
ORDINARY MEETING
OF
PŪRORO MAHEREHERE | ANNUAL PLAN/LONG-TERM PLAN
COMMITTEE
AGENDA

Time: 1:30pm
Date: Tuesday, 8 February 2022
Venue: Zoom

MEMBERSHIP

Mayor Foster (Deputy Chair)
Deputy Mayor Free
Councillor Calvert
Councillor Condie
Councillor Day
Councillor Fitzsimons
Councillor Foon
Liz Kelly
Councillor Matthews (Chair)
Councillor O'Neill
Councillor Pannett
Councillor Paul
Councillor Rush
Councillor Woolf
Councillor Young

Have your say!

You can make a short presentation to the Councillors at this meeting. Please let us know by noon the working day before the meeting. You can do this either by phoning 04-803-8334, emailing public.participation@wcc.govt.nz or writing to Democracy Services, Wellington City Council, PO Box 2199, Wellington, giving your name, phone number, and the issue you would like to talk about. All Council and committee meetings are livestreamed on our YouTube page. This includes any public participation at the meeting.

AREA OF FOCUS

The Long-term Plan and Annual Plan give effect to the strategic direction and outcomes set by the Strategy and Policy Committee by setting levels of service and budget.

The Committee is responsible for overseeing the development of the draft Annual Plan and Long-term Plan for consultation, determining the scope and approach of any consultation and engagement required, and recommending the final Long-term Plan and Annual Plans to the Council.

To read the full delegations of this committee, please visit wellington.govt.nz/meetings.

Quorum: 9 members

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1. Meeting Conduct

1.1 Karakia

The Chairperson will open the meeting with a karakia.

Whakataka te hau ki te uru, Whakataka te hau ki te tonga. Kia mākinakina ki uta, Kia mātaratara ki tai. E hī ake ana te atākura. He tio, he huka, he hauhū. Tihei Mauri Ora!	Cease oh winds of the west and of the south Let the bracing breezes flow, over the land and the sea. Let the red-tipped dawn come with a sharpened edge, a touch of frost, a promise of a glorious day
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At the appropriate time, the following karakia will be read to close the meeting.

Unuhia, unuhia, unuhia ki te uru tapu nui Kia wātea, kia māmā, te ngākau, te tinana, te wairua I te ara takatū Koia rā e Rongo, whakairia ake ki runga Kia wātea, kia wātea Āe rā, kua wātea!	Draw on, draw on Draw on the supreme sacredness To clear, to free the heart, the body and the spirit of mankind Oh Rongo, above (symbol of peace) Let this all be done in unity
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1.2 Apologies

The Chairperson invites notice from members of apologies, including apologies for lateness and early departure from the meeting, where leave of absence has not previously been granted.

1.3 Conflict of Interest Declarations

Members are reminded of the need to be vigilant to stand aside from decision making when a conflict arises between their role as a member and any private or other external interest they might have.

1.4 Confirmation of Minutes

The minutes of the meeting held on 18 November 2021 will be put to the Pūroro Maherehere | Annual Plan/Long-Term Plan Committee for confirmation.

1.5 Items not on the Agenda

The Chairperson will give notice of items not on the agenda as follows.

Matters Requiring Urgent Attention as Determined by Resolution of the Pūroro Maherehere | Annual Plan/Long-Term Plan Committee.

The Chairperson shall state to the meeting:

-
1. The reason why the item is not on the agenda; and
 2. The reason why discussion of the item cannot be delayed until a subsequent meeting.

The item may be allowed onto the agenda by resolution of the Pūroro Maherehere | Annual Plan/Long-Term Plan Committee.

Minor Matters relating to the General Business of the Pūroro Maherehere | Annual Plan/Long-Term Plan Committee.

The Chairperson shall state to the meeting that the item will be discussed, but no resolution, decision, or recommendation may be made in respect of the item except to refer it to a subsequent meeting of the Pūroro Maherehere | Annual Plan/Long-Term Plan Committee for further discussion.

1.6 Public Participation

A maximum of 60 minutes is set aside for public participation at the commencement of any meeting of the Council or committee that is open to the public. Under Standing Order 31.2 a written, oral or electronic application to address the meeting setting forth the subject, is required to be lodged with the Chief Executive by 12.00 noon of the working day prior to the meeting concerned, and subsequently approved by the Chairperson.

Requests for public participation can be sent by email to public.participation@wcc.govt.nz, by post to Democracy Services, Wellington City Council, PO Box 2199, Wellington, or by phone at 04 803 8334, giving the requester's name, phone number and the issue to be raised.

2. General Business

2022/23 ANNUAL PLAN DRAFT PLAN AND BUDGET

Kōrero taunaki

Summary of considerations

Purpose

1. This report to Pūroro Maherehere | Annual Plan/Long-Term Plan Committee is to provide an update on the Annual Plan budget, outline the upcoming process including how decision making on outstanding issues will coordinate into the Annual Plan deliberations on 8 March.
2. This paper also seeks direction on a number of issues, including revenue and financing non-compliance and previous committee resolutions in order to inform the final draft 2022/23 budget for Committee deliberations on 8 March.

Strategic alignment with community wellbeing outcomes and priority areas

Aligns with the following strategies and priority areas:

- | | |
|--|---|
| Strategic alignment with priority objective areas from Long-term Plan 2021–2031 | <ul style="list-style-type: none"><input checked="" type="checkbox"/> Sustainable, natural eco city<input checked="" type="checkbox"/> People friendly, compact, safe and accessible capital city<input checked="" type="checkbox"/> Innovative, inclusive and creative city<input checked="" type="checkbox"/> Dynamic and sustainable economy
<input checked="" type="checkbox"/> Functioning, resilient and reliable three waters infrastructure<input checked="" type="checkbox"/> Affordable, resilient and safe place to live<input checked="" type="checkbox"/> Safe, resilient and reliable core transport infrastructure network<input checked="" type="checkbox"/> Fit-for-purpose community, creative and cultural spaces<input checked="" type="checkbox"/> Accelerating zero-carbon and waste-free transition<input checked="" type="checkbox"/> Strong partnerships with mana whenua |
|--|---|

Relevant Previous decisions

The body of this report notes the relevant previous committee resolutions to the development of the 2022/23 Annual Plan. It either provides recommendations for those resolutions or noting when those recommendations will be presented as part of the Annual Plan process.

Significance

The decision is rated high significance in accordance with schedule 1 of the Council's Significance and Engagement Policy. This report covers updates on progress on proposed amendments to the 2021-31 LTP of high significance and requiring statutory consultation

Financial considerations

Nil Budgetary provision in Annual Plan / Long-term Plan Unbudgeted \$X

3. This report outlines the draft budget for the 2022/23 financial year

Risk

Low Medium High Extreme

Authors	Geoffrey Coe, Principal Advisor Corporate Planning Lloyd Jowsey, Team Leader, Planning and Reporting Baz Kaufman, Manager Strategy and Research Richard Marshall, Manager Financial Accounting & Transactional Services Elizabeth Steel, Funding Manager Raina Kereama, Team Leader, Financial Planning
Authoriser	Stephen McArthur, Chief Strategy & Governance Officer Sara Hay, Chief Financial Officer

Taunakitanga

Officers' Recommendations

Officers recommend the following motion

That Pūroro Maherehere | Annual Plan/Long-Term Plan Committee:

- 1) Receive the information
- 2) Note the draft 2022/23 financial position, reflecting the recently rescheduled capital programme, of a 9.1% rates rise, \$1.3bn forecast level of debt, and \$421m capital programme
- 3) Note that the draft rates position may change further as other budget decisions are included and budget inputs, such as inflation assumptions, are confirmed closer to the beginning of the 2022/23 financial year.
- 4) Note the heightened uncertainty facing planning for 2022/23 year as a result of the current spread of the COVID-19 Omicron variant in the community
- 5) Agree to include an additional \$500,000 operating costs in the 2022/23 Annual Plan for committee deliberations in March relating to a range of discounts on fees and rates for owners of earthquake prone buildings.
- 6) Agree the preferred approach on the resolution as to whether to include additional budget for Mākara resilience works is to undertake further detailed design work in 2022/23, in order for the works and funding options to be considered as part of the 2023/24 Annual Plan.
- 7) Note other outstanding committee resolutions related to the 2022/23 Annual Plan will be progressed through other upcoming committee meetings and incorporated into the draft budget for deliberations on 8 March
- 8) Agree in principal R&F non-compliance of Activity 7.1.4 Passenger transport network, and 5.2.5 Housing where compliance differs from LTP
- 9) Agree in principal non-compliance where other activities are non-compliant but within variance thresholds or in line with the position accepted during LTP.
- 10) Agree the proposed changes to fees and user charges, noting the balance of fees and charges would change as per year two of the 2021-31 LTP
- 11) Note that the full draft 2022/23 budget and consultation document will be presented to the 8 March Pūroro Maherehere | Annual Plan/Long-Term Plan committee meeting for deliberation.

Whakarāpopoto

Executive Summary

4. This report is to provide an update on the Annual Plan budget, outline the upcoming process including how decision making on outstanding issues will coordinate into the Annual Plan deliberations on 8 March.

5. This paper also seeks direction on a number of issues, including revenue and financing non-compliance and previous committee resolutions in order to inform the final draft 2022/23 budget for Committee deliberations on 8 March.

Takenga mai

Background

Process

6. 2022/23 is the second year of the recently adopted Long-Term Plan. As such, the majority of content of the plan for the year has already been set through the long-term plan process. In addition, the Pūroro Tahua | Finance and Performance Committee approved a capital expenditure rescheduling in November 2021 as a result of advice about construction market pressures, and this has largely set the capital programme for the 2022/23 year.
7. The Annual Plan process is therefore focused on reviewing and approving any other variations from the planned programme of work and budget from the second year of the Long-Term Plan.
8. These potential changes are a result of both changes in Council's operating environment (resulting in cost pressures) and also from other Council and Committee decision making.
9. A number of Council and Committee resolutions have been passed over the previous seven months which are relevant to the Annual Plan 2022/23. These mainly relate to the consideration of additions or changes to the LTP budget, with resolutions requiring that they be considered through the 2022/23 Annual Plan process.

Long-term Plan amendments

10. This year we are also progressing two potential Long-Term Plan amendment issues alongside our Annual Plan. These are in relation to the future of City Housing and residual waste disposal. These amendments require a formal consultation process through the Local Government Act 2002 including scrutiny of proposals through external audit. The amendment process results in a compressed timeline where Annual Plan decisions are required to be taken early enough to allow time for robust consultation and audit on the LTP amendment issues.
11. The consultation on the Annual Plan and amendments will likely be heavily focused on these amendment issues.

Timeline

12. The timeline for the Annual Plan is outlined in the table below

Item	Date	
<i>Pūroro Rangaranga Social, Cultural and Economic Committee</i> City Housing options	7 October	Complete
<i>Pūroro Tahua Finance and Performance Committee</i> Construction market/capital rescheduling report	18 November	Complete
<i>AP/LTP Workshop – early view of draft budget and plan</i>	14 December	Complete
<i>AP/LTP Workshop – workshop review on cost pressures and key issues for decision in 8 February Committee</i>	1 February	Complete

Item	Date	
<i>Pūroro Maherehere AP/LTP Committee</i> Review of draft budget and direction on key issues	8 February	
<i>Pūroro Maherehere AP/LTP Committee</i> Deliberations on final draft 2022/23 Annual Plan and budget and LTP amendment options	8 March	
External audit of consultation document	9-22 March	
<i>Pūroro Maherehere AP/LTP Committee</i> Adoption of Consultation Document	29 March	
Consultation	31 April-2 May	
Hearings/Forum	May	
<i>Pūroro Maherehere AP/LTP Committee</i> Report back on consultation and deliberation on final draft 2022/23 Annual Plan	25 May	
<i>Council</i> Adoption of Annual Plan and LTP amendments	30 June	

Kōrerorero

Discussion

13. 2022/23 is Year 2 from the recently adopted LTP. The table below outlines key features of the current planned programme of work for the year as agreed through the 2021-31 Long-Term Plan and November capital rescheduling. Some further information on this table can be found in Attachment 1.
14. This programme of work is above and beyond the ongoing delivery of core Council services. It is an ambitious programme of work totalling over \$421m capex, the largest level of capital expenditure Council will have delivered and a 23% increase on the 2021/22 budget.

Starting	Continuing	Finishing
<ul style="list-style-type: none"> • Begonia House Precinct • Kerbside Waste Servicing Options • Bond Store upgrade • Venues upgrades • Freyberg Pool • Skate Parks • Community sports asset renewals • Wadestown Community Centre • City Housing Upgrade Phase 2 • Paneke Pōneke – Bike Network • LGWM early delivery 	<ul style="list-style-type: none"> • Digitisation of City Archives • Ōtari walkway upgrades • Development of Huetepara Park in Lyall Bay - Phase 1 • Te Atakura First to Zero programme • Construction of Omāroro Reservoir • Renewal and upgrade investments in Three waters • Sludge Minimisation Project • Te Matapihi Central Library development • City Housing - Healthy Homes upgrade programme • City Housing – establishment of Community Housing Provider (pending Council decision) 	<ul style="list-style-type: none"> • Completion of Tākina Wellington Convention and Exhibition Centre • Completion of central city Youth Hub • Variety of Public Space upgrades • Bike network transitional projects • Ngaio Gorge slope stabilisation works

Starting	Continuing	Finishing
	making) • Town Hall remediation work • Pōneke Promise works • Sustainable Food Network • Update of District Plan • Delivery of Te Kāinga programme- affordable rental apartments • Paneke Pōneke – Bike Network • Variety of Public Space upgrades	

Changes since the Long-Term Plan

15. There have been a number of changes since the LTP was adopted that affect 2022/23. These have been incorporated into the draft rates and debt positions in this report. The changes are a mix of revenue inflationary pressures, market constraints, and NZTA and Parking forecast revenue updates.
16. Changes also include some cost reductions and improved revenue projections. These relate to reduction in costs resulting from capital programme underspend and rescheduling and some NZTA revenue.
17. It should be noted that the cost pressures included in the draft budget are only significant pressures that have not been able to be ‘absorbed’ within Group budgets. Minor cost pressures have already been managed wherever possible through the identification of offsetting savings or efficiencies within Group budgets.

Alignment with Financial Strategy / 2022/23 Rates and debt position

18. The rates position from these changes is currently a 9.1% increase (before growth). This is below the forecast 9.7% increase in year two of the 2021-31 Long-Term Plan and within the limits set through the LTP.
19. Debt is projected to be \$1.3 billion with a debt to revenue ratio of 234% both as forecast in year two if the 2021-31 Long Term Plan. While the debt to revenue ratio breaches the limit of 225% a temporary breach was approved through the LTP.
20. It should be noted that the 9.1% rates increase is the forecast from the current version of the 2022/23 budget. This figure could increase for final Annual Plan deliberations in May as any 2022/23 impacts of the current COVID-19 outbreak are understood and other financial assumptions (including inflation) are updated in future versions of the budget.

Section on heightened uncertainty facing 2022/23- Omicron

21. Given the current COVID-19 outbreak there are heightened risks to the delivery of services and our programme of work going into 2022/23 and service and market disruption is probable in this environment. These disruptions will be to events and services, reduced patronage at facilities, and increased levels of absenteeism.
22. Disruption will carry both performance and financial risk. It is likely that red alert level settings will have an impact on the final months of 2021/22 including from reduced patronage at facilities affecting non-rates revenue, postponement or cancellation of city events, and general pressure on households and businesses.
23. Council may be called upon to provide support to event providers and other groups and may be required to manage shortfalls in expected non-rates revenue. Depending on

how these pressures are managed, then there may be ongoing financial impacts into the 2022/23 financial year (for example if Council choose to debt fund some of these pressures as has been the case in previous years).

24. It is uncertain what degree these impacts will continue on into the 2022/23 financial year, but there may be ongoing direct financial impacts. Disruption to services is also possible to impact in 2022/23 given the risk of increased absenteeism of Council and CCO staff.
25. Given the high level of uncertainty of the impact and duration of the current COVID-19 outbreak, officers have not currently forecast this into performance targets or revenue projections for the 2022/23 Annual Plan. It will need to be managed it as a risk and monitored closely over the remainder of 2021/22, and the final 2022/23 budget and plan presented for Council deliberations in May 2022 will likely have more certainty on these affects.

Cost pressures/changes in budget

26. The significant changes are outlined in the table below. The overall financial impact of these changes is noted in the following section on rates and debt impacts.
27. There are limited options to further mitigate the size of the rates increase for 2022/23. The increased pressures outlined below are largely non-discretionary and have been offset by a reduction in depreciation due to capital programme underspend and rescheduling. Increasing the internal savings to offset any further pressures on operational costs is not recommended as it may not be achievable given there are already currently \$15m of internal cost savings expected to be delivered in the 2022/23 budget from efficiencies in Council services.

Change	2022/23 impact
Cost pressures	
a) Competitive labour market putting pressure on remuneration for appointments to roles. Driven by constrained markets (labour market, supplier market) in the context of a growing programme of work.	\$3m - \$4m
b) Unexpected events – the ongoing impacts of COVID-19, e.g. paying back short-term debt	\$0.4m
c) Interest costs – market movements higher than budgeted interest rates.	\$3.3m
d) Detailed Seismic Assessments – a relatively minor cost pressure in 2022/23, but outcome of assessments may lead to larger future financial impact.	\$0.3m
e) Community Centre upgrades – inflationary pressure on budgets that have been carry forward from previous years and increased accessibility requirements. (capex pressure- no 22/23 rates impact)	\$2.4m capex
Parking revenue pressures	
f) Loss of spaces for LGWM and Cycleways Network (Newtown & Thorndon to the city)	\$1.5m
g) Placement of planned static cameras reviewed in the	\$1m

context of LGWM and other expected city shaping changes (e.g. Golden Mile)	
h) Pressure on achieving forecasted inflated revenue	\$0.9m
i) Budget error – duplication of Waterfront/Community Facilities parking	\$1.4m
j) Waterfront parking changed from all-day parking to P240 & closure of Frank Kitts Park carpark	\$0.7m
NZTA revenue changes	
k) Reduced NZTA subsidy on Capital Projects (cycleways)- a lower level of subsidy than expected was confirmed following adoption of the 2021-31 LTP.	\$4m (debt impact rather than rates)
l) Reduced NZTA subsidy on Operational costs – Cable Car strengthening	\$1.7m
m) Increased NZTA subsidy on Operational costs – higher level of subsidy than expected was confirmed following adoption of the 2021-31 LTP.	\$1.3m
Reduced costs	
n) Depreciation – underspend in Capital expenditure for 2020/21 and forecasted 2021/22	\$10.5m

Issues for decision making

28. The remainder of this report works through key further proposed changes to the 2022/23 budget as a result of previous Council or Committee resolutions or in relation to a review of compliance of the draft budget against Council Revenue and Finance policy.
29. Recommendations ask you to approve the approach to some of these issues within the draft budget to be prepared for Pūroro Maherehere | AP/LTP Committee deliberations on 8 March. For the remaining issues this report notes that separate reports that will (as the time of writing) shortly be presented to relevant Committees for decision making.

