multi-generational farm.

While the options fail to provide a sustainable use of the wastewater the test pertinent to the decision between harbour and land options is whether there has been adequate consideration of alternatives to a coastal marine discharge and whether alternatives have been shown to be not practical.

In our view Goughs and Pompeys are technically feasible because they:

- Can take all the water without relying on achieving an infiltration reduction target or the ability to purchase multiple parcels of land.

- Have scope for expansion on site should modelling assumptions prove incorrect and more land is required – we regard this as an essential precaution for a hitherto untried land-based disposal system.
- Are much further from any houses or populated areas, do not have infrastructure downstream and the catchments drain to the open ocean. These factors reduce the risk of problems or failures causing major liability or political issues for the Council, and outweigh the relatively minor risk of maintaining the longer pipe.

The Inner Bays solution is however not practical because it:

- Relies on the Council managing to purchase several private properties – one of which is potentially earmarked for another public purpose.
- Critically relies on achieving at least a 20% reduction of inflow and infiltration (I&I) up-front, without making this a budget priority (the budget is capped).
- Relies on modelling assumptions around the wetland function, tree canopy intercept rates, storm frequencies and nitrogen uptake. There is little scope for error because the expansion capacity is very limited and the catchments drain to shallow inner harbour mudflats. Further private properties will need to be purchased if the system is undersized.
- Exposes many people and private properties to risk due to the close proximity to communities, large storage pond above houses threatening downstream infrastructure if it fails, and use of a significant heritage listed site in a historically sensitive area.
- Creates greater impacts on Akaroa itself with substantial earthworks at Pond Site 10 at the town entrance, and laying the pipe along SH75, adding to the effects of constructing the new Wastewater Treatment plant and terminal pump station, along with substantial network alterations.

In coming to these views we have taken into account:

- The sensitivity of land-based options to modelling parameters and the impacts and costs if the sizing is too small or there are other issues such as field failure.
- The impacts of the consented components of the Akaroa Wastewater project on the overall environment, to which the disposal option will be additive.
- The consent thresholds
- The relative costs of the land based options when set against the risks. We have some questions around relative costs and suggest that both the Goughs Bay and Pompeys Pillar costs could be considerably reduced (the latter partly because of a substantial error in the presented costings).

We have then looked at the impacts and sustainability of the Harbour Outfall option.

- A harbour outfall would present the lowest risk as it uses proven technology and is the simplest to operate. It provides the greatest degree of certainty and resilience as it is not inherently limited in the volume of water it can process, and is entirely gravity fed. It will require the least energy and has the lowest operating cost.
- The disposal of the treated wastewater to the centre of the harbour would mean its rapid dispersal. The outfall would be much further away from the shore than the current outfall, negating impacts of nitrogen or nutrient build up.
- In terms of social and environmental wellbeing the Harbour Outfall scores well. There is no need to acquire private land, no treated wastewater storage ponds required, no risks from irrigation failure and no visual effects.

- In terms of sustainability, while the outfall itself is a disposal option, the option directs the water through Akaroa where it is most needed, rather than constructing infrastructure elsewhere. The pipe would be run through the town providing the core infrastructure for a purple pipe re-use system in Akaroa. This is markedly different from the scheme for which consent was declined in 2015 and is now based on the Friends of Banks Peninsula submission to the 2017 consultation.
- The addition of the purple pipe system provides reassurance that water will always be treated to the consented standard as an outflow buffer pond is included at the treatment site and the water will receive additional UV treatment prior to release from the site.
- The first stage of the purple pipe re-use can come on stream at the minimal extra cost of \$270,000 (as opposed to \$3.7 million for the land based options).
- While the design as planned does not address the Ngāi Tahu cultural concerns, we urge the Council to work with Ngāi Tahu to explore whether a wetland or some other form of land-contact could be used to achieve this— particularly if the Harbour Outfall is part of a staged pathway toward a long-term sustainable solution maximising water re-use.

Consideration of Costs

Costs are an important factor when considering the practicality of the land based options.

In our view the consultation document has been disingenuous in its presentation of the costs. The options proposed are for the disposal of the treated wastewater, but the costs presented include the construction of the new Wastewater treatment plant, terminal pump station and pipe network that have already been consented. These are a constant across the options and account for approximately \$30 million of the total cost of each. Operating costs of the treatment plant and the disposal options have also been bundled together. Taking out the costs of the treatment plant, the relative differences between the proposed disposal options are:

Table 1 Costs of the disposal component of each option

Option	Capital cost	Operating cost
Harbour outfall	\$18 million	\$0
Inner Bays	\$27 million	\$40,000
Goughs Bay	\$35 million	\$177,000
Pompeys Pillar	\$40 million	\$177,000

We are concerned about the validity of these costs. A re-costing exercise was carried out by the Council in March 2020, during which the cost of the consented Treatment plant and ancillary works was increased by \$6 million, the cost of the Inner Bays disposal was reduced by \$10 million and the cost of the Harbour Outfall was increased by \$8 million. These substantial differences from the most recent figures produced by Beca result from large changes to overheads and contingencies, markedly increased costs of overland pipes and reduction in planting costs and various other additions and omissions. The Pompeys Pillar cost appears to be in error.