EQ prone buildings additional support

30. As part of the update on Earthquake prone buildings and presentation of the results of a targeted engagement survey with earthquake-prone building owners, the 9 December Pūroro Waihangā | Infrastructure Committee meeting resolved to:
- a. *Agree to investigate some options to provide additional support to owners of earthquake prone buildings and bring back advice in time for Annual Plan deliberations in February 2022.*

Current support

31. The Council currently offers a range of support options for building owners managing potentially earthquake-prone or earthquake-prone buildings. The current support includes:
- a) Heritage Resilience Regeneration Fund – a grant to assist with strengthening of heritage buildings
 - b) 10% refund on Building Consent Fee – cap 5k

- c) Rates rebates when the building is no longer EPB (strengthened or demolished) rebate between 3 – 10 years depending on heritage status.
 - d) Rate rebate when the building is empty during strengthening.
32. As part of the survey, case managers asked about the owners' knowledge of the support currently available. The Council has work to do to raise awareness of current offerings, especially the current rates and building consent rebates.
- a) Building consent fee refund (36 owners aware and 137 unaware)
 - b) Rates rebate when the building is no longer earthquake-prone (46 aware and 126 unaware)
 - c) Rates rebate if a building is empty during strengthening work (50 aware, 121 unaware)

Additional support

33. As part of the survey, building owners were asked how useful a range of potential future incentives and support would be. Discounts on resource consent fees, construction parking and corridor access requests were rated as the most useful and are the basis for recommending the additional support per applicant as detailed below.
- a) 50% refund on Resource Consent Fee – cap 5k
 - b) 50% refund/reduction on Road Usage Licence Application (RUL) – cap 5k
 - c) Fee waived for Corridor Access Request (CAR) \$100
 - d) Increase current building consent fee refund from 10% to 50% - maintain a cap of 5k
34. The average number of strengthened or demolished buildings in the last four years is 70.

Support type	Volume and support	Total
Resource Consent Fee	70 x \$5k	\$350,000
RUL	70 x \$5k	\$350,000
CAR	70 x \$100	\$7,000
Addition support total		\$707,000 maximum

35. Given the lead in times to progressing this type of work, uptake of the support may take some time to build. It is therefore recommended to budget for 70% of the potential maximum level of support in the 2022/23 year (Totalling \$500,000) with the full \$707,000 budgeted in subsequent years. This additional support would be funded through an increase in rates. Levels of uptake can be monitored overtime and appropriate levels of funding provisioned at the next Annual Plan.

Mākara beach

36. In response to feedback on the 2021/31 Long-Term Plan consultation from the Mākara community the 27 May AP/LTP Committee meeting resolved to:
- a) *Agree that officers will provide advice to enable Councillors to consider including \$585k capex and \$20k opex in the 2022/23 Annual Plan for the construction and maintenance of a bund and associated civil works.*
 - b) *Note that the advice will incorporate an assessment of alternative funding sources.*
37. Officers have reviewed the work to date and assessed different funding options used for similar projects nationally. Officers however recommend that additional work is required on the detail design of works in order to provide more certainty on the likely costs. Currently there is too great a level of uncertainty of costs to be able to include an accurate figure in the 2022/23 budget. The amounts in the 27 May 2021 committee resolution are based on 2018 estimations of costs. Actual costs are highly dependent

on the final detailed design of the bund, with particular sensitivity to the amount of ecologically suitable gravel required in the final design and the ability to source it.

38. Officers have investigated potential funding sources for the project. These have included those used in other local authorities for similar projects. Sources range from community contribution through targeted rates, establishing Contributory Funds for climate change adaptation, as well as central government and private sector grant funds or lending schemes. However, they are either unsuitable or would require further work to progress alternative funding arrangements practically, including a higher certainty of costs than is currently available. Progressing meaningful consultation with the community on shared contribution to the costs of the works and any potential subsequent establishment of targeted rating mechanisms would require more time and a relatively high degree of certainty about levels of community contribution.
39. In order to achieve increased certainty on project costs, additional work to further understand the feasibility of the work would include:
 - a) Engineering assessment of the design to ensure the renourishment is effective in reducing risks, including identifying an ecologically suitable source of gravel for the renourishment, quantifying the gravel required, and other changes to the beach environment (e.g. potential loss of car parking and access to the boat ramp);
 - b) Ecological assessment to ensure the works would not cause harm to the ecologically sensitive environment;
 - c) Detailed costings, especially to identify the quantity required and a source of the gravel that is ecologically suitable/affordable;
 - d) Consenting will require more detailed design and assessments - the timeframes and costs to the project given the complexity of working in the coastal environment in close proximity to sites of significance including the Mākara Foreshore and Scenic Reserve, Ōwhariu Pā, and Mākara estuary.
40. It is likely that some allowance for this detailed design work will be necessary in 2022/23. An estimate of the costs for this design work is not yet known but can be included in time for final deliberations and adoption of the 2022/23 Annual Plan.

Frank Kitts Park

41. As part of final deliberations on the 2021-31 Long-Term Plan, the 27 May AP/LTP Committee meeting resolved to:
 - a. Agree to the following:
 - i. *a) Reinstate the 6.5 million for the Frank Kitts Garden park development, known as the Garden of Beneficence to 2024/25 as was originally in the plan;*
 - ii. *b) That officers work with the Chinese Garden Society to, by the end of financial year 2022, explore the feasibility of early installation of the gateway infrastructure/ Pai Lau to inform 2022/23 annual plan; and*
 - iii. *c) That officers work on a future plan for Frank Kitts Park that integrates the aspirations of The Wellington Chinese Garden Society and the Fale Malae Trust.*
42. This resolution has been superseded by the September Planning and Environment resolutions on the Frank Kitts Car Park and Fale Malae given the commitment to demolish the car park and subsequently develop a development plan for Frank Kitts Park. Officers will be providing an update memo to councillors mid-march once the final geotechnical report has been received.

Skate Parks

43. In response to feedback on the 2021/31 Long-Term Plan consultation from the skate community the 27 May AP/LTP Committee meeting resolved for:
 - a. *Officers to come back to report on costs and feasibility of a destination skate park within the 2022/23 Annual Plan*
44. Officers are currently working on this advice and will come back to the Pūroro Rangaranga | Social, Cultural and Economic committee in April prior to being able to be included within the Annual Plan as part of final deliberations of this committee in May.

Khandallah pool

45. As part of final deliberations on the 2021-31 Long-Term Plan, the 27 May AP/LTP Committee meeting resolved to:
 - a. *Agree that officers continue work on options for Khandallah Summer pool and report back to Councillors by October 2021 with the final options to be included in the 2022/23 Annual Plan.*
46. There is a separate report on resolution going to the 3 February Pūroro Rangaranga | Social, Cultural and Economic committee. Decisions taken at that meeting will be included within the final draft budget for Committee deliberations on 8 March

Notice of Motion on city housing

47. In reviewing the notice of motion on city housing, the 2 December Pūroro Rangaranga | Social, Cultural and Economic Committee resolved to:
 - a. *Agree that City Housing investigates the following possible interim steps:*
 - iv. a. *Amend the criteria for the Affordable Rent Limit Subsidy (ARL) to ensure all eligible tenants benefit from it, including by taking into account the impact of the ARL on the level of Accommodation Supplement*
 - v.b. *Rates fund the top up to the ARL fund*
 - vi. d. *Freeze all rent increases for 2022*
 - vii. e. *Translate the Tenants Welcome Pack, Tenant Newsletter and all formal communication regarding tenancy changes of upcoming changes in the operation of City Housing into Te Reo Māori, Arabic, Tamil, Farsi, Mandarin/Cantonese, Spanish, Samoan, Russian, Cambodian and Hindi.*
48. There is a separate report on this notice of motion going to the 3 February Pūroro Rangaranga | Social, Cultural and Economic committee meeting. Decisions taken at that meeting will be included within the final draft budget for Committee deliberations on 8 March

Environmental and accessibility performance fund

49. Through the development of the Te Atakura and review of the Development Contributions Policy, officers have identified an opportunity to support broader Council outcomes through the establishment of a fund to incentivise environmentally sustainable buildings and universal accessibility in Wellington City.
50. This would replace the existing Green Building Remission, which is currently uncapped and available only to commercial and mixed-use developments.
51. Further analysis is currently being undertaken to finalise this proposal. A separate report on this is planned for the 8 March Pūroro Maherehere | AP/LTP committee meeting alongside Annual Plan deliberations. This timing will enable community feedback on any proposal through Annual Plan consultation if required.

Revenue and Financing and fees and user charges

52. Officers have assessed compliance levels of all activities against their respective Revenue and Financing Policies and decisions made through the LTP process. Assessments of the level of compliance for all activities are included as Attachment 2. There are two activities currently breaching compliance testing thresholds.
- a. Temporary non-compliance of Activity 7.1.4 Passenger transport network. This is only a temporary breach relating to funding of the cable car strengthening as a result of assumed NZTA revenue for the work no longer being provided.
 - b. Activity 5.2.5 Housing is currently breaching policy by currently requiring a level of rates funding, however decisions made during the LTP amendment deliberations will dictate the treatment of this current non-compliance
53. Both areas of non-compliance are recommended to be accepted, pending other decisions on City Housing through this Annual Plan process.
54. All other areas of non-compliance are recommended to be accepted as are within variance threshold or were accepted as non-compliance through the LTP. Shown in attachment two

Fees and User charges

55. Officers have also reviewed potential fee and user charge changes. The majority of proposed changes are inflationary to ensure that non-rates revenue keeps pace with budgeted revenue for their activities. The full list of proposed changes is included as Attachment 3.
56. There are a number of fee and user charges being proposed for change greater than forecast in the Long-Term Plan.
- There are 13 recommendations to implement new fees. None of the fee increases will have a material effect on rates but to help recover costs of services.
 - 1 Recommendation in fee reduction to align with legislation
 - The remaining recommendations below are to increase fees where the area has either experienced:
 - increases in operational expense greater than inflation; or
 - needs to increase fees to the same level as other fees which were increased during the LTP (these have been picked up as not included in the LTP deliberations).

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fee 22/23	Reason for fee change recommendation
1.1.3 City Archives	Residential (per request)	\$25-\$125 dependent on number of requests	\$25.00	This is the removal of the discount we have previously been giving for bulk purchases of consent requests from the archives between 5 and 10 requests (full price \$125 regardless of whether you request 5,6,...,10). Each request will now straight line be charged at \$25 each.

**PŪRORO MAHEREHERE | ANNUAL
PLAN/LONG-TERM PLAN COMMITTEE
8 FEBRUARY 2022**

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fee 22/23	Reason for fee change recommendation
	Commercial Building permits and building consents	\$55.00	\$65.00	This fee has not had any inflation applied since 2015 while the operational costs attached inflation year on year. Analysis shows the \$10 price rise is increasing the price on a cost recovery basis in line with fee increase legislation.
2.1.2 Botanical Gardens	Learning Pavilion full day		\$500.00	Add fee for Learning Pavilion full day \$500/day, \$300/1/2 day
	Learning Pavilion 1/2 day		\$300.00	Add fee for Learning Pavilion full day \$500/day, \$300/1/2 day
	Lotions & Potions space Discovery Garden		\$100.00	Add fee Lotions & Potions area bookings \$100/hr
	Begonia House workshop space/hr		\$40.00	New Beg Hse Workshop space \$40/hr community
	Treehouse Groups > 12 Full day	\$500.00	\$600.00	Possible new rate for >12 pax to 600
	Treehouse Seminar Room Half day Groups > 12		\$400.00	1/2 day \$400 >12 pax
	Wellington Gardens Cleaning Fee >50 people	\$0.00	\$100.00	Add fee of \$100 for bookings over 50pax
	Troupe Picnic lawn inc BBQ space hrly rate		\$100.00	Troupe inc BBQ fee \$100/hr
2.1.9 Waterfront Public Space	Outdoor licence fees m2	\$ 75.00	\$ 85.00	Fees to come into line with Wellington Wide Footpath Charges over three years this is year two. Licences expire at different times
5.1.1 Swimming Pools	Thorndon - 1 hour 0 - 25 people	\$ 160.00	\$ 180.00	These fees should have been increased in the LTP but were missed. Increase is in line with other fee increases in the Pools area approved in the LTP
	Thorndon - 1 hour 26 - 50 people	\$ 210.00	\$ 225.00	
	Thorndon - 1 hour 50 - 100 people	\$ 280.00	\$ 300.00	
	Thorndon - 2 hours 0 - 25 people	\$ 220.00	\$ 245.00	
	Thorndon - 2 hours 26 - 50 people	\$ 280.00	\$ 300.00	
	Thorndon - 2 hours 50 - 100	\$ 360.00	\$ 375.00	

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fee 22/23	Reason for fee change recommendation
	people			
5.1.4 Recreation Centres	ASB - Extra Staff	\$ 30.00	\$ 40.00	Look to make consistent - aim to move to \$45 in 23/24 to have all fees consistent
5.1.7 Marinas	Evans Bay Live-Aboard fee	\$ 645.00	\$ 1,200.00	Recommended full price
5.3.1 Burials and Cremations	Arrangement fee	\$ -	\$ 150.00	New fee proposed to cover administrative expenses
5.3.3 Public Health	Dog Euthanisation - up to 20kg	\$ -	\$ 176.00	New fee introduced to recover the cost of euthanisation from dog owners (i.e. dangerous dogs). Currently the Council has been absorbing these costs.
5.3.3 Public Health	Dog Euthanisation - 21 - 40kg	\$ -	\$ 219.00	New fee introduced to recover the cost of euthanisation from dog owners (i.e. dangerous dogs). Currently the Council has been absorbing these costs.
5.3.3 Public Health	Dog Euthanisation - over 40kg	\$ -	\$ 262.00	New fee introduced to recover the cost of euthanisation from dog owners (i.e. dangerous dogs). Currently the Council has been absorbing these costs.
5.3.3 Public Health	Dog Walker Licence	\$ -	\$ 191.50	New fee for licensed dog walkers. The licence requirement comes out of the new Trading and Events in Public Places Policy (TEPP) which comes into effect on 1st July 2022.
5.3.3 Public Health	Dog Walker Renewal	\$ -	\$ 61.00	New for licensed dog walkers (annual renewal). The licence requirement comes out of the new Trading and Events in Public Places Policy (TEPP) which comes into effect on 1st July 2022. Renewals will come into play from 2023/24.
6.2.1 Building Control and Facilitation	Building Warrant of Fitness - Annual Certificate. This is the base charge for 2-10 specified system. Additional charges will apply for the time over 2 hours	\$ 163.50	\$ 209.00	All building compliance and consents fees were increased by 28% during the 21-31 LTP, except for BWoF certificates. Remove reference to additional charges as this is not applicable.

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fee 22/23	Reason for fee change recommendation
	Building Warrant of Fitness - Annual Certificate. This is the base charge for 11+ specified system. Additional charges will apply for the time over 3 hours	\$ 244.75	\$ 313.50	All building compliance and consents fees were increased by 28% during the 21-31 LTP, except for BWoF certificates.
	Certificates of Acceptance - <i>non urgent</i>		Fees Detailed in Attachment 3	<ul style="list-style-type: none"> - There is currently a perverse incentive for individuals to seek a non-urgent CoA to avoid the standard consent process as the fees associated can in some cases be less than going through the appropriate process. To support compliance, we recommend a 100% increase in non-urgent CoA fees to incentivise customers to do the right thing and seek approval for building works before commencing/completing building works. - This will affect a small number of consents as CoA volume is limited. Total CoAs submitted in 2018/19=13, 2019/20=75, 2020/21=30. These numbers include both urgent and non-urgent (system does not easily allow for a reporting breakdown between the two types). - We expect the outcome from this to be fewer non urgent CoAs submitted.
	Building Warrant of Fitness - Annual Certificate. This is the base charge for 1 specified system. Additional charges will apply for the time over 1 hour	\$ 81.75	\$ 104.50	All building compliance and consents fees were increased by 28% during the 21-31LTP, except for BWoF certificates. Remove reference to additional charges as this is not applicable.
6.2.2 Development Control and Facilitation	Town Planning and Building Certificates for the purposes of the Sale and Supply of Act 2012 (fixed fee): - Town planning certificate	Town planning \$500.50 Building certificate \$209 Both certificates \$709.50	Town planning \$276.25 Building certificate \$209 Both certificates \$485.25	As a result of reviewing the charges, it was identified that the charge for the Town Planning Certificate is too high. It is recommended that the Town Planner Certificate fee be reduced and changed to a fixed fee. This is in alignment with the legislative requirement that fees be

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fee 22/23	Reason for fee change recommendation
	- Building certificate - Both			reasonable and aligns with supporting Wellington's hospitality sector.
	Subdivision certificates - Certification for s223, s224(f), s226 - up to 2 hours	\$403.00	\$403.00	Remove "s226" from this fee and introduce new fee for s226 (below) that includes both processing and certification.
	Initial application fee - s226	\$0.00	\$806.00	New s226 processing and certification fee

LTP amendments update

City Housing

57. Options on the future of City Housing are being prepared in line with the resolution of the 7 October Pūroro Rangaranga | Social, Cultural and Economic Committee. Options that are being prepared to be included for consultation include:
- c. Decision 1: Should we resolve City Housing's financial sustainability challenges by increasing rates and borrowing or by establishing a Community Housing Provider?
 - d. Decision 2: If we established a Community Housing Provider, which model should we choose?
 - i. Option 1: Asset-owning, fully independent CHP
 - ii. Option 2: Leasehold CHP with broad responsibilities (preferred option)
 - iii. Option 3: Leasehold CHP with narrow responsibilities
58. The preferred option for consultation will be Option 2- Leasehold CHP with broad responsibilities (noting that feedback on these options is being sought on the public's preferred way forward if the Crown does not provide support or if the Crown Support Option is insufficient to return the portfolio to a financially sustainable footing.
59. The preferred option will have significant impacts on the 2021-31 Long-Term Plan and these impacts, including draft amendments to all LTP documentation) will be presented as part of your 8 March deliberations.
60. It should be noted that, given the time to establish a Community Housing Provider, there will be limited impacts of City Housing options on the 2022/23 budget and Annual Plan.

Residual waste disposal

61. The other issue to be covered through consultation is on residual waste disposal options (relating to the future of the southern landfill). A separate report on this agenda outlines the proposed options for consultation.

62. Consultation on these options is required now in order for decisions to be taken prior to the expiry of the existing resource consent for the southern landfill. The consultation is required to be included within an LTP amendment process as some options would require an amendment to the LTP should they be adopted as they would represent significant changes to services.
63. Approval of the options for residual waste disposal will enable the consultation document to be finalised and preferred option included within the draft budget for your deliberations on 8 March.

Kōwhiringa

Options

64. Not applicable

Whai whakaaro ki ngā whakataunga

Considerations for decision-making

Alignment with Council's strategies and policies

65. The 2022/23 Annual Plan is the second year of the Council's 2021-31 Long Term Plan which outlines the approach to meeting Council strategies and policies.

Engagement and Consultation

66. A full consultation and communication plan will be developed for the 2022/23 Annual Plan and LTP amendments. This plan will be presented to this committee alongside the draft budget and consultation document for deliberations in early March.

Implications for Māori

67. The consultation plan for the 2022/23 Annual Plan and LTP amendments will consider the appropriate way in which to consult with mana whenua on the relevant proposals. The Annual Plan will be the second year of the 2021-31 LTP which commits to a programme of work and funding to increase the level of partnership with mana whenua.

Financial implications

68. The financial implications related to this annual plan are outlined in the body of this report.

Legal considerations

69. There are specific requirements of the Local Government Act 2002 in relation to both the preparation of the Annual Plan and the process for amendments to a Long-Term Plan. These requirements have informed the approach and content of material for this report and have shaped the process and timeline for decision making.