A new wastewater system must be safe, efficient and serve the community well into the future. In considering practicality and weighing costs the Council must consider the ongoing operational costs and the risk of future costs if the system does not perform as required, or greater capacity is needed. Council should also take into account the additional funds that will still be needed to improve Akaroa’s water supply and to fix the sewer pipe network.

A better future-looking solution

We would be extremely disappointed if, after all these years, the Council now settled on the Harbour Outfall without first reconsidering more holistic solutions. This could involve a higher treatment standard, appropriate cultural treatment, maximising re-use in Akaroa and then residual discharge to a water body such as the streams in the Akaroa catchment from which the water was originally taken, or to the Harbour. Another option could be re-use combined with Managed Aquifer Recharge.

The Working Party was discouraged from progressing investigations of such mixed mode solutions by Council staff. However, the Inner Bays option favoured by staff relies on discharge to a water body – using the wetland concept developed by the Ngāi Tahu parties. Without this discharge in wet years, the Inner Bays scheme would be the most expensive option, if it could be made to work at all.

The wetland concept is a positive development and potentially key to finding a workable solution to this difficult problem of meeting cultural requirements and at the same time building future resilience by maximising water re-use and allowing disposal of any unwanted water (particularly in winter) either to a water body or aquifer. It is a pity that the Working Party was not able to discuss expanding its use to other solutions.

As the prolonged search has shown, finding a 100% land disposal option on Banks Peninsula is extremely difficult due to the topography, and the resulting options are extraordinarily expensive. This difficulty is greatly compounded by the huge volume of infiltration, particularly because this infiltration is worst during wet weather when disposal by irrigation is restricted or infeasible.

We cannot see how it could be sustainable management to spend many millions of dollars building a wastewater system that is extremely expensive per connection, but leaves Akaroa with its sewer network of broken pipes, increasingly vulnerable to climate change effects including raw sewage overflows, and Akaroa town with worsening water shortages.

In September 2019 the Council adopted its 'Integrated Water Strategy'. This recognises that water is a taonga, fundamental to the life of our communities. It is an overarching strategy that sets a vision and framework to manage water resources in an integrated way over the next 100 years. It sets goals and objectives for infrastructure efficiency and resilience through integrated three waters (water supply, wastewater and surface water) management and a proactive risk-based approach. This includes ensuring the sustainability of water supplies and wastewater systems, understanding and adapting to climate change and sea-level rise and reducing wastewater overflows and infiltration.

We submit that the Council must take a holistic, sustainable Three Waters approach in line with its Integrated Water Strategy and address all these issues with a set of affordable staged steps:

1. Fix the broken pipe network. It is absurd to build a hugely expensive new wastewater system to cope with the existing flows when more than 60% of the wastewater being processed is not sewage, but storm and ground water that has infiltrated the leaking pipe network. The pipes are compromised and the level of infiltration is well beyond the Water NZ thresholds for excessive I&I². Where infiltration occurs, raw sewage can also leak out. Money will be saved down the track because the size of the problem will be drastically reduced. The system will be much more climate resilient because storm effects on the network and treatment plant will be much less and the frequency of raw sewage overflows and leakage greatly reduced as a result.

² Water New Zealand I&I 2015, p13

2. Rethink and look for a reuse solution while this I&I work is being done (along with initiatives to reduce water consumption), and design the eventual solution based on *actual* sewage flows.
3. Plan to treat the wastewater to a sufficiently high standard that all forms of re-use become possible, including managed aquifer recharge, stream replenishment, non-potable re-use inside and outside the home and, eventually, potable re-use.
4. Build the solution to facilitate re-use in a cost effective manner, starting with municipal indoor and outdoor purple pipe use, and potentially adding aquifer re-charge and replenishing Akaroa's streams so the water take in summer has a lower impact on stream health.
5. Aim to introduce further water re-use over time, as the regulatory framework in New Zealand enables this. Add purple pipe re-use to homes where practical and when roads are being dug up for other reasons, initially for garden watering. Aim to ultimately be able to return the recycled water to the water supply reservoir for supplementing the water take from Akaroa's streams and to the potable supply network.
6. Collaborate with Ngāi Tahu to reach consensus on how to make both re-use and the disposal of excess flows culturally acceptable via a wetland or other approach (such as MAR).
7. Achieve carbon neutrality by planting pond site 10 or other Council land, such as Misty Peaks.
8. Set up a staged program to fund delivery in the 2021 LTP, starting with network upgrades to fix the pipes, followed by a correctly sized new Treatment Plant.
9. The staged and funding program provides the framework to support any consent necessary and at the point they are required.
10. Recognise that the Takapuneke consent will need to be extended whichever option is chosen; until at least 2024 for the Harbour Outfall or 2028 for any of the land-based options.

The Akaroa wastewater project requires a large investment at a time of great economic and climate change uncertainty.

Council can elect to borrow to invest in one of the presented options, leaving the issues of leaking pipes, climate resilience and water shortages unresolved and a high level of debt for future repayment.

Alternatively, it can choose to look at the Three Waters in an integrated way and design and invest in a solution built for the future and in conjunction with new government initiatives. We strongly urge it to choose the latter course.