Risks and mitigations

70. Risks related to this annual plan are outlined in the body of this report. They mainly relate to the level of uncertainty in the Council's operating environment heading into

and during the 2022/23 year. These risks will be monitored and be relevant for decision making for final deliberations on the 2022/23 Annual Plan in May and June 2022.

Disability and accessibility impact

71. Accessibility requirements will be considered through the design of the consultation approach to the Annual Plan and LTP amendments. The likely focus on online engagement methods for this consultation will offer both opportunities and challenges for ensuring high accessibility of consultation material.

Climate Change impact and considerations

72. The 2022/23 Annual Plan includes programmes of work to continue Council's implementation of Te Atakura, our First to Zero carbon strategy.

Communications Plan

73. A full consultation and communication plan will be developed for the 2022/23 Annual Plan and LTP amendments. This plan will be presented to this committee alongside the draft budget and consultation document for deliberations in early March.

Health and Safety Impact considered




74. Not applicable

Ngā mahinga e whai ake nei

Next actions

75. The full draft budget and consultation document will be prepared for this committee's deliberations on 8 March 2022.

Attachments

- Attachment 1. Annual Plan projects 
Attachment 2. Revenue and Financing compliance charts 
Attachment 3. Fees and User charges 

What you have planned for 2022/23

What is starting	Begonia House Precinct	Start of planning for investment in Begonia House, Cafe and associated service buildings in order to meet levels of service and visitor expectations. Starts in 2022/23, three year project
	Kerbside Waste Servicing Options	Explore the waste service preferences of residents, including people's willingness to pay for a range of potential servicing options through the Annual Plan consultation process. Outputs from this process will inform further work and consultation necessary to determine the most appropriate level of kerbside waste-related servicing for Wellington City.
	Bond Store upgrade	Work is continuing to identify an appropriate seismic strengthening scheme for this Category I listed heritage building.
	Venues upgrades	Preliminary investigation and planning has begun to identify appropriate schemes to both upgrade and in some cases seismically strengthen some of Council's civic venues.
	Freyberg Pool	We will invest in earthquake strengthening this key recreation asset in this year, including asbestos removal and a roof replacement.
	Skate Parks	Implementation of redevelopment of Tawa skate park
	Community sports asset renewals	Renewal of the Synthetic Turfs at Wakefield Park. Development of the Polo Grounds Community and Sports Centre
	Wadestown Comm. Centre	Decision likely to be made in 2021/22 year on future of the facility after consultation with community. Potential divestment in 2022/23.
	City Housing Upgrade Phase 2	The commencement of the second half of the housing portfolio upgrade, approximately 1,000 units across 30 sites.
	Public Space Upgrades	<i>Island Bay Town Centre</i> - Public space upgrade to the Island Bay Town Centre. Integration with proposed cycleway and safety upgrade works. <i>Berhampore Town Centre</i> - Public space upgrade to the Berhampore Town Centre
What is continuing	Paneke Pōneke – Bike Network Plan	<i>Brooklyn Road cycleway upgrade</i> - Moving from the transitional uphill cycleway to a permanent connection between Karo Drive and the Brooklyn Village <i>Newtown to Island Bay Transitional Cycleway</i> - Working with LGWM to establish a transitional bike route between Newtown and Island Bay
	LGWM early delivery	Planned improvements to Thorndon Quay and Hutt Road, the Golden Mile changes and other pedestrian/public transport improvements are planned to begin in 2022. Decisions to be made on items consulted on in late 2021.
	Digitisation of City Archives	Three year programme to accelerate the digitisation of collection
	Ōtari walkway upgrades	In budget for year 2 of LTP
	Huetepara Park - Phase 1	Commencement of development of improved public space, with toilets and improved visitor experience.
	Omāroro Reservoir	Work continuing on the new reservoir, which is due to be completed in late 2023, followed by 5 years of restoration and maintenance at the site.
	Sludge Minimisation Project	Begin the investment in improving the existing wastewater treatment plant at Moa Point, financed through an SPV.
	Residual Waste Mgmt Disposal Options	Consult on a range of potential residual waste management disposal options through the Annual Plan consultation process.
	Three waters	Second year of increased investment in our water infrastructure - including projects such as upgrades to reduce flooding in Tawa and targeted upgrades in the CBD for growth
	City Housing - Healthy Homes	Continuing the work to bring all of our social housing up to the new Healthy Homes standards.

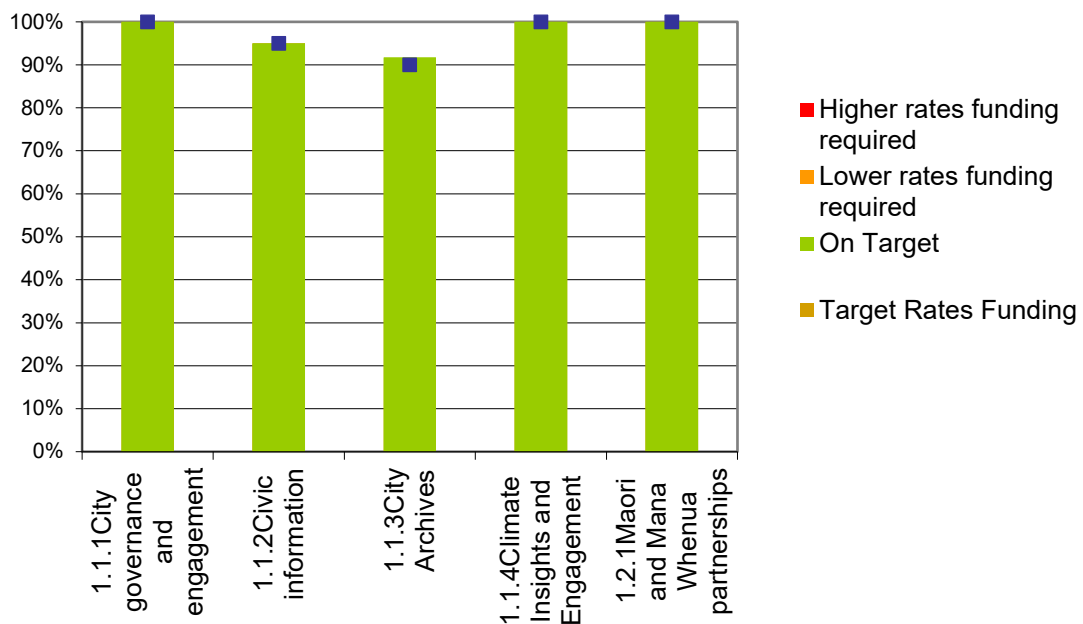
What is continuing	City Housing – sustainability consultation	We will need to put in place the decision Council will make in June 2022 on the future of City Housing. This is being consulted on as part of the Annual Plan process, and will be an amendment to the LTP.
	Pōneke Promise	Continuing the investment in improving safety and reducing harm in the central city. This includes the relocation of the Te Aro Park Toilets, upgrade of Te Aro Park and the surrounding lanes.
	Town Hall	The second to last year of the earthquake strengthening of the Town Hall. Due for completion in 2023/24
	Te Matapihi Central Library	Construction on the high-level remediation option for the building and taking the opportunity to extend levels 3 and 4 to improve the layout. Work due to be completed in early 2026
	Te Atakura programme	Continuing the conversion of the WCC fleet to electric vehicles and the installation of public EV chargers. We are working on the Wellington Regional Climate Change Impact Assessment, which will inform the Regional Adaptation Plan due Dec 2024
	Waste minimisation	Ongoing work is underway to implement the existing Regional Waste Management and Minimisation Plan. Upcoming strategic waste minimisation planning projects in 2022 will include a review of the kerbside waste service system, investigations into the expansion of resource recovery and organic waste processing options, and ongoing community engagement into the development of the next Council Waste Management and Minimisation Action Plan.
	Sustainable Food Network	Continuation of investment in programmes to implement the Sustainable Food Network Action Plan
	District Plan	Consultation on the Proposed District Plan (statutory) will commence in July 2022. The intensification parts of the District Plan will be operative by August 2023, and the rest of the District Plan operative by 2024-2026 (subject to appeals).
	Te Kāinga programme	Continue to deliver on commitment to have 1,000 units delivered or under contract in next five years. This will be year 2 of the programme.
	Paneke Pōneke – Bike Network Plan	Evans Bay Cycleway - Completing the connection through Balaena Bay and the Southern section between Greta Point and Cobham Drive, construction is expected to be completed early 2024
What is finishing	Public Space Upgrades	Swan and Garrett Laneway - Complete upgrade to Garrett St and Swan Lane a portion of Cuba Streets. Integration and partial upgrade of Glover Park Karori Town Centre - Complete upgrade to some of central public space in Karori town centre, focused around the Library, Recreation centre and Community Centre
	Tākina WCEC	A key milestone in 2022/23 (or maybe early 2023/24) will be the opening of Tākina. Construction of the centre is expected to be complete in mid-2023.
	Youth Hub	The Youth Hub will open in 2022, a safe community space for young people to support activities and foster a sense of belonging in the central city.
	Paneke Pōneke – Bike Network Plan	The Parade Upgrade Cycleway - Work will begin early in 2022 on safety improvements on The Parade followed by a connection through the Town Centre mid to late 2022 Initial transitional bike network projects - Delivery of Botanic Garden ki Paekākā to City and Newtown to City transitional projects will be in the adaptation and evaluation stages.
	Public Space Upgrades	Farmers Lane - Tactical urbanism upgrade to Famers Lane (between Lambton Quay and the Terrace) This is private/public partnership with Cornerstone Properties and Council
Ngaio Gorge slip stabilisation	Stage 1 and 2 will be complete, meaning the slip sites are fully repaired. Stage 3 begins in June 2022 - Road upgrades, including new/upgraded stormwater infrastructure, street lighting, provision of parking spaces, and improvements to the footpath and uphill cycle lane. The road will fully reopen in October 2022	

The information above was pulled from projects already committed to in the 2022/23 year in the Long-term Plan or subsequent Council decisions. These are new investments above and beyond the ongoing delivery of Council Services.

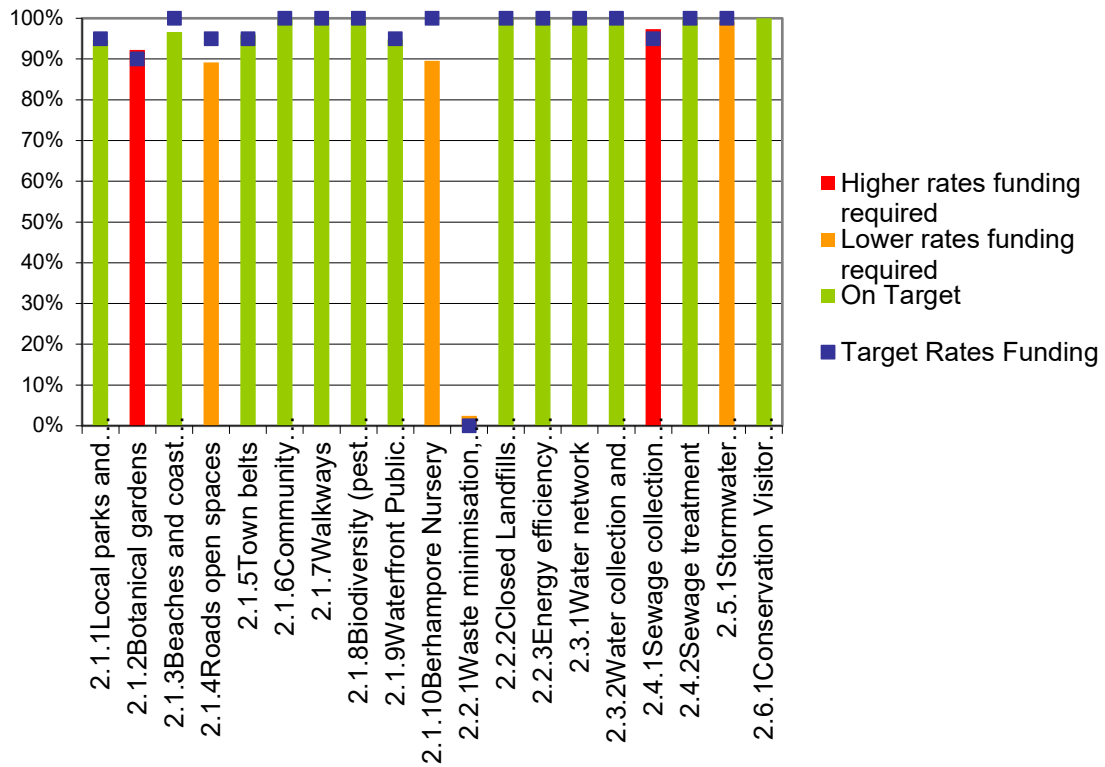
Revenue and Financing – levels of compliance with policy

1. Officers have assessed compliance levels of all activities against their respective Revenue and Financing Polices with a summary of levels of compliance included in the charts below.
2. Some activities are showing non-compliance but have not been highlighted as a compliance issue for this Annual Plan. These activities are where non-compliance was noted in the adoption of the 2021-31 Long-Term Plan and while they continue to be non-compliant their level of compliance has improved since the LTP.

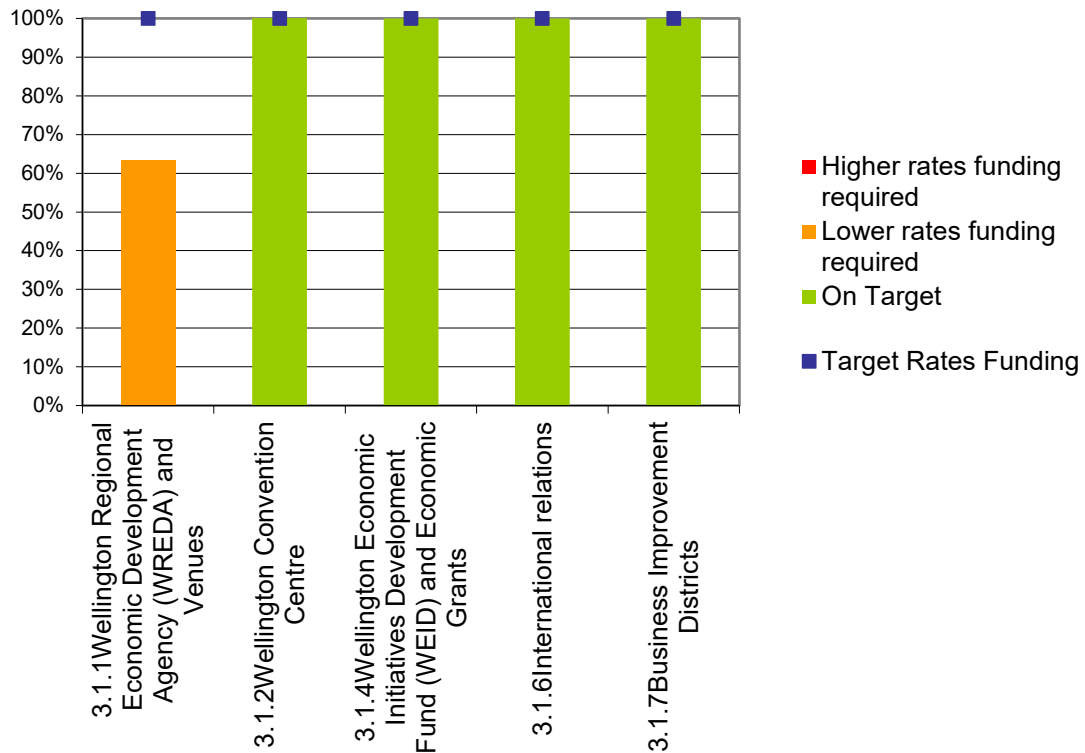
1. Governance - R&F Policy Compliance



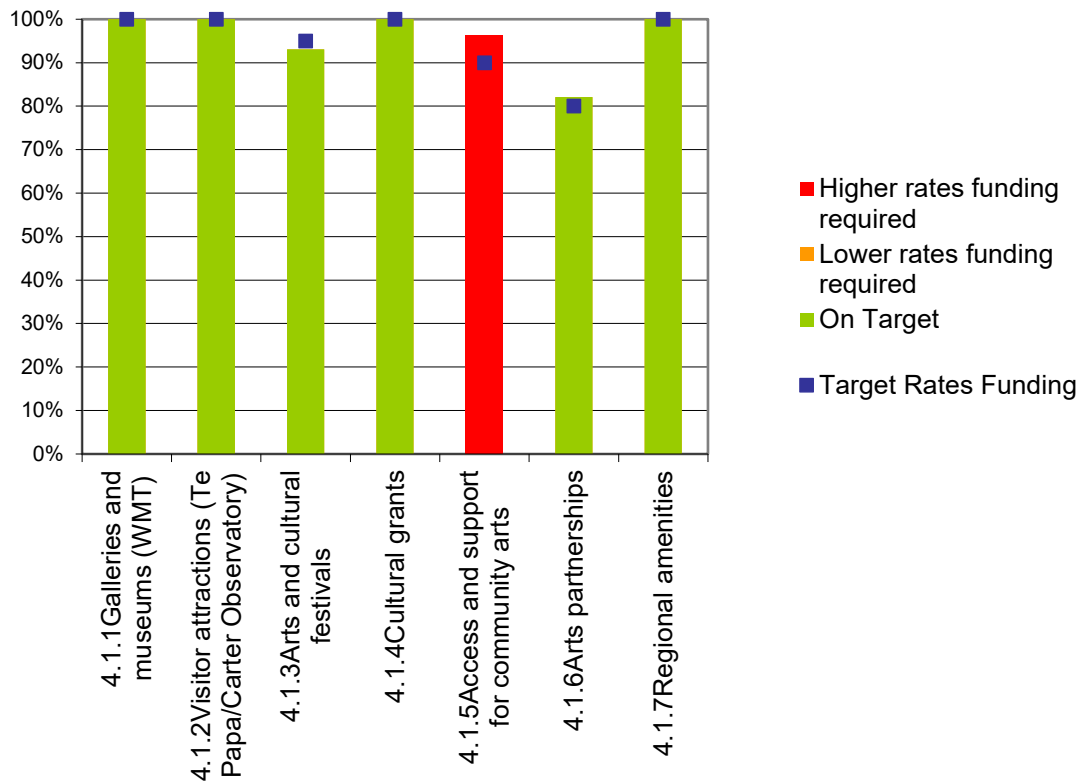
2. Environment - R&F Policy Compliance



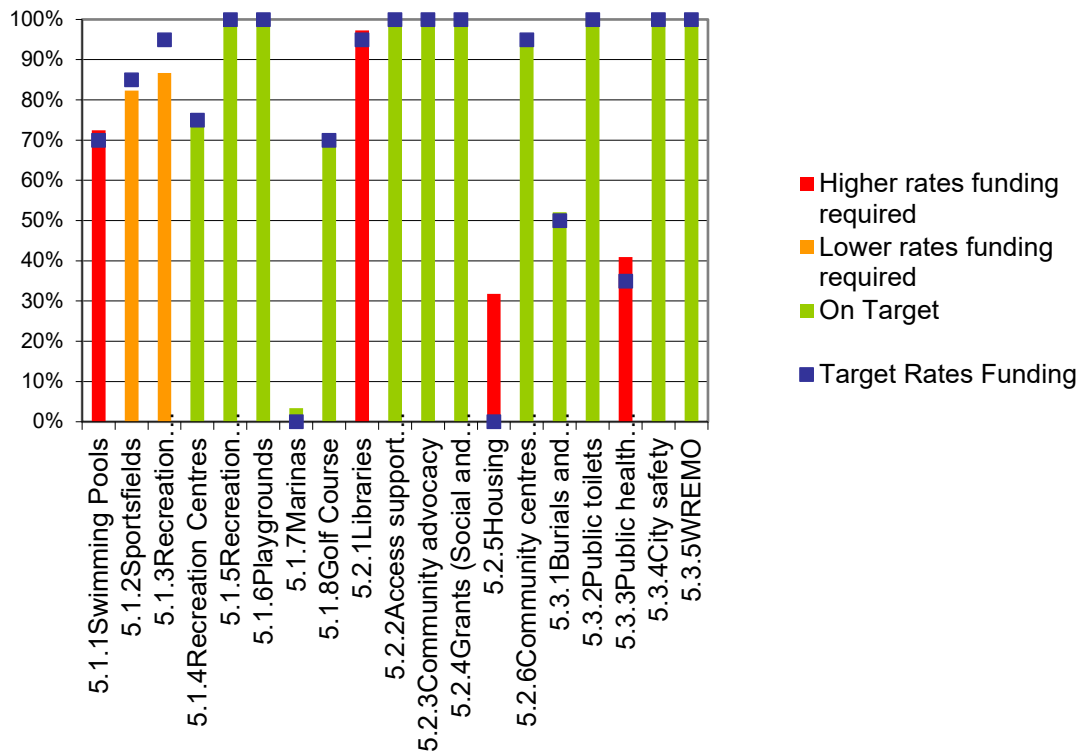
3. Economic Development - R&F Policy Compliance



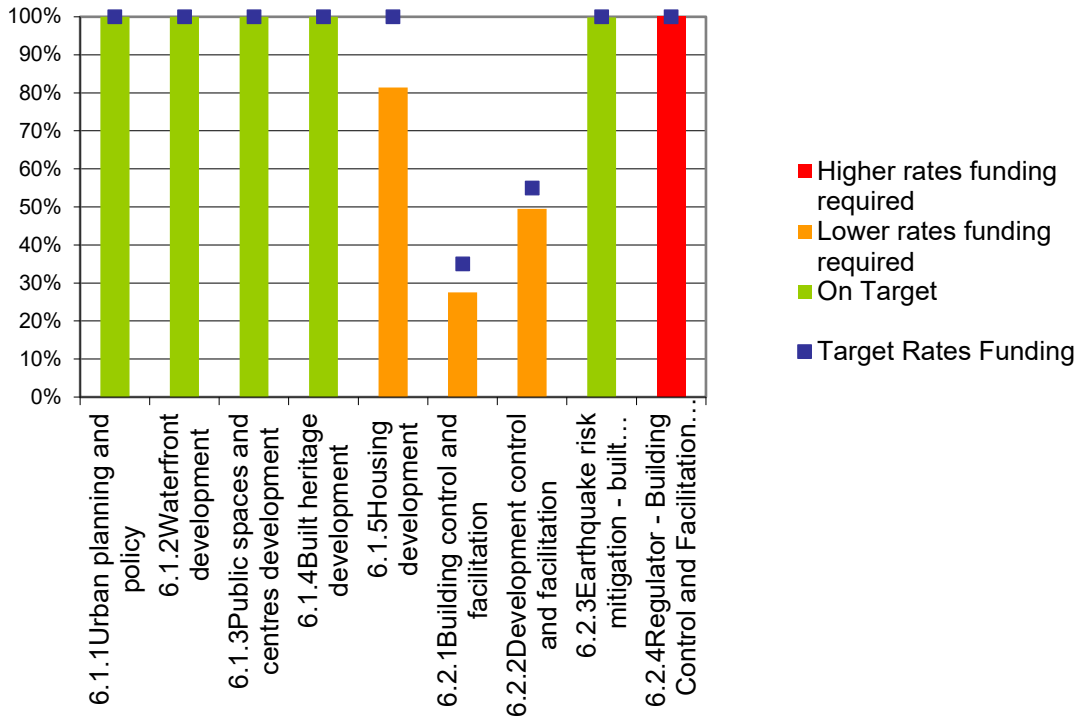
4. Cultural Wellbeing - R&F Policy Compliance



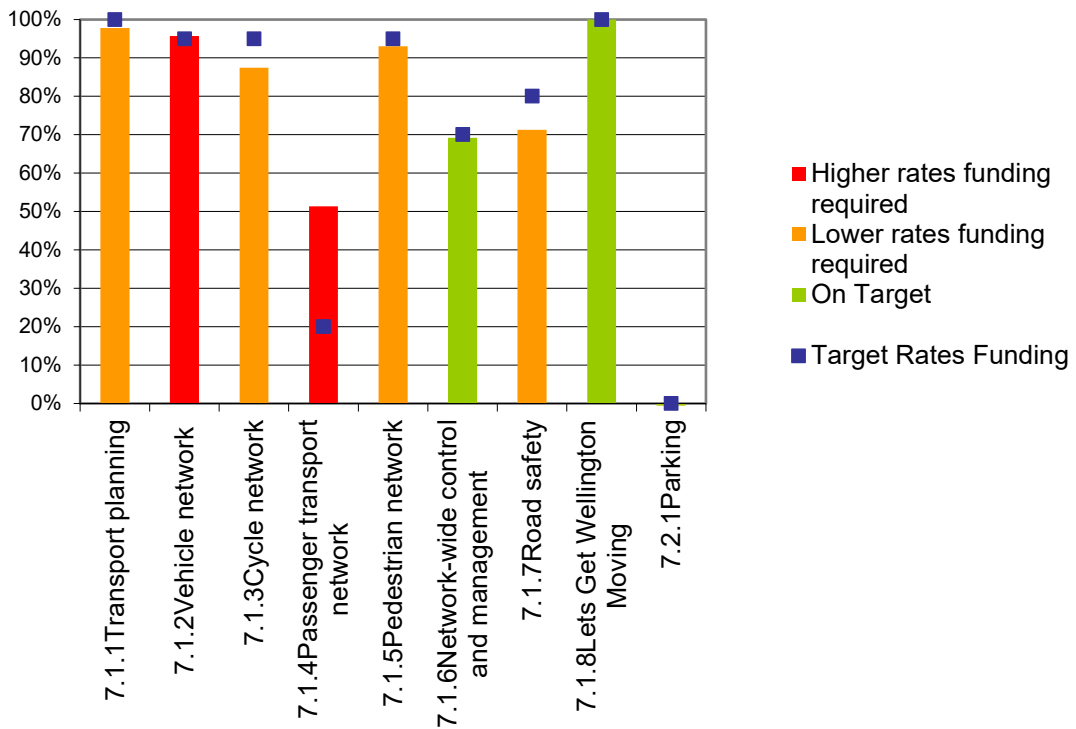
5. Social and Recreation - R&F Policy Compliance



6. Urban Development - R&F Policy Compliance



7. Transport - R&F Policy Compliance



Proposed changes to Fee and User charges

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
1.1.3 City Archives	Residential (per request)	\$25-\$125 dependent on number of requests	\$ 25.00
	Commercial Building permits and building consents	\$ 55.00	\$ 65.00
2.1.2 Botanical Gardens	Discovery Garden child (pre-school)	\$ 4.00	\$ 4.50
	Discovery Garden Child Early Childhood	\$ 4.00	\$ 4.50
	Discovery Garden Child Primary/Intermediate	\$ 5.00	\$ 6.00
	Learning Pavilion full day		\$ 500.00
	Learning Pavilion 1/2 day		\$ 300.00
	Lotions & Potions space Discovery Garden \$100/hr		\$ 100.00
	Begonia House workshop space/hr		\$ 40.00
	Treehouse Groups > 12 Full days	\$ 500.00	\$ 600.00
	Treehouse Seminar Room Half Day Groups > 12		\$ 400.00
	Wellington Gardens Cleaning Fee >50 people	\$ -	\$ 100.00
	Troupe Picnic lawn ink BBQ space holy rate		\$ 100.00
2.1.9 Waterfront Public Spaces	Harbourside Market Monthly Fee Small Unpowered	\$ 175.00	\$ 180.00
	Harbourside Market Monthly Fee Medium Unpowered	\$ 248.00	\$ 255.00
	Harbourside Market Monthly Fee Large Unpowered	\$ 1,100.00	\$ 1,115.00
	Harbourside Market Monthly Fee Small Powered	\$ 210.00	\$ 215.00
	Harbourside Market Monthly Fee Medium Powered	\$ 300.00	\$ 305.00
	Outdoor licence fees m2	\$ 75.00	\$ 85.00
2.2.1 Waste Minimisation	Commercial General Rubbish	\$ 175.38	\$ 196.07
	Domestic General Rubbish	\$ 216.00	\$ 245.50
	Green Waste	\$ 69.00	\$ 80.50
	Sewerage Sludge	\$ 253.00	\$ 276.00
	Special Waste - Asbestos	\$ 253.00	\$ 273.70
	Special Waste - Other	\$ 210.45	\$ 231.15

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Contaminated Soil	\$ 87.00	\$ 94.30
2.4.1 Sewage collection Trade waste	Trade Waste Charges/Sewerage Collection and Disposal Network: Volume - Up to 100m3/day	\$ 0.34	\$ 0.35
	Trade Waste Charges/Sewerage Collection and Disposal Network: Volume - Above 100m3/day but below 7,000m3	\$ 0.15	\$ 0.16
	Trade Waste Charges/Sewerage Collection and Disposal Network: Volume - Above 7,000 m3	\$ 0.98	\$ 1.01
	Trade Waste Charges/Sewerage Collection and Disposal Network: Biochemical Oxygen Demand - Up to 3,150kg/day	\$ 0.34	\$ 0.35
	Trade Waste Charges/Sewerage Collection and Disposal Network: Biochemical Oxygen Deman - Above 3,150kg/day	\$ 0.75	\$ 0.77
	Trade Waste Charges/Sewerage Collection and Disposal Network: Suspended Solids - up to 1,575kg/day	\$ 0.33	\$ 0.34
	Trade Waste Charges/Sewerage Collection and Disposal Network: Suspended Solids - above 1,575kg/day	\$ 0.66	\$ 0.68
5.1.1 Swimming Pools	Adult Spa (Karori Pool)	\$ 5.40	\$ 5.50
	Adult Spa Only (Covid)	\$ 5.40	\$ 5.50
	Adult Swim	\$ 6.60	\$ 6.80
	Adult Swim & Spa (Karori Pool)	\$ 9.00	\$ 9.20
	Adult Swim & Spa (Tawa/Thorndon Pool)	\$ 8.50	\$ 8.60
	Adult Swim Concession Pass (10 trip)	\$ 59.40	\$ 61.20
	Child Concession Pass Old (10 trip)	\$ 35.10	\$ 36.00
	Child Swim	\$ 3.90	\$ 4.00
	Child Swim / Spa Combo	\$ 5.40	\$ 5.50
	Child Swim / Spa Combo Concession Pass (10 Trip)	\$ 48.60	\$ 49.50
	Child Swim Concession Pass (10 trip)	\$ 35.10	\$ 36.00
	Karori Pool - Hydro slide	\$ 1.00	\$ 1.20
	Karori Pool - Spa & Swim Concession Pass (10 Trip)	\$ 81.00	\$ 82.80
	Karori Pool - Spa Concession Pass (10 Trip)	\$ 48.60	\$ 49.50

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Khandallah Adult	\$ 3.20	\$ 3.30
	Khandallah Child	\$ 1.60	\$ 1.80
	Khandallah Pool Adult Concession Pass (10 Trip)	\$ 28.80	\$ 29.70
	Khandallah Pool Child Concession Pass (10 Trip)	\$ 14.40	\$ 16.20
	KSP - Adult Hot Spot	\$ 6.40	\$ 6.50
	Tawa - Adult Offpeak Swim	\$ 3.30	\$ 3.40
	Tawa Offpeak Adult Concession Pass (10 trip)	\$ 33.00	\$ 34.00
	Thorndon & Tawa - Spa & Swim Combo Concession Pass (10 Trip)	\$ 76.50	\$ 77.40
	WRAC - Event Adult Swim	\$ 6.60	\$ 6.80
	WRAC/KSP/Freyberg - Adult Swim / Hot Spot Combo Concession Pass (10 trip)	\$ 90.00	\$ 91.80
	WRAC/KSP/Freyberg - Adult Swim/Hot Spot Combo	\$ 10.00	\$ 10.20
	WRAC/KSP/Freyberg - Hot Spot Adult	\$ 6.40	\$ 6.50
	WRAC/KSP/Freyberg - Hot Spot Adult Concession Pass (10 Trip)	\$ 57.60	\$ 58.50
	Khandallah Pool - School Swim	\$ 1.60	\$ 1.70
	Swim Membership Adult - Direct Debit (Fortnightly)	\$ 29.98	\$ 30.70
	Swim Membership Adult - Direct Debit (Monthly)	\$ 64.96	\$ 66.50
	Swim Membership Adult - Upfront (Yearly)	\$ 775.00	\$ 798.00
	Swim Membership Aquatic Club Member Adult - Direct Debit (Fortnightly)	\$ 25.48	\$ 26.10
	Swim Membership Aquatic Club Member Adult - Direct Debit (Monthly)	\$ 55.21	\$ 56.53
	Swim Membership Aquatic Club Member Adult - Upfront (Yearly)	\$ 658.00	\$ 678.30
	Swim Membership Aquatic Club Member Child - Direct Debit (Fortnightly)	\$ 14.88	\$ 15.27
	Swim Membership Aquatic Club Member Child - Direct Debit (Monthly)	\$ 32.22	\$ 33.08
	Swim Membership Aquatic Club Member Child - Upfront (Yearly)	\$ 387.18	\$ 396.95
	Swim Membership Child - Direct Debit (Fortnightly)	\$ 17.50	\$ 17.96

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Swim Membership Child - Direct Debit (Monthly)	\$ 37.90	\$ 38.92
	Swim Membership Child - Upfront (Yearly)	\$ 455.50	\$ 467.00
	Swim Membership CSC Adult - Direct Debit (Fortnightly)	\$ 23.98	\$ 24.56
	Swim Membership CSC Adult - Direct Debit (Monthly)	\$ 51.97	\$ 53.20
	Swim Membership CSC Adult - Upfront (Yearly)	\$ 620.00	\$ 638.40
	Swim Membership CSC Child - Direct Debit (Fortnightly)	\$ 14.00	\$ 14.37
	Swim Membership CSC Child - Direct Debit (Monthly)	\$ 30.32	\$ 31.14
	Swim Membership CSC Child - Upfront (Yearly)	\$ 364.40	\$ 373.60
	Swim Membership Student - Direct Debit (Fortnightly)	\$ 23.98	\$ 24.56
	Swim Membership Student - Direct Debit (Monthly)	\$ 51.97	\$ 53.20
	Swim Membership Student - Upfront (Yearly)	\$ 620.00	\$ 638.40
	Swim Membership Super Gold - Direct Debit (Fortnightly)	\$ 23.98	\$ 24.55
	Swim Membership Super Gold - Direct Debit (Monthly)	\$ 51.97	\$ 53.20
	Swim Membership Super Gold - Upfront (Yearly)	\$ 620.00	\$ 638.40
	School Swim	\$ 1.60	\$ 1.70
	Karori - Inflatable	\$ 66.50	\$ 70.00
	Karori - Slide Staff	\$ 30.00	\$ 40.00
	Pools - Lifeguard (per hour)	\$ 30.00	\$ 40.00
	Tawa - Inflatable	\$ 61.50	\$ 65.00
	Thorndon - 1 hour 0 - 25 people	\$ 160.00	\$ 180.00
	Thorndon - 1 hour 26 - 50 people	\$ 210.00	\$ 225.00
	Thorndon - 1 hour 50 - 100 people	\$ 280.00	\$ 300.00
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	Thorndon - 2 hours 26 - 50 people	\$ 280.00	\$ 300.00
	Thorndon - 2 hours 50 - 100 people	\$ 360.00	\$ 375.00
	WRAC - Inflatable	\$ 80.00	\$ 90.00
	WRAC - Small Inflatable	\$ 40.00	\$ 45.00
	Group Fitness Land Based Casual Entry	\$ 11.00	\$ 13.00
	Group Fitness Land Based Concession Pass (10 trip)	\$ 99.00	\$ 117.00
	Spin - Casual	\$ 11.00	\$ 13.00

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Student - Group Fitness Land Based Casual Entry	\$ 8.80	\$ 10.40
	Student - Group Fitness Land Based Convenience Pass (10 trip)	\$ 88.00	\$ 104.00
	WRAC - Spin Concession Pass (10 Trip)	\$ 99.00	\$ 117.00
5.1.2 Sports Fields	Athletics Casual	\$ 682.50	\$ 699.56
	Athletics Seasonal	\$ 500.00	\$ 512.50
	Athletics WRFU Speed Trials	\$ 144.00	\$ 147.60
	Changing Room & Field 1 night	\$ 210.00	\$ 215.25
	Changing Room & Field 1 night (season)	\$ 880.00	\$ 902.00
	Changing Room & Field 2 nights (season)	\$ 1,700.00	\$ 1,742.50
	Changing Room & Field 3 nights (season)	\$ 2,580.00	\$ 2,644.50
	Changing Room & Field 4 nights (season)	\$ 3,425.00	\$ 3,510.63
	Changing Room & Field 5 nights (season)	\$ 4,275.00	\$ 4,381.88
	Cricket Casual Artificial (Concrete Base)	\$ 175.00	\$ 179.38
	Cricket Casual Artificial (Grass Base)	\$ 175.00	\$ 179.38
	Cricket Casual Level 1	\$ 400.00	\$ 410.00
	Cricket Casual Level 2	\$ 268.80	\$ 275.52
	Cricket Seasonal Artificial (Concrete Base)	\$ 45.45	\$ 46.59
	Cricket Seasonal Artificial (Grass Base)	\$ 35.90	\$ 36.80
	Cricket Seasonal Level 1	\$ 143.18	\$ 146.76
	Cricket Seasonal Level 2	\$ 119.32	\$ 122.30
	Cricket Seasonal Level 3	\$ 66.48	\$ 68.14
	Croquet Casual	\$ 178.00	\$ 182.45
	Croquet Seasonal	\$ 40.57	\$ 41.58
	Cycling Casual	\$ 185.00	\$ 189.63
	Cycling Seasonal	\$ 84.09	\$ 86.19
	Groundsman - hourly rate (minimum 2 hours)	\$ 50.00	\$ 51.25
	Marquee > 100m2	\$ 1,380.00	\$ 1,414.50
	Marquee Booking Fee (non-refundable)	\$ 86.00	\$ 88.15
	Marquee up to 100m2	\$ 860.00	\$ 881.50
	Marquee up to 50m2	\$ 520.00	\$ 533.00
	Netball Casual	\$ 47.25	\$ 48.43

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Netball Off-season or organised	\$ 15.00	\$ 15.38
	Netball per season	\$ 7.16	\$ 7.34
	Newtown Park	\$ 682.50	\$ 699.56
	Newtown Park Function Room	\$ 30.00	\$ 32.50
	Rugby League Park	\$ 682.50	\$ 699.56
	Rugby, League, Football, Aussie Rules Casual Level 1	\$ 150.00	\$ 153.75
	Rugby, League, Football, Aussie Rules Casual Level 2	\$ 115.50	\$ 118.39
	Rugby, League, Football, Aussie Rules Casual Level 3	\$ 89.00	\$ 91.23
	Rugby, League, Football, Aussie Rules Seasonal Level 1	\$ 115.74	\$ 118.63
	Rugby, League, Football, Aussie Rules Seasonal Level 2	\$ 77.56	\$ 79.50
	Rugby, League, Football, Aussie Rules Seasonal Level 3	\$ 62.05	\$ 63.60
	Softball Casual Level 1	\$ 185.00	\$ 189.63
	Softball Casual Level 2	\$ 135.00	\$ 138.38
	Softball Seasonal Level 1	\$ 37.23	\$ 38.16
	Softball Seasonal Level 2	\$ 24.82	\$ 25.44
	Tennis Casual	\$ 47.25	\$ 48.43
	Tennis Off-season or organised	\$ 20.00	\$ 20.50
	Tennis per season	\$ 9.55	\$ 9.79
	Toilets and Changing Rooms Only Open	\$ 90.00	\$ 92.25
	Toilets Open	\$ 42.00	\$ 43.05
	Touch, 5-a-side, Ultimate, Gridiron Casual Level 1	\$ 199.50	\$ 204.49
	Touch, 5-a-side, Ultimate, Gridiron Casual Level 2	\$ 160.00	\$ 164.00
	Touch, 5-a-side, Ultimate, Gridiron Seasonal Level 1	\$ 76.36	\$ 78.27
	Touch, 5-a-side, Ultimate, Gridiron Seasonal Level 2	\$ 57.27	\$ 58.70
	Tournament Base fee - field/day	\$ 340.00	\$ 348.50
	Training Ground Only 1 night	\$ 110.00	\$ 112.75
	Training Ground Only 1 night (season)	\$ 420.00	\$ 430.50
	Training Ground Only 2 nights (season)	\$ 800.00	\$ 820.00
	Training Ground Only 3 nights (season)	\$ 1,200.00	\$ 1,230.00
	Training Ground Only 4 nights (season)	\$ 1,560.00	\$ 1,599.00

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Training Ground Only 5 nights (season)	\$ 1,920.00	\$ 1,968.00
5.1.4 Recreation Centre	Rec Centre - Casual Adult	\$ 4.00	\$ 4.50
	Kilbirnie Rec - Inflatable	\$ 60.00	\$ 65.00
	ASB - Concession Pass Adult (20 Trip)	\$ 72.00	\$ 81.00
	ASB - Extra Staff	\$ 30.00	\$ 40.00
5.1.7 Marinas	Evans Bay Visitor Day	\$ 30.00	\$ 32.00
	Evans Bay Visitor Month	\$ 630.00	\$ 674.00
	Evans Bay Non tenant use of Breastwork	\$ 75.00	\$ 80.00
	Evans Bay Berth	\$ 3,133.00	\$ 3,352.00
	Evans Bay Berth (Sea Rescue Jetty)	\$ 1,841.00	\$ 1,970.00
	Evans Bay Boat Shed (8 to 11)	\$ 1,235.00	\$ 1,321.00
	Evans Bay Boat Shed (1 to 7, 12 to 32)	\$ 2,465.00	\$ 2,638.00
	Evans Bay Boat Shed (33 to 46)	\$ 3,690.00	\$ 3,948.00
	Evans Bay Dinghy Locker	\$ 368.00	\$ 394.00
	Evans Bay Live-Aboard fee	\$ 645.00	\$ 1,200.00
	Evans Bay Trailer Park monthly	\$ 140.00	\$ 150.00
	Clyde Quay Mooring	\$ 1,293.00	\$ 1,435.00
	Clyde Quay Boat Shed (1 to 13)	\$ 2,712.00	\$ 3,010.00
	Clyde Quay Boat Shed (14 to 27)	\$ 2,441.00	\$ 2,710.00
	Clyde Quay Boat Shed (28, 29)	\$ 3,389.00	\$ 3,762.00
	Clyde Quay Boat Shed (38B)	\$ 1,957.00	\$ 2,172.00
	Clyde Quay Boat Shed (38A to 42B, 48A, 48B)	\$ 2,809.00	\$ 3,118.00
	Clyde Quay Boat Shed (43A to 47B)	\$ 3,256.00	\$ 3,614.00
Clyde Quay Dinghy Rack	\$ 226.00	\$ 251.00	
5.3.1 Burials and cremations	Wooden Urn - Adult	\$ 95.00	\$ 100.00
	Weekend Fee - Casket Interment	\$ 646.00	\$ 678.00
	Weekend Fee - Ash Interment	\$ 215.00	\$ 226.00
	Weekend Cremation	\$ 342.00	\$ 359.00
	Temporary Grave Marker	\$ 149.00	\$ 155.00
	Public Holiday Fee - Cremation	\$ 621.00	\$ 652.00
	Public Holiday Fee - Burial	\$ 907.00	\$ 952.00
	Public Holiday Fee - Ash Interment	\$ 454.00	\$ 477.00
	Plot Search Charge (first 3 free)	\$ 20.00	\$ 25.00
Overtime - Niche Placement	\$ 120.00	\$ 126.00	

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Overtime - Chapel Hire (per half hour)	\$ 204.00	\$ 214.00
	Overtime - Burial	\$ 646.00	\$ 675.00
	Overtime - Ash Scatter	\$ 195.00	\$ 205.00
	Overtime - Ash Interment	\$ 215.00	\$ 226.00
	Overtime - Ash Collection Express	\$ 200.00	\$ 210.00
	Outside District Indigent - Cremation and Burial	\$ 142.00	\$ 149.00
	Outside District - Second Interment	\$ 571.00	\$ 600.00
	Outside District - Casket	\$ 1,071.00	\$ 1,125.00
	Outside District - Ash Scatter	\$ 42.00	\$ 44.00
	Outside District - Ash Interment	\$ 430.00	\$ 452.00
	Muslim Boards - Infant	\$ 105.00	\$ 110.00
	Muslim Boards - Adult	\$ 178.00	\$ 187.00
	Delivery Only	\$ 726.00	\$ 762.00
	01/2A Ash Plot	\$ 505.00	\$ 530.00
	Arrangement fee	\$ -	\$ 150.00
5.3.3 Public Health	Dog Euthanasiation - up to 20kg	\$ -	\$ 176.00
	Dog Euthanasiation - 21 - 40kg	\$ -	\$ 219.00
	Dog Euthanasiation - over 40kg	\$ -	\$ 262.00
	Dog Walker Licence	\$ -	\$ 191.50
	Dog Walker Renewal	\$ -	\$ 61.00
	All Public Health fees (excluding alcohol licensing)	various	Inflation Full List provided for Consultation Document
6.2.1 Building Control and Facilitation	Building Warrant of Fitness - Annual Certificate. This is the base charge for 1 specified system. Additional charges will apply for the time over 1 hour	\$ 81.75	\$ 104.50
	Building Warrant of Fitness - Annual Certificate. This is the base charge for 2-10 specified system. Additional charges will apply for the time over 2 hours	\$ 163.50	\$ 209.00
	Building Warrant of Fitness - Annual Certificate. This is the base charge for 11+ specified system. Additional charges will apply for the time over 3 hours	\$ 244.75	\$ 313.50
	Lodgement fee	\$ 198.00	\$ 396.00
	Less than \$10,000 (Residential 1, 2 and 3)	\$ 1,331.63	\$ 2,663.50

Activity Group	Name of Fee	LTP 21/22 Fee	Proposed fees 2022/23
	Less than \$10,000 (Commercial 1 and 2 buildings)	\$ 1,722.75	\$ 3,445.50
	Less than \$10,000 (Commercial 3 buildings)	\$ 2,036.63	\$ 4,073.50
	\$10,001 - \$20,000 (Residential 1, 2 and 3)	\$ 2,192.63	\$ 4,385.50
	\$10,001 - \$20,000 (Commercial 1 and 2 buildings)	\$ 2,192.63	\$ 4,385.50
	\$10,001 - \$20,000 (Commercial 3 buildings)	\$ 2,192.63	\$ 4,385.50
	\$20,001 - \$100,000 (Residential 1, 2 and 3)	\$ 2,975.63	\$ 5,951.50
	\$20,001 - \$100,000 (Commercial 1 and 2 buildings)	\$ 2,975.63	\$ 5,951.50
	\$20,001 - \$100,000 (Commercial 3 buildings)	\$ 2,975.63	\$ 5,951.50
	\$100,001 - \$500,000 (Residential 1, 2 and 3)	\$ 3,132.38	\$ 6,265.00
	\$100,001 - \$500,000 (Commercial 1 and 2 buildings)	\$ 4,071.00	\$ 8,142.00
	\$100,001 - \$500,000 (Commercial 3 buildings)	\$ 4,071.00	\$ 8,142.00
	\$500,001 - \$1,000,000 (Residential 1, 2 and 3)	\$ 5,636.63	\$ 11,273.50
	\$500,001 - \$1,000,000 (Commercial 1 and 2 buildings)	\$ 6,263.63	\$ 12,527.50
	\$500,001 - \$1,000,000 (Commercial 3 buildings)	\$ 6,890.25	\$ 13,780.50
	\$1,000,000 + (Residential 1, 2 and 3)	\$ 7,046.25	\$ 14,092.50
	\$1,000,000 + (Commercial 1 and 2 buildings)	\$ 7,046.25	\$ 14,092.50
	\$1,000,000 + (Commercial 3 buildings)	\$ 7,046.25	\$ 14,092.50
	for each \$500,000 or part thereof over \$1,000,000	\$ 1,487.63	\$ 2,975.50
6.2.2 Development Control and Facilitation	Town Planning and Building Certificates for the purposes of the Sale and Supply of Act 2012 (fixed fee): - Town planning certificate - Building certificate - Both	Town planning \$500.50 Building certificate \$209 Both certificate \$709.50	Town planning \$276.25 Building certificate \$209 Both certificates \$485.25
	Initial application fee - s226	\$ -	\$ 806.00

RESIDUAL WASTE DISPOSAL OPTIONS FOR CONSULTATION 2022

Kōrero taunaki

Summary of considerations

Purpose

1. This report to Pūroro Maherehere | Annual Plan/Long-Term Plan Committee provides a background to the development of a short list of potential residual waste disposal options for Annual Plan/Long Term Plan Committee consideration. For clarity, reference to 'residual waste' refers to the waste streams leftover after upstream waste minimisation and diversion initiatives have been undertaken.
2. Relatedly, this report asks the Committee to agree to undertake public consultation on three residual waste disposal options as part of the Annual Plan consultation process in April 2022.

Strategic alignment with community wellbeing outcomes and priority areas

Aligns with the following strategies and priority areas:

- | | |
|--|--|
| Strategic alignment with priority objective areas from Long-term Plan 2021–2031 | <ul style="list-style-type: none"><input checked="" type="checkbox"/> Sustainable, natural eco city<input type="checkbox"/> People friendly, compact, safe and accessible capital city<input type="checkbox"/> Innovative, inclusive and creative city<input type="checkbox"/> Dynamic and sustainable economy
<input type="checkbox"/> Functioning, resilient and reliable three waters infrastructure<input checked="" type="checkbox"/> Affordable, resilient and safe place to live<input type="checkbox"/> Safe, resilient and reliable core transport infrastructure network<input type="checkbox"/> Fit-for-purpose community, creative and cultural spaces<input checked="" type="checkbox"/> Accelerating zero-carbon and waste-free transition<input type="checkbox"/> Strong partnerships with mana whenua |
|--|--|

Relevant Previous decisions

Outline relevant previous decisions that pertain to the decision being considered in this paper.

A landfill extension has been noted in the Long-term Plan since 2006. A consent application was submitted in 2012, but subsequently put on hold in 2013, until 2018. Engagement on a revised design in 2019 faced public opposition and the project was put on hold mid-2020, pending the decision on sludge minimisation infrastructure. Sludge minimisation infrastructure was included in the 2021-2031 Long-term Plan, although the final funding decision on this is pending.

In October 2021, the Infrastructure Committee requested officers to report back on a range of related matters, including but not limited to revised evaluation criterion to assist in assessing options, and a preferred option identified. While the Infrastructure Committee initially directed officers to report back with a waste minimisation roadmap

implementation plan in time for the Annual Plan, upon further consideration in December 2021, this reporting timeframe was revised to align with the development of the next draft Wellington City Waste Management and Minimisation Action Plan, which is due for Committee consideration in October 2022.

Significance

The decision is rated high significance in accordance with schedule 1 of the Council’s Significance and Engagement Policy.

The decision is rated high significance in accordance with schedule 1 of the Council’s Significance and Engagement Policy. Running the Southern Landfill is a significant Council service and one of the residual waste disposal options for consideration is to cease this service and to export waste to another landfill. While the closure of the Southern Landfill is deemed a reasonably practicable option, the Southern Landfill is a strategic asset listed in the Council’s Significance and Engagement Policy. As such, any decision to cease undertaking such a service can only be made if it is provided for explicitly in the Long-term Plan.

It is noted that decision making in respect of the landfill has previously received a high level of community interest. The public is interested in issues of waste disposal. Retiring the landfill would additionally have an impact on Council finances. The current landfill site involves important natural resources, particularly the mauri of streams running through the site.

Financial considerations

Nil Budgetary provision in Annual Plan / Long-term Plan Unbudgeted \$X

3. The 2021-2031 Long-term Plan includes a \$57m placeholder for a landfill extension. Financial implications for other options have not been included in the Long-term Plan, and will vary depending on a final decision following the consultation.

Risk

Low Medium High Extreme

Author	Emma Richardson, Senior Waste Planner
Authoriser	Robert Hon, Waste Operations Manager Siobhan Procter, Chief Infrastructure Officer

Taunakitanga

Officers' Recommendations

Officers recommend the following motion

That Pūroro Maherehere | Annual Plan/Long-Term Plan Committee:

- 1) Receive the information
- 2) Notes that this report should be read in conjunction with the attached information:
 - i. Appendix 1 - Airspace Projections for the Southern Landfill
 - ii. Appendix 2 - Final Waste Management Option Assessment for Wellington City Council (by Beca Consulting dated 27th January 2022)
 - iii. Appendix 3 - Revised Criteria with associated Working Party Input (by Beca Consulting)
 - iv. Appendix 4 - Southern Landfill: Piggyback Option & SLS4 (by Tonkin and Taylor dated December 2021)
 - v. Appendix 5 – Southern Landfill Piggyback Option (by Tonkin and Taylor dated January 2022)
 - vi. Appendix 6 - Advantages & Disadvantages of the Short-listed Residual Waste Disposal Options
- 3) Agree that Landfill Redevelopment (Piggyback Option) is the Council's preferred residual waste disposal option, on the basis that it:
 - i. Performs above the other two short-listed options when assessed using a Multi-Criteria Analysis criteria assessment.
 - ii. Would not inhibit a reduction of waste volumes over the operational life of the landfill.
 - iii. Can be readily implemented as a residual waste disposal solution by June 2026.
 - iv. Is the option generally supported by participants of the Residual Waste Disposal Option Working Party.
- 4) Approve the following short list of residual waste disposal options for public consultation in accordance with the Special Consultative Procedure and in conjunction with the broader Annual Plan consultation process:
 - i. Landfill Redevelopment (Piggyback Option)
 - ii. Landfill Closure and the associated export of waste to another disposal facility
 - iii. Energy from Waste
- 5) Notes that the Southern Landfill is a critical piece of Wellington's infrastructure and is a strategic asset listed in the Council's Significance and Engagement Policy.
- 6) Notes that any decision to close the Southern Landfill can only occur if it has been provided for in the Long-term Plan.

- 7) Direct officers to report back to the 8 March Annual Plan/Long Term Plan Committee with a consultation document and a consultation plan for review, prior to audit of the consultation material.
- 8) Notes that officers will promote open dialogue with Taranaki Whanui and Ngati Toa iwi throughout 2022 to explore any potential waste management and minimisation partnership opportunities, and will report back with any iwi feedback on the residual waste disposal options proposal on the completion of public consultation in May 2022.

Whakarāpopoto

Executive Summary

4. The Southern Landfill is a critical piece of Wellington's infrastructure. It is the only facility in Wellington City that accepts the city's municipal solid waste (MSW), special waste (including dewatered sewage sludge), contaminated soil and asbestos-containing materials. The Southern Landfill provides a significant Council service and is identified as strategic asset in the Council's Significance and Engagement Policy.
5. The resource consent that allows the disposal of waste into the Southern Landfill will expire in June 2026. At the same time, airspace capacity necessary for the disposal of waste at the landfill is projected to run out by June 2026. At this point, the disposal of waste into the Southern Landfill must cease, unless an alternative waste disposal option is otherwise secured.
6. Given the potential project planning, development time and consenting requirements for an alternative waste disposal option within Wellington City, the Council must now take steps to facilitate the consideration of future waste disposal post-2026.
7. develop a set of principles and evaluation criteria against which options can be assessed and a preferred option identified, that meets the threshold for a SCP (if required)". Officers were also asked to "embark on a working party process with Ōwhiro Bay Residents Association, Friends of Ōwhiro Stream, members of the Community Liaison Group, and other relevant groups to develop recommendations on the next stages of the residual waste".
8. The Residual Waste Disposal Options Working Party (the Working Party) was established in November 2021. The Working Party met twice and provided feedback on a suite of draft criteria and considered the following long list of residual waste disposal options:
 - i. Landfill Closure and the associated export of waste to another disposal facility
 - ii. Landfill Redevelopment (Piggyback) Option
 - iii. Landfill Extension – Stage 4
 - iv. Energy from Waste
9. After considering Working Party workshop feedback, Beca Consulting developed a revised list of evaluation criteria for the options assessment, and have identified a preferred option based on assessment findings (See **Appendix 3**).
10. Based on the results of this assessment, the Landfill Redevelopment (Piggyback) option has been identified as the preferred waste disposal solution from the long list of options. In summary, this option was selected on the basis that it performs above other options in a number of categories, and in areas where the option does not fully meet the ranking criteria it still performs similarly to other options.

11. Following the provision of supplementary technical feasibility studies relating to the two respective landfill options (see **Appendix 4 and 5**), technical feasibility issues associated with the Stage 4 Landfill Expansion Option have resulted in the removal of Stage 4 in the final short list of options presented to the Committee for consideration. It is noted that such feasibility issues were primarily premised on the anticipated consenting challenges, the scale of associated earthworks and vegetation clearance in an area of regenerated vegetation, the lengthy construction and planning time horizon required for this development, and the associated costs of the development. For this reason, it was determined that the Stage 4 landfill extension was not reasonably practicable as a waste disposal solution for Wellington City.
12. The three residual waste disposal options short-listed for Committee consideration therefore include:
 1. Landfill Closure and the associated export of waste to another disposal facility
 2. Landfill Redevelopment (Piggyback Option)
 3. Energy from Waste
13. As the Southern Landfill is a critical piece of Wellington's infrastructure and is a strategic asset listed in the Council's Significance and Engagement Policy, any decision to close the landfill can only occur if it has been provided for in the Long-term Plan. As the closure of the Southern Landfill and the export of waste exists as a reasonably practicable option for the Council's consideration, it is recommended that Council progress the short-listed waste disposal options to public consultation in accordance with the Special Consultative Process.
14. It is noted that any decision to not to progress the residual waste disposal options for public consultation, or to delay consultation of the residual waste disposal options until the 2023/24 Annual Plan consultation process, risks resulting in the temporary or permanent closure of the Southern Landfill in June 2026. In turn, the closure of the landfill will also necessitate the export of Wellington City's municipal waste to another landfill for disposal.

Takenga mai

Background

15. The Southern Landfill is a critical piece of Wellington's infrastructure and is the only facility in Wellington City that accepts the city's municipal solid waste (MSW), special waste (including dewatered sewage sludge), contaminated soil and asbestos-containing materials.
16. The Southern Landfill is also identified as strategic asset listed in the Significance and Engagement policy. It provides Wellington City with a significant service, despite not all the City's municipal waste being disposed there.
17. Income from the Southern Landfill (around \$17 million per annum) currently funds a range of services and activities, including: the Council's kerbside recycling service; waste minimisation and behaviour change initiatives; green waste diversion to composting service; a transfer station for the residential use; and onsite resource recovery activities - such as the Tip Shop.
18. The resource consent permitting the disposal of waste into the Southern landfill will expire in June 2026. Additionally, at current usage rates, the existing landfill is forecast to be "full up" within a similar timeframe, details of which can be found in **Appendix 1**.

19. As a background to this work, the Council initially engaged with the community on the “stage 4” extension to the Southern Landfill in 2019. At that time, due to the high level of interest and resistance to the proposal, Council decided to delay formal consultation until more information was available about future waste minimisation, alternative technologies, and sludge reduction.
20. In November 2021, the Council committed to funding the design and associated consenting and land acquisition for a sludge minimisation solution. This will ultimately be funded through the Infrastructure Funding and Finance Act 2020. While a final decision remains pending, planning for an alternative sludge disposal facility is well underway with the intent to have an alternative sludge disposal facility in place by 2026.
21. Work is also currently underway to establish the Council’s future strategic waste minimisation infrastructure and investment requirements. A preliminary resource recovery business case that will help set the strategic direction for waste minimisation investment planning is scheduled to be considered by the Committee on 23rd March 2022.
22. However, despite the Council’s scope to support waste minimisation and resource recovery within Wellington City over the next 15 years, estimates suggests that there could still be up to 34,000 tonnes of municipal waste generated by Wellington City in 2036¹. In addition, the Council can anticipate the ongoing need for the disposal of asbestos and contaminated soil, as well as increases in waste disposal resulting from population growth and the resulting increase in construction and demolition waste as the City’s construction programme steadily increases over the next decade.
23. In October 2021 officers presented
 - i. Landfill Closure and the export of Waste to another landfill Landfill (Piggyback) Redevelopment The establishment of a Waste to Energy Plant The establishment of a Material Recycling Facility (MRF) to support waste reductionThe establishment of a Mechanical Biological Waste Treatment Plant to support waste reduction
 12. *Direct officers to progress two parallel work streams (in order to ensure that all reasonably practicable options are available for the Council’s consideration of the issue of the disposal of residual waste beyond 2026): Continue to investigate and analyse further minimisation and waste disposal options and consultation requirements, reporting to the Infrastructure Committee.Undertake the work to initiate and lodge the necessary resource consent applications to extend the Southern LandfillRequest officers develop a set of principles and evaluation criteria against which options can be assessed and a preferred option identified, that meets the threshold for a SCP (if required), including the strategic review roadmap outcomes and carbon impacts.Request officers to provide information regarding prolonging the life of the current landfill and the results of those investigations.*
 20. *Request officers to embark on a working party process with Ōwhiro Bay Residents Association, Friends of Ōwhiro Stream, members of the Community Liaison Group, and other relevant groups to develop recommendations on the next stages of the residual waste.*

¹ As context, in 2021, the Southern Landfill received 79,900 tonnes of municipal waste (excluding asbestos and contaminated soil).

-
24. In line with these directives, in November 2021 the Residual Waste Disposal Options Working Party was established. This Working Party is made up of representatives from the following groups:
- Friends of Owhiro Stream (FOOS)
 - Owhiro Bay Residents Association
 - Greater Brooklyn Residents Association
 - Zealandia
 - Waste Free Wellington
 - Para Kore
 - Waste Management
 - EnviroWaste
25. Assisted by Beca Consulting, the Council facilitated two separate workshops with the Working Party. The first workshop was held on the 18th of November 2021 and the second on the 14th December 2021. As proposed by officers, the primary purpose of the Working Party was to provide considered feedback and suggested recommendations on the following matters:
- i. The Multi-Criteria Assessment process, to determine a shortlist of residual waste disposal options for Wellington City Council to consider.
 - ii. The criteria and weighting (if any) that each waste disposal option should be assessed against.
 - iii. The final waste disposal options to be assessed through the Multi-Criteria Analysis criteria assessment process.
 - iv. Feedback on the results of the Multi-Criteria Analysis criteria assessment process.
26. A full summary of the feedback provided by the Working Group can be found in **Appendix 2** (see Beca report Appendices A, B and C).
27. After considering Working Party workshop feedback, Beca Consulting developed a revised list of evaluation criteria to assess the options and to identify a preferred option.
28. The following discussion provides the long list of options considered by the Working Party, along with a summary of the feedback received. It also explains how the initial set of Multi-Criteria Analysis criteria (as considered by the Infrastructure Committee in October 2021) has been revised following Working Party feedback. After outlining the findings of the Multi-Criteria Analysis process and considering the matter of technical feasibility, a short list of options is identified for consideration.

Kōrerorero

Discussion

Waste Disposal Options for Wellington City

29. In October 2021 following the Infrastructure Committee's decision to instruct Officers to "undertake the work to initiate and lodge the necessary resource consent applications to extend the Southern Landfill" led to a reduced long list of options which now solely focus on residual waste disposal.
30. Given that both the the resource recovery network within Wellington City. Other options will include construction and demolition waste processing, organic material processing/mechanical biological waste treatment; and a commercial Materials Recycling Facility

	Option	Description
1	Landfill Closure and the associated export of waste to another disposal facility	This option would involve the closure of the Southern Landfill, which would necessitate the export of Wellington City's municipal waste to another landfill site.
2	Landfill Redevelopment (Piggyback) Option	This option would involve the brownfield redevelopment of part of an existing area of the Southern Landfill and would provide approximately 2 million cubic metres of landfill airspace for waste disposal. This option proposes the establishment of a fully lined landfill in accordance with WasteMINZ technical guidance.
3	Landfill Extension - Stage 4	This would involve the expansion of the existing landfill into an area of regenerating bush located to the north of the current landfill activities and would fill in an area further up the valley. This would provide a minimum of approximately 2.5 million cubic metres of landfill airspace for waste disposal. This option proposes a new, fully lined landfill in accordance with WasteMINZ technical guidance.
4	Energy from waste	This would involve the establishment of a new Waste to Energy Plant at the Southern Landfill. This new facility would enable the combustion of waste material. This activity uses the heat generated from the waste material to produce electricity (and possibly heat). The output of this process is an ash, which has a significantly reduced mass and volume, but a higher concentration of contaminants compared to the input waste. Residual waste outputs would

	Option	Description
		need to be disposed of into a landfill.

31. As additional context, a summary of Working Party's overall feedback related to each potential waste disposal option is provided in Table 2. A more detailed breakdown of related feedback from each individual Working Party participant can be found in **Appendix 3**.
32. **Table 2:** Summary of Working Party Feedback on the Revised Long Lis of Residual Waste Disposal Options

Revised Residual Waste Options	Summary of Working Party Feedback
Landfill Closure (and the associated export of waste)	Mixed - but mostly do not support as a current option, but instead support as longer-term goal (~20 year) after landfill waste reduction/following piggyback option. Comments: <ul style="list-style-type: none"> ▪ Limits the City's control on waste ▪ Increases costs ▪ Inefficient and does not encourage waste minimisation (shifts issue) ▪ Possible extension beyond Wellington region, however reluctance/opposition of waste exports to other landfills
Landfill Piggyback Option (i.e. brownfield redevelopment)	Mixed - some strong support for this option (as opposed to the landfill extension). Preference for Interim extension for WMMP decision making on waste volumes/types. Comments: <ul style="list-style-type: none"> ▪ Concerns regarding relocation of composting operations ▪ Further assessment required of cost breakdowns; the potential for stream/tunnel collapse mitigation; and impacts of annual waste volume reduction
Landfill Extension - Stage 4	Mostly do not support Comments include: <ul style="list-style-type: none"> ▪ May provide time for developing technologies, however, may not be the best use of funds and may not incentivise waste reduction ▪ Concerns regarding increased windblown pollution resulting in odour, increased pests & risk of breaches (Zealandia), costs, environmental & ecological impacts ▪ Further assessment of impacts required
Energy from Waste	Strongly not supported as a residual waste option - may be considered at an upstream level Comments:

Revised Residual Waste Options	Summary of Working Party Feedback
	<ul style="list-style-type: none"> - Similar waste disposal solution rejected by EU - Challenge with fitting it into a circular economy - Concerns regarding waste burnage, final waste volume, efficiency, cost, site footprint, perpetuation of waste creation rather than reduction, along with an incompatibility with the NZ and city/regional waste minimisation process

The Multi-Criteria Analysis – Criteria Identification

33. Following the Working Party’s consideration of a suite of draft assessment criteria and draft long list of waste disposal options, Working Party feedback was documented, summarised and key themes were incorporated into the revised Multi-Criteria Analysis process.
34. It is noted that Working Party feedback did not result in any further revisions to the long list of waste disposal options. However, there were several amendments to a range of criterion. For the details of the changes made to the criteria, please refer to **Appendix 3**. For a list of the revised criteria see Table 3.
35. In summary, these amendments included, but were not limited to:
 - The removal of all prerequisite ‘absolute criteria’, including technical maturity, time frame, scalability. While these criteria were initially included to ensure the technical feasibility of long listed options, these prerequisite standards have now been incorporated for consideration as general scoring criteria. It is noted that while this amendment was made in line with Working Party feedback, the technical feasibility remains an essential for consideration and must be considered prior to the shortlisting of options.
 - The removal of a criterion premised on the consideration of resource recovery options and the associated production of secondary products.
 - The stronger integration of Te Ao Māori across the criteria.
 - The establishment of a new criterion relating to Te Ao Māori and the importance of cultural suitability when considering an option.
36. It is noted that officers met with representatives from Taranaki Whanui and Ngati Toa Iwi to provide an update on the residual waste disposal options work in September 2021. At this point, both parties expressed a high interest in the waste management and minimisation work, however they similarly noted a lack of resources to engage in this space.
37. In January 2022, representatives from the Council and Taranaki Whanui iwi had a follow-up meeting to further discuss the scope of the waste management and minimisation work programme currently underway. During this discussion iwi were advised of the upcoming Annual Plan Committee meeting, which would consider a short list of residual waste disposal options for public consultation. While Taranaki Whanui indicated that they did not intend to provide feedback on the options proposal prior to the Committee meeting, they did signal their interest in exploring waste-related opportunities for partnership with the Council going forward. Possible opportunities discussed included:

- The potential for the joint development of an Environmental Management Plan associated with any necessary resource consent required to advance the residual waste disposal options work.
- A partnership approach to support the development of the next Waste Management and Minimisation Plan.
- Interest in exploring the potential for iwi involvement in future resource recovery opportunities relevant to Wellington City, and the wider region.

Ongoing dialogue between both Taranaki Whanui and Ngati Toa iwi and the Council, is anticipated throughout 2022 to further discuss partnership opportunities.

Table 3: Revised MCA Criteria with Definitions

	Criteria	Description
1	GHG Emissions	Te Atakura First to Zero is WCC's blueprint for reducing greenhouse gas emissions produced in Wellington City to zero by 2050. As such, WCC's Final Waste Option should align with this ambition.
2	Circular Economy	The Final Waste Option should support a transition to a circular economy that reflects natural systems and puts the wellbeing of Papatūānuku first.
3	Community Connection	The final waste disposal option enables and supports community connection and understanding of residual waste management, and is not a barrier to waste minimisation initiatives
4	Scalability	The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received.
5	Technical Maturity	Implementing a Final Waste Option that is already established will reduce the technical risks involved. Where a technology has had 10 or more successful uses it is likely to be well understood with suitable parts, operators and expertise. Any option that has been implemented in less than ten sites globally or is still in the research phase indicates that this process is novel and so presents a higher risk for Wellington City Council.
6	Time Frame	The consent for the Southern Landfill expires in June 2026 and as such the Final Waste Option will need to be constructed and operational before this date.
7	Local Community Effects	The Final Waste Option should minimise effects on the local community, including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area.
8	Environmental Effects (water)	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse effects to waterways and surrounding aquatic environments i.e. emissions to watercourses.
9	Environmental Effects (land)	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions and contamination to surrounding land.
10	Environmental Effects (air)	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions to air (including from transport) e.g. particulate or VOC emissions.
11	Consent and Planning	The Final Waste Option should have a strong likelihood of approval given existing policies, and alignment with central policy direction.
12	Value for money	The Final Waste Option should provide overall value for money for Wellington City ratepayers and ensures any financial investments takes into account intergenerational costs considerations

	Criteria	Description
13	Robustness/ Reliability	The Final Waste Option should be robust and reliable enough to handle changes in incoming waste content, and any equipment should be available and online for as close to 100% of its required operational hours as possible.
14	Size	The Final Waste Option should be able to fit within the existing site, or be able to integrate into existing waste network.
15	Resilience	The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations (e.g. earthquakes or other natural disasters). This will consider day-to-day waste transport corridors including whether the solution is based locally or outside the Wellington region
16	Te Ao Māori	The Final Waste Option should uphold Te Ao Māori and uphold the commitments of Te Tiriti o Waitangi, to ensure the protection of tapu, the wellbeing and restoration of Papatūānuku, and provide options which are suitable for the physical and cultural environment of Aotearoa. As part of this, a strong partnership with Mana Whenua must be embedded within the foundation of the option.

Multi-Criteria Analysis Findings

38. Beca Consulting have scored the four long listed options against the revised criteria. This process involved scoring each option using a spectrum of 1 to 10, with 1 being much worse than other options, and 10 being much better. Initially all the criteria were weighted equally, with each option having the potential to achieve up to 160 points. This equal weighting allows for an objective comparison across all the options.
39. As highlighted on Table 4, when using equal weightings for each of the criteria, the two landfill options both scored above the Energy from Waste option as well as landfill closure/waste export option. Of the two landfill options considered, the landfill redevelopment (Piggyback) option scored higher overall, highlighting that it performs strongest against the range of criteria considered.

40. **Table 4:** MCA Scoring Summary for Four Long Listed Options

	Criteria	Landfill Extension – Stage 4	Landfill Redevelopment (Piggyback) Option	Energy from Waste	Landfill Closure (and the associated export of waste)
1	<i>GHG Emissions</i>	3	5	7	3
2	<i>Circular Economy</i>	5	5	3	5
3	<i>Community Connection</i>	7	7	5	1
4	<i>Scalability</i>	10	10	3	10
5	<i>Technical Maturity</i>	10	10	7	10
6	<i>Time Frame</i>	7	10	3	10
7	<i>Local Community Effects</i>	3	5	7	10
8	<i>Environmental Effects (water)</i>	3	3	7	5
9	<i>Environmental Effects (land)</i>	3	3	7	3
10	<i>Environmental Effects (air)</i>	5	7	3	5
11	<i>Consent and Planning</i>	5	7	3	10
12	<i>Value for money</i>	7	10	5	1
13	<i>Robustness/ Reliability</i>	10	10	7	7
14	<i>Size</i>	10	10	10	10
15	<i>Resilience</i>	10	10	7	1
16	<i>Te Ao Māori</i>	5	7	3	1
	Score (Out of 160)	103	119	87	92

41. Beca Consulting additionally undertook a sensitivity analysis of each option against the criteria whereby different weightings were applied to the criteria to test the robustness of the preferred option. The following criteria were weighted more highly in the sensitivity testing:

- GHG Emissions
- Alignment with Te Ao Māori
- Scalability
- Environmental Emissions

- Resilience

42. The results of this analysis illustrated that the relative position of each disposal option stays relatively constant throughout the sensitivity testing process. Of the two local landfill options, the Piggyback redevelopment/expansion option consistently ranked ahead of the Stage 4 Expansion. Also, throughout all sensitivities, both local landfill expansion options consistently score higher than either Energy from Waste or Landfill Closure options. For details of the sensitivity weighting comparison please refer to **Appendix 2** (see Beca report p30, Table 13).

Short Listed Waste Disposal Options

43. In October 2021, the Infrastructure Committee noted that the Stage 4 landfill extension option may be a reasonably practicable option for dealing with residual waste disposal, and may need to be included as an option under a Special Consultative Process.
44. The Infrastructure Committee's note reflects the requirements of the Local Government Act 2002 to, in the course of decision-making, "seek to identify all reasonably practicable options for the achievement of the objective of a decision".
45. Due to the scale and potential for adverse effects associated with landfill extension or redevelopment, additional technical information was commissioned to determine the technical feasibility of each landfill option (refer to the Tonkin and Taylor reports contained in **Appendix 4 and 5**). These technical reports assess the potential resource consent risks and opportunities, as well as the constructability of both the Piggyback redevelopment and the Stage 4 landfill extension by 2026, being the lapse date of the current landfill consent.
46. Report findings highlight the increased complexity and challenges associated with consenting the Stage 4 Landfill extension option. Such challenges and complexity include the need for significant vegetation clearance in an area currently proposed for listing under the district plan as a Significant Natural Area (SNA) in order to undertake the Stage 4 extension. **Appendix 5** further notes the 6-year construction and planning time horizon required for the Stage 4 extension. The Stage 4 construction time horizon means that the landfill would not become operational until 2028, which is two years after the lapse date of the existing landfill consent.
47. As result of the high-level of uncertainty pertaining to the technical feasibility of the Stage 4 option, and due to the higher-level of confidence afforded by the alternate landfill Piggyback redevelopment option, the Stage 4 landfill extension is not deemed a reasonably practicable waste disposable solution for Wellington City. In contrast, the remaining waste disposal options are considered to remain technically feasible, albeit to varying degrees.
48. Therefore, the recommended short list of waste disposal options proposed for Committee consideration are limited to:
1. Landfill Closure and the associated export of waste to another disposal facility
 2. Landfill Redevelopment (Piggyback) Option
 3. Energy from Waste
49. An overview of the advantages and disadvantages of each option can be found in **Appendix 6**. For a summary of the costs of each short-listed options, see Table 5.

50. Table 5: High-Level Costs

Option	Capex (\$)	Opex (\$/per annum)	Notes/Other
Southern Landfill Redevelopment (Piggyback) Option	\$42.5 million	\$4 million	Opex cost are currently fully funded through landfill revenue. In 2021 landfill revenue was \$17 million (per annum). In 2021, landfill profit (after allocations) was approximately 1.4 million. Landfill profits should be anticipated to reduce overtime as landfill inputs reduce as a result of waste reduction.
Landfill Closure and the Export of Waste	N/A	\$6.7 million/per annum (Note-costs will vary subject to the gate fee at the final disposal facility)	Will result in a loss of Council landfill revenue (i.e. \$17 million per annum in 2021). Alternative funding required to support all current Council waste management and minimisation services is estimated to be \$6.7million (per annum). Preliminary estimates suggest that this has the potential to result in a 1.5% rates increase for residents). Current Council waste management and minimisation services includes: <ul style="list-style-type: none"> - Kerbside recycling services - Resource recovery centre and Tip Shop - Transfer station operations for domestic customers. - Green Waster Diversion and Composting operations - Waste minimisation staff to support existing waste minimisation activities
Waste to Energy	\$215 million	\$10.8 million	High Capital costs to construct and operate. Highly likely to require rates funding to support operations. Preliminary estimates suggest that this option has the potential to result in a 2.5% rates increase for residents).

Proposed Preferred Waste Disposal Option

51. In accordance with the findings of the Multi-Criteria Analysis Process, the Landfill Development (Piggyback) Option is recommended as the preferred waste disposal

option for Wellington City. In comparison to the other three options, within the MCA this option performs above other options in a number of categories, and in areas where the option does not fully meet the ranking criteria it still performs similarly to other options.

52. One of the main advantages of the Piggyback landfill option is that, of all the options it best enables WCC's waste diversion and recycling practices to be implemented, and would not inhibit a reduction of waste volumes over the life of the landfill. The limited volume of the landfill expansion will additionally provide an impetus for the establishment of supporting resource recovery infrastructure and/or waste diversion systems.
53. The Piggyback option can be implemented by 2026 and does not appear to have any significant consenting barriers. In addition, the Piggyback Expansion option would provide reasonable value for money and would not burden the Council or ratepayers with large increases in rates due to the relatively low capital cost to construct and low ongoing operational cost.
54. It is noted that this option was also generally supported by Working Party participants, which reflects its well-rounded performance against nominated assessment criteria.

Kōwhiringa

Options

55. The following short-listed residual waste disposal options are recommended to be progressed to public consultation as part of the Annual Plan consultation process (2022). These options include:
 1. Landfill Redevelopment (Piggyback) Option
 2. Landfill Closure and the associated export of waste to another disposal facility
 3. Energy from Waste
56. It is noted that any decision to not to progress the residual waste disposal options for public consultation, or to delay consultation of the residual waste disposal options until the next Annual Plan consultation in 2023, risks the temporary or permanent closure of the Southern Landfill in 2026. In turn, landfill closure would also necessitate the export of Wellington City's municipal waste to another landfill for disposal.

Whai whakaaro ki ngā whakataunga

Considerations for decision-making

Alignment with Council's strategies and policies

57. The waste minimisation focus of this report is consistent with the Council's intent as signalled in the Wellington Region Waste Management and Minimisation Plan (2017).

Engagement and Consultation

58. The landfill is a strategic asset and there are consultation requirements to meet our obligations under the Resource Management Act 1991 and the Local Government Act 2002.
59. As landfill closure has been deemed a reasonably practicable option for Council consideration, the Council are legally required to consult on the short-listed waste disposal options using the special consultative process provided in the LGA.

60. Subject to the Committee's acceptance of the recommended landfill disposal options for public consultation, a communications plan will be developed. This plan will integrate the consideration with other Annual Plan consultation considerations.

Implications for Māori

61. The Council are providing regular updates to Mana Whenua, specifically Taranaki Whanui and Ngati Toa Iwi. The Council will continue to be proactive in attempts to further engage Iwi, and will be responsive to any opportunity to kōrerorero with our Iwi partners should they arise prior to, during and/or following the proposed public consultation process.
62. The Council's decision on the final residual waste disposal solution for Wellington City has the potential to involve a significant decision in relation to land or a body of water. Therefore, the Council has a legal obligation to take into account the relationship of Māori and their culture and traditions with their ancestral land, water, sites, waahi tapu, valued flora and fauna, and other taonga, as noted in accordance with s77(c) of the LGA 2002.
63. As demonstrated by the revised criterion included within the MCA, it is recognised that the Final Waste Option should uphold Te Ao Māori and uphold the commitments of Te Tiriti o Waitangi, to ensure the protection of tapu, the wellbeing and restoration of Papatūānuku, and provide options which are suitable for the physical and cultural environment of Aotearoa. As part of this, a strong partnership with Mana Whenua must be embedded within the foundation of the option.

Financial implications

64. An overview of the estimated financial implications for each option is detailed in Table 5 of this report.

Legal considerations

65. The legal consultation requirements are set out in the report.

Risks and mitigations

66. Risks are outlined in the report.

Disability and accessibility impact

67. At this stage there are no disability and accessibility impacts.

Climate Change impact and considerations

68. For a comparison of the potential embodied emissions and operational carbon impacts from each of the three short listed options, see tables 6 and 7 below. For a detailed carbon assessment for these options, see Appendix 2 (see Beca report Appendix D).
69. **Table 6:** Embodied Emissions Summary

Option	Base Embodied Emissions (tCO ₂ e)	Embodied Carbon for Expansion of Regional Landfill Infrastructure (tCO ₂ e)	Total Embodied Carbon (tCO ₂ e)
Landfill Extension	12,300 – 20,700	0	12,300 - 20700
Energy from Waste (EfW) facility	34,200 – 57,700	4,800 – 8,100	39,000 – 65,800
Waste Export	0	12,300 – 20,700	12,300 – 20,700

tCO₂e = tonnes of CO₂ equivalent

70. Within Table 6, ‘embodied emissions’ refers to the emissions associated with construction a waste facility, and expanding offsite landfills to cope with the residual wastes from the facility as well as incompatible wastes generated in Wellington City. Table 6 highlights that in terms of embodied emissions, the landfill (Piggyback) redevelopment option performs equal to landfill closure/waste export. In this scenario, Waste to Energy has the highest level of embodied emissions, which is likely due to the significant amounts of concrete and steel that would be required to construct such a facility.
71. In contrast, there is very little difference in between the level of operational carbon emissions between the three options. Energy to waste (EfW) has the least operational emissions as the electricity produced can offset carbon used to extract and supply fossil fuels to other power plants in the national grid. In New Zealand, 80% of the electric generated is generated by fossil fuels. Landfill extension and the Waste Export options have similar levels of operational carbon emissions, with the waste export option being slightly higher to account for the additional distance waste needs to travel from Wellington to its final destination.
72. While it may seem counter-intuitive, in all the options, the largest contributor to operational carbon emissions is the amount of waste that either decomposes in a landfill or is incinerated in a WtE. In summary, reducing the amount of residual waste produced is the best way to reduce carbon emissions irrespective of the residual waste disposal option.
73. **Table 7:** Annual Operational Carbon Emissions Summary

Option	Annual Net Operational Emissions (tCO ₂ e/yr)
Landfill Extension	23,000
Energy from Waste (EfW) facility	22,400
Waste Export	23,200

Communications Plan

74. A Communications Plan will be drafted following consideration of this report.

Health and Safety Impact considered

75. While waste is an area with specific health and safety needs, there are no health and safety impacts directly attributed to the content of this report. Health and safety will







be further considered following the Council's decision on the final residual waste disposal solution for Wellington City.

Ngā mahinga e whai ake nei

Next actions

76. The next step is for the Council is to approve the following short list of potential residual waste disposal options for public consultation in conjunction with the Annual Plan:
 - i. Landfill Redevelopment (Piggyback Option)
 - ii. Landfill Closure and the associated export of waste to another disposal facility
 - iii. Energy from Waste
77. Consultation must be undertaken in accordance with the Special Consultative Procedure as set out by the Local Government Act 2002, to enable a decision to be made within the Long-term Plan.

Attachments

- Attachment 1. Airspace Projections for the Southern Landfill 
- Attachment 2. Final Waste Management Option Assessment for Wellington City Council (by Beca Consulting dated 27.01.2022) 
- Attachment 3. Revised Criteria with associated Working Party Input (by Beca Consulting) 
- Attachment 4. Southern Landfill: Piggyback Option & SLS4 (by Tonkin and Taylor dated December 2021) 
- Attachment 5. Southern Landfill Piggyback Option (by Tonkin and Taylor dated January 2022) 
- Attachment 6. Advantages and Disadvantages of the Short-listed Residual Waste Disposal Options 

Appendix 1: Airspace Projections for the Southern Landfill

The Southern Landfill currently has adequate airspace to fill before the respective resource consent expires in 2026.

As highlighted in Table 1, based on historical airspace consumption trends, and assuming normal business circumstances, air space capacity at the Southern Landfill is likely to reach the expiry date of the resource consent in 2026. However, airspace capacity constraints are projected to inhibit the operation of the existing landfill site at the Southern Landfill beyond June 2026. At this point, an alternative waste disposal solution will be required by Wellington City Council.

Table 1: **Southern Landfill Airspace Consumption Projections**

Year ending	Airspace Consumed (m3)	Airspace Remaining (m3)
June 2016	115,982 (Actual)	664,018
June 2017	118,488 (Actual)	545,530
June 2018	92,400 (Actual)	453,130
June 2019	98,190 (Actual)	354,940 + 250,000* = 607,446
June 2020	90,446 (Actual)	517,000
June 2021	90,620 (Actual)	426,384+ 15,000** = 441,384
June 2022***	90,394*** (Predicted)	350,990
June 2023***	90,167*** (Predicted)	260,823
June 2024***	89,950*** (Predicted)	170,873
June 2025***	89,720*** (Predicted)	81,153
June 2026***	89,500*** (Predicted)	-8,347 (shortfall)

*250,000 m³ of extra airspace was created by Waste Ops by increasing the height of the toe bund as part of the construction of the toe bund to establish a new tipping area.

**15,000 m³ of extra airspace was created through the extraction of rock at the tip face for construction of a new road to access the valley beyond the toe bund.

*** Waste Operations commissioned a new purpose-built machine to apply alternative daily cover instead of earth cover saving airspace further; operational in Jan 2022. Conservatively, we will be saving 5% annual airspace assuming a 50% application rate.

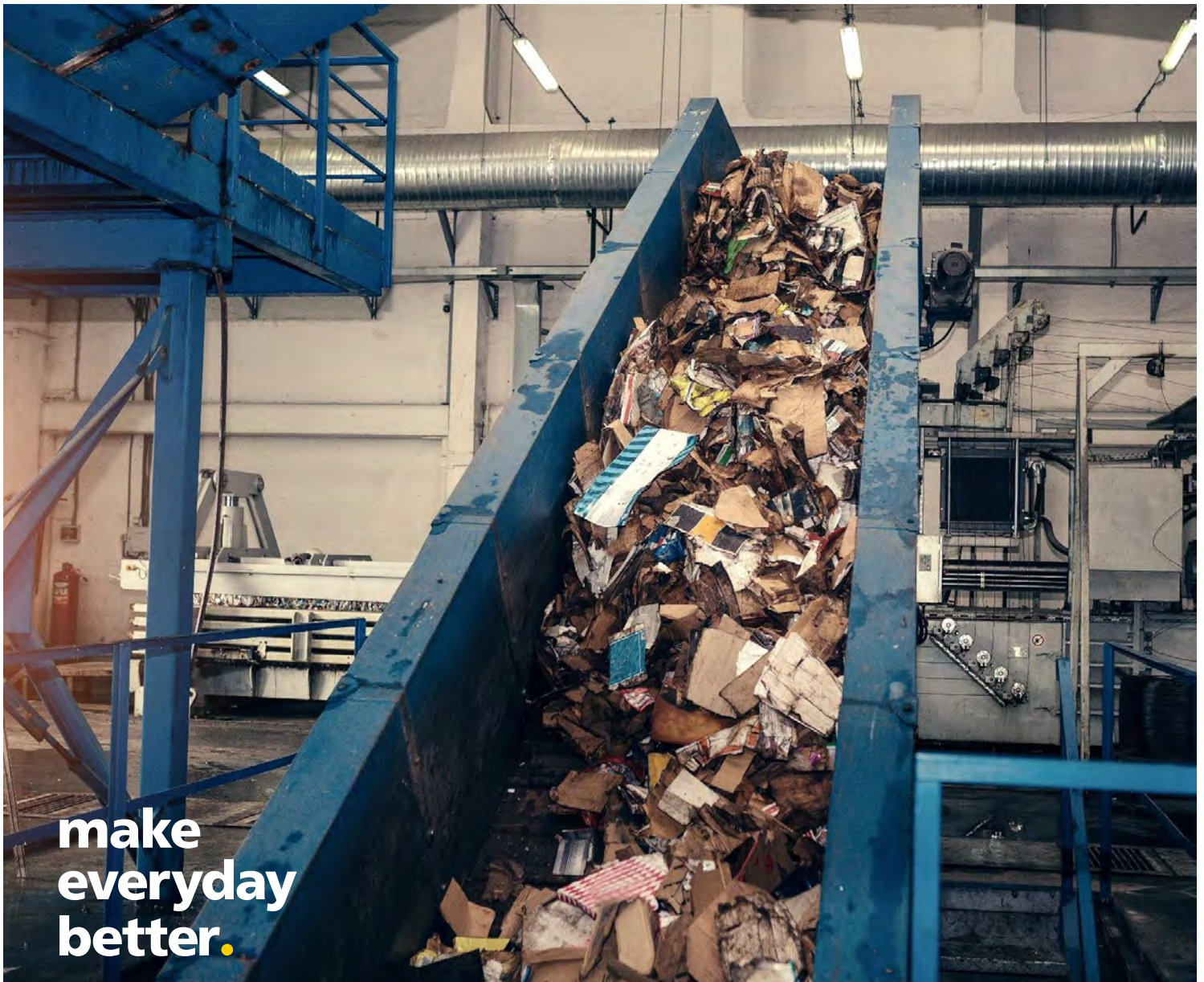
Notes:

- Actual airspace consumed is based on historical surveys.
- Predicted airspace consumed is based on average consumption with a 5% growth factor and then discounting 5% from airspace savings by using ADC.
- These numbers also do not consider settlement of waste as waste biodegrades.

Final Waste Management Option Assessment for Wellington City Council

Prepared for Wellington City Council
Prepared by Beca Limited

27 January 2022



**make
everyday
better.**

Revision History

Revision N°	Prepared By	Description	Date
A	Jack Timings	Draft for Approval	27/01/2022

Document Acceptance

Action	Name	Signed	Date
Prepared by	Jack Timings		27/01/2022
Reviewed by	Eleanor Grant		27/01/2022
Approved by	Nathan Baker		27/01/2022
on behalf of	Beca Limited		

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Appendix C – Summary of Stakeholder Feedback

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Executive Summary

Introduction

The Wellington City Council (WCC) owns and manages the Southern Landfill. The landfill is considered key infrastructure for the city, and is listed as a strategic asset in WCC's Significance and Engagement Policy, as required under the Local Government Act 2002 (LGA). The landfill operates under a resource consent issued by the Greater Wellington Regional Council.

The landfill's consent expires in June 2026, and is projected to reach current consented capacity at the same time. Therefore, WCC is assessing the possibilities presented by alternative waste management technologies to manage Wellington city's residual waste (i.e. all mixed wastes disposed to landfill in Wellington City from households, businesses and other sources like special and contaminated wastes). This assessment needs to show how the adoption of alternative waste management solutions could align with its objectives and responsibility to handle and process waste generated in the Wellington City and also align with its aims to promote a more sustainable, circular operation aligned with Te Ao Māori.

Beca and Fichtner were engaged by WCC in 2021 to perform a technical and suitability assessment of a long list of possible residual waste management solutions (including extension of the current landfill) for WCC to implement post-2026, and evaluate the relative advantages and disadvantages of applying each technology in a WCC context.

After the original report was delivered to WCC in late 2021, Beca was engaged by WCC to produce an updated assessment of technologies specifically targeting post-recovery residual waste, referred to in this report as final waste options. The key difference between these two types of waste solutions is that options that extract and divert or minimise wastes prior to the final waste being sent to another location are not final waste options, since they are an intermediate step before the residual waste is finally sent somewhere else.

This involved removing many of the options originally identified as alternatives to landfilling from the analysis, such as Autoclaves or Materials Recovery Facilities (MRFs). This reframing of the assessment significantly affected the intentions and methodology of the previous assessment and necessitated the process be repeated with revised criteria and a revised list of options for consideration.

Wellington's Waste Requirements and Reduction Initiatives

The landfill currently receives 60,000 tonnes of municipal solid waste (MSW) and 15,000 tonnes of Sewage Sludge from the city's sewage treatment plant per annum. It also serves as a location for the disposal of contaminated soil and asbestos contaminated material generated from development activity within the city.

There are very few alternatives to landfilling the contaminated soil and asbestos-containing waste that the landfill receives, which confirms that some waste will always be required to be landfilled, but over 60% of the waste received by WCC (domestic waste, commercial waste, sludge solids) could be processed using different technologies. In parallel to an assessment of options for its residual waste WCC is also undertaking work to establish their future strategic waste minimisation infrastructure and investment requirements, and to review their existing Waste Management and Minimisation Plan.

Despite the Council’s scope to support waste minimisation and resource recovery within Wellington City over the next 15 years, estimates suggest that there will still be approximately 34,000 tonnes of municipal waste generated by Wellington City in 2036. In addition to this municipal waste, the Council can also anticipate the ongoing need for the disposal of asbestos and contaminated soil, increases of waste disposal resulting from population growth and/or GDP growth, and possible increases in construction and demolition waste as the City’s construction programme steadily increases over the next decade.

Option Scoring and Evaluation Process

Four final waste options were raised as suitable options for Wellington City Council to assess in more detail. These were:

1. Stage IV Landfill Extension
2. Piggyback Landfill Extension
3. Energy from Waste
4. Waste Export.

As part of this reassessment, a Multi Criteria Assessment (MCA) process was constructed and iterated with input on the criteria and their relative importance collected during community stakeholder workshops. The final MCA scored the four identified options against sixteen individual criteria. The results of this scoring process can be seen below:

Evaluation Process Results

Table 1: MCA Scoring Summary for Four Options

	Criteria	Stage IV Landfill Expansion	Piggyback Expansion	Energy from Waste	Export (No collection)
1	<i>GHG Emissions</i>	3	5	7	3
2	<i>Circular Economy</i>	5	5	3	5
3	<i>Community Connection</i>	7	7	5	1
4	<i>Scalability</i>	10	10	3	10
5	<i>Technical Maturity</i>	10	10	7	10
6	<i>Time Frame</i>	7	10	3	10
7	<i>Local Community Effects</i>	3	5	7	10
8	<i>Environmental Effects (water)</i>	3	3	7	5
9	<i>Environmental Effects (land)</i>	3	3	7	3
10	<i>Environmental Effects (air)</i>	5	7	3	5

	Criteria	Stage IV Landfill Expansion	Piggyback Expansion	Energy from Waste	Export (No collection)
11	<i>Consent and Planning</i>	5	7	3	10
12	<i>Value for money</i>	7	10	5	1
13	<i>Robustness/ Reliability</i>	10	10	7	7
14	<i>Size</i>	10	10	10	10
15	<i>Resilience</i>	10	10	7	1
16	<i>Te Ao Māori</i>	5	7	3	1
Score (Out of 160)		103	119	87	92

Based on this scoring, the two landfill extension options both score above the Energy from Waste option as well as waste export. Of the two landfill options considered, the Piggyback expansion scores highest overall showing that it performs strongest again the range of criteria considered.

A description of the criteria definitions can be found in Section 3.3, and further technical descriptions of the options can be found in Section 4.

Detailed Analysis of Final Waste Options

These four technologies all have relative advantages and disadvantages considering social, cultural and financial impacts of the options, and should be carefully assessed against each other to decide on an appropriate solution for WCC to adopt.

Table 2: Final Waste Option Summary

Waste Technology	Waste Treated	Residual Waste (not treated)	Capex (\$NZD)	Opex (NZD/year)	Social / Env Impacts
Stage IV Landfill Expansion	All waste	N/A	\$111M	\$3.68M	Reclamation of 2km of stream and some loss of natural habitat
Piggyback Landfill Extension	All waste	N/A	\$33.6M	\$3.68M	No reclamation of stream and smaller loss of natural habitat.
Energy from Waste (EfW)	Combustible Waste from Domestic, Commercial and WWTP Sludge	Non-combustible wastes, Contaminated Soil and Special Waste	\$214M	\$4.99M + \$9.7M for offsite disposal of Residual Waste streams	Increased particulate emissions, reduced land/water emissions, generation of energy/ash products.
Waste Export	All waste	N/A	\$0	\$27.8M	Impacts relocated outside of Wellington City

With the Energy from Waste plant, a portion of the waste is required to be sent to landfill and cannot be treated, and a portion of the waste that is treated (usually 3% but up to 20% if a market cannot be found for bottom ash material use in construction) still requires landfilling post-treatment. This means that alternatives to landfilling still need to consider how residual and treated wastes need to be handled, and whether there are advantages to co-locating this facility on a landfill should be considered.

Preferred Option from Analysis

Based on the results of this assessment process, the option identified as the preferred option for Wellington City's final waste management is the Piggyback Landfill Expansion. This option leads in a number of categories, and in areas where the option does not fully meet the ranking criteria it still performs similarly to other options. Its total score of 7.4 out of 10 available points (119 out of 160) is a full point ahead of the next nearest option (Stage IV landfill extension with 6.4 out of 10), and its position at the top of the list is repeated in each of our sensitivity tests.

One of the advantages of the Piggyback landfill is that it aligns with WCC's intentions to increase waste diversion and recycling practices, and reduce final waste volumes over the time period that the Piggyback landfill would be operational. Providing a flexible end location for different kinds of waste over time would enable development and implementation of circular economies for different kinds of materials (organic wastes, plastics, glass etc.) when feasible.

The option is one of few that would be readily implementable within the required timeframe, and would not pose any large barriers to consenting. In addition, the Piggyback Expansion option provides reasonable value for money due to the relatively low capital cost to construct and low ongoing operational cost.

This option was also supported by Community Stakeholder groups which reflects its well-rounded performance against nominated assessment criteria.

Next Steps

The next step for Wellington City Council will be to assess the options to determine what is practical to implement within the identified timeframe.

After this process is complete, the Council will be responsible for further refinement of the list of final waste options as required, after which the Council will consider the merits of the final short list of options and advance Council decision making in accordance with legislative requirements.

1 Introduction and Context

The Wellington City Council (WCC) owns and manages the Southern Landfill. It is considered a key infrastructure for the city, and is listed as a strategic asset in WCC's Significance and Engagement Policy, as required under the Local Government Act 2002 (LGA). The landfill operates under a resource consent issued by the Greater Wellington Regional Council.

The landfill currently receives 60,000 tonnes of municipal solid waste (MSW) and 15,000 tonnes of Sewage Sludge from the city's sewage treatment plant per annum. It also serves as a location for the disposal of contaminated soil and asbestos contaminated material generated from development activity within the city.

Currently, all landfill fees are used to offset the cost of waste collection and disposal services, recycling collection and processing services and waste minimisation activities. No additional funding from rates is required.

With the current landfill consent expiring in April 2026, and landfill disposal capacity expected to be reached at the same time, WCC is assessing the possibilities presented by alternative waste management technologies after the current consent expires. WCC wishes to assess how the adoption of other options could align with its charter to handle and process waste generated in Wellington City, and also align with its aims to promote a more sustainable, circular operation aligned with Te Ao Māori. In addition the technology needs to be compatible with the long term needs for the disposal of waste in the Wellington City.

1.1 Original Assessment

Beca and Fichtner were engaged by WCC to perform a technical and suitability assessment of a long list of possible waste technology options for WCC to implement post-2026, and evaluate the relative advantages and disadvantages of applying each technology in a WCC context.

After the long list waste options had been assessed at a high-level and the best options identified, a more detailed comparative assessment for the four technologies best suited to WCC and wider Wellington region's requirements was performed. This information could then be used by WCC to develop a public engagement process and establish a residual waste disposal solution for the city.

1.1.1 Underpinning the Assessment Process with a Māori World View

A key aim for Wellington City Council was to underpin the decision making process with consideration of their obligations to the people and environment within Wellington City, and apply a Māori World View when evaluating the benefits and limitations of different options. This directed their selection process to encompass many criteria above and beyond technical and economic benefits, including:

- Their responsibilities as kaitiaki of the proposed development site and surrounding waterways, environment and communities;
- Whether the technology being assessed aligned with their Te Atakura First to Zero plan to reduce the climate change impacts of Wellington City Council's operations; and
- Whether implementation of each technology would promote more regenerative and circular management of waste products, and support the development of more sustainable waste management practices.

1.2 Revised Focus of Assessment Process

In October of 2021, the initial assessment of possible options for residual waste treatment in Wellington City was completed, and a report published to support public consultation on the shortlisted options.

Following this evaluation process, WCC requested an updated assessment of technologies specifically targeting post-recovery residual waste i.e. removing many of the options originally identified as alternatives

to landfilling from the analysis. As understood by Beca, the refined focus on waste disposal solutions was as a result of the consideration of potentially appropriate resource recovery technologies being referred to the WCC resource recovery business case development process scheduled for early 2022. To reduce overlap between these two separate processes, a focus on final waste disposal options was used to direct the revised assessment process.

This reframing of the assessment significantly affected the intentions and methodology of the previous assessment and necessitated the process be repeated with revised criteria and a revised list of options for consideration.

Please refer to the two sections following for an explanation of the change in focus between the original report and the updated analysis:

1.2.1 Original Focus of Future Waste Option Assessment

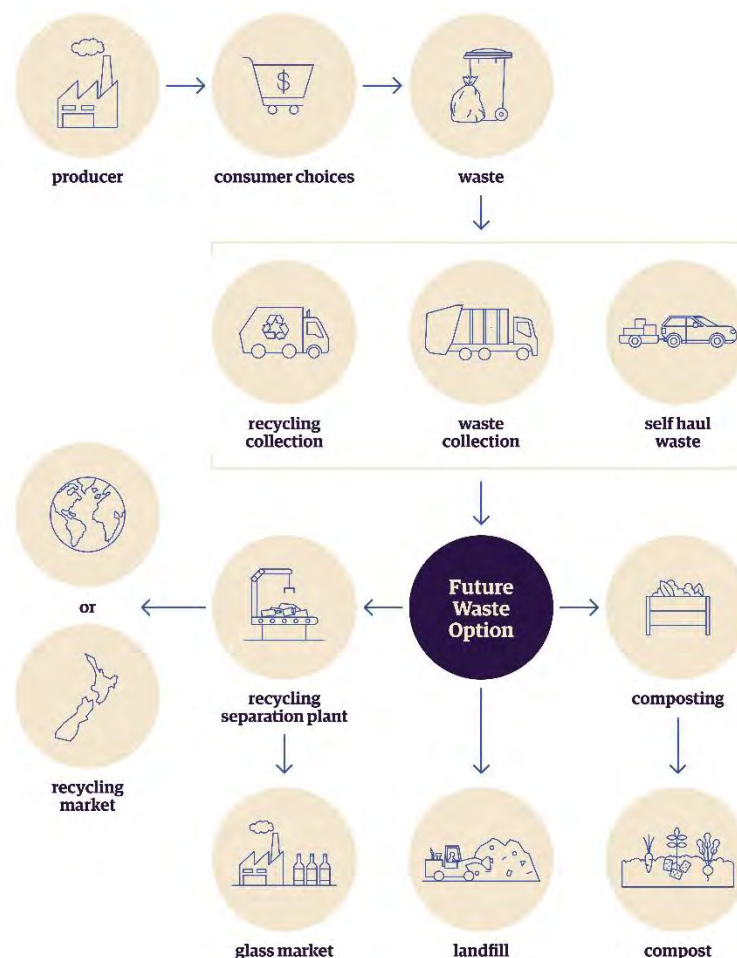


Figure 1: Original Focus of Assessment, and Definition of Future Waste Option

The diagram above illustrates the focus of the original analysis, defining the “Future Waste Option” as an interface between Waste Collection and final waste processing activities i.e. recycling, compost or landfill in the context of Wellington City’s current waste cycle. By this definition, the Waste Option could be either a downstream waste minimisation facility like a Materials Recycling Facility (MRF) or an Anaerobic Digestion (AD) plant, or could be a waste disposal/treatment facility like a landfill or Energy from Waste (EfW) facility.

1.2.2 Updated Focus of Final Waste Option Assessment

To decouple the need for minimisation initiatives as part of WCC’s redesign of its waste system, from the need to manage and handle final residual wastes, the waste cycle diagram has been re-drawn as below. This reframes the Final waste solution as the final step in residual waste treatment following consumer waste minimisation, collection and residual waste treatment:

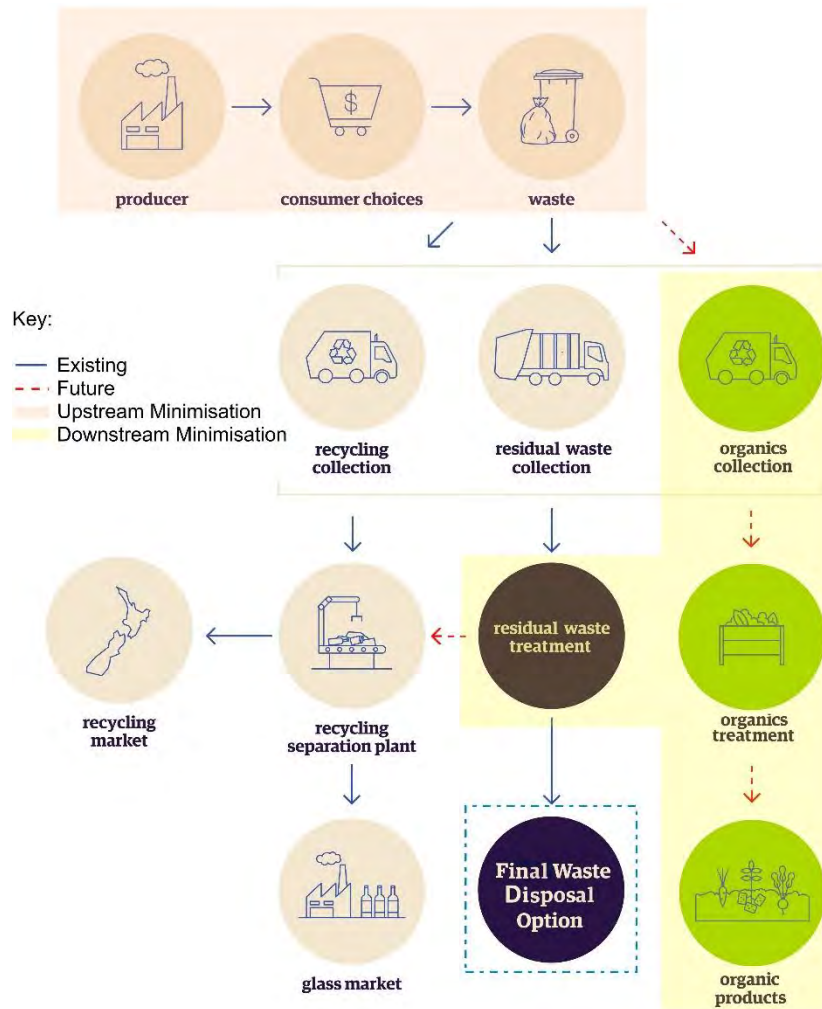


Figure 2: Revised Focus of Assessment and Definition of Final Waste Disposal Option

This redefining of the focus of this assessment to the consideration of potential final waste disposal solutions for Wellington City Council removed a large number of potential options from the long list and focused the assessment on technologies that could process low-quality residual waste streams that was likely to decrease over time in quantity (given separate development of waste diversion and minimisation initiatives).

1.2.3 WMMP Process

Connected to the focus of this study i.e. the selection of a preferred option for handling residual waste generated in Wellington City is the Wellington Region Waste Management and Minimisation Plan (WMMP). The existing WMMP will remain the Council’s operative WMMP until it is revised in 2023.

As per WCC's December Strategic Waste Planning Overview Report, "While the strategic waste projects scheduled for 2022 have the potential to help contribute to the achieve of this waste reduction potential, it is evident that there will still be a need to dispose of waste generated from Wellington City for the foreseeable future."

Officers estimate that there is potential to reduce the amount of municipal¹ solid waste tonnages entering the Southern landfill by half over the next 15 years. However, this waste reduction potential remains primarily contingent on:

- The removal of sewerage sludge from the landfill
- The removal of organic waste from landfill
- The extent, timing and implementation of comprehensive product stewardship and behaviour change programme being implemented by Central Government.

The Council will be advancing work to investigate a range of resource recovery options, including organic waste processing technologies in 2022. This work is being undertaken in line with the existing WMMP (2017-23).

1.3 Stakeholder Engagement

As part of this reassessment process, WCC and Beca facilitated a series of community stakeholder engagement workshops to update the original assessment process. The stakeholder workshop group included local residents associations, waste advocacy groups and industry participants, and resulted in the review of the focus of the assessment, adjust the original MCA assessment criteria based on their feedback and collect any additional options for consideration.

More details on these stakeholder workshops, feedback collected and resulting modifications to the MCA Assessment criteria can be found in Section 3.2.

2 Waste Characteristics

The waste received by WCC at the Southern Landfill comes from a variety of different sources and contains multiple streams with different components. A summary of these is below:

Table 3: Landfilled Waste Characteristics

Stream	Category	Tonnage (average of prev. 3 yrs)	Approx %	Information
A	Domestic to Transfer Station	8383	9%	This is general waste received at our transfer station - usually residential customers
B	Mixed Commercial	55874	58%	This is generally mixed commercial tonnages
C	Sludge/Screenings to Tip Face	14286	15%	De-watered sludge
D	Special Waste	17750	18%	Other types of unusual waste (approval upon application) - generally Asbestos contaminated material

¹ Not inclusive of asbestos waste, contaminated soil or C&D waste which is expected to increase. Much of Wellington's C&D waste is disposed of at private facilities.

Separate from the waste that is landfilled onsite, the site also receives contaminated soil which is placed into dry cells instead of being mixed and landfilled with the other waste streams:

Stream	Category	Tonnage (average of prev. 3 yrs)	Information
E	Contaminated Soil	28297	This material linked to the amount of construction activity in the city - material uncovered is generally one-off - once contaminated material is gone; it is not reproduced

As seen in the tables above, around 37% of the total waste received is contaminated soil and special waste (generally asbestos-containing material) which fluctuates depending on construction activity in the city, and just over half of the total waste is mixed commercial and domestic wastes. Wastewater treatment sludges make up 11% of the total waste received and 18% of landfilled waste, but this is expected to decrease in coming years. WCC has consulted, via the Long Term Plan, on options for treatment of sludge, which will have the likely result of reducing the amount of sludge that will be required to be landfilled. A preferred solution has been identified, and funding is currently being sought for new infrastructure to support this.

Waste treatment solutions are limited for streams D and E, due to the hazardous nature of these wastes. These streams cannot be processed to remove contaminants or recycled without extremely careful processing, so it is realistic to assume that for the foreseeable future these streams will need to continue being disposed of in sealed, well-managed landfills.

However for other streams (especially streams A and B), there are a number of alternatives to landfilling.

2.1 Characteristics of Streams A and B

Streams A and B (domestic and commercial waste) contain a mixture of organic and non-organic wastes, approximately distributes as below:

Table 4: A and B Stream Components

Waste Category	A + B Tonnage	A + B %
Paper	6118	10%
Plastics	7611	13%
Organics	22804	39%
Ferrous Metals	1683	3%
Non-ferrous Metals	663	1%
Glass	1720	3%
Textiles	4769	8%
Sanitary paper	4367	7%
Timber	8608	15%

The largest components of this waste are organics (39%), timber (15%), plastics (13%) and paper + sanitary paper (10% and 7% respectively). Many of these waste streams are potentially recyclable or can be processed in other ways. Additionally, many of these streams strongly contribute to emissions from the landfill as they decompose into methane and carbon dioxide under anaerobic conditions in sealed landfill cells.

2.2 Waste Volume Projections over Time

2.2.1 Wellington Region Waste Management and Minimisation Plan

In 2017, WCC collaborated with other councils in the Wellington Region to produce a ten-year plan for aligning waste reduction targets and initiatives across councils in the wider Wellington area.

As part of this project, a Joint Governance Committee was established with members from each council to oversee the development and implementation of the regional Waste Management and Minimisation Plan. The key aim of this plan was to reduce the quantity of waste sent to class 1 landfills by 50%; from 600 to 400 kilograms per person per year by 2026, which approximately lines up with the expiry of WCC's current landfill consent. The key actions identified to implement this plan include:

- Developing and implementing consistent waste bylaws
- Investigate a region-wide resource recovery network
- Develop more consistent and effective forms of communication and education on waste services and waste minimisation
- Collaborate with external parties to undertake research, lobbying and other actions on e-waste, product stewardship and other waste management issues.

2.2.2 Impact of Waste Reduction Projects over Time

a. Wellington Water Sludge Minimisation Project

Waste Stream C, or sludge material from the local municipal wastewater treatment plant, is expected to decline in future years as Wellington Water implements a preferred solution to decrease material needing to be landfilled from its water treatment plant. The preferred technological solution for this is a new thermal hydrolysis and digestion plant, which would decrease the amount of WWTP sludge generated by the plant by 82%, and could also divert this material from being landfilled. To this end, Stream C is likely to significantly decrease in volume after completion of the identified projects.

In the past, WCC has composted WWTP sludge material as part of its previous landfill volume minimisation projects. However, this processing operation led to odour issues at the current landfill site and was discontinued.

b. Other Waste Minimisation Projects

WCC is in the process implementing a number of projects that will shape the way waste is managed and generated in Wellington City:

- WCC is in the process of reviewing their WMMP, and investigating the strategic direction for resource recovery within the City;
- Costs for disposal of waste to landfill are being increased to disincentivise landfilling;
- The new Solid Waste Management & Minimisation Bylaw 2020 has come into effect, with new requirements to separate different types of waste, restricting the proportion of green waste in Council bags and requiring contractors to create construction/demolition waste plans etc
- WCC are also investing in behavioural change initiatives to divert recyclable and reusable materials from landfill.

It is difficult to directly estimate the size of the reductions associated by these initiatives and other future initiatives, but it reinforces the importance of selecting a Final Waste Option that can handle varying quantities of waste.

2.2.3 Impact of Population Growth over Time

The population of Wellington city is expected to increase by 50,000 to 80,000 people over the next 30 years. From data received in the GWRC Compliance Report for Southern Landfill, commercial and industrial waste

volumes to the landfill have remained fairly consistent over the last five years even when considering the population growth in the city during this time period. With current and future waste reduction projects, it is reasonable to expect this trend to continue as a minimum.

3 Multi Criteria Assessment Process

As part of this reassessment, the Multi Criteria Assessment process was workshopped and modified with input collected during community stakeholder workshops. Below the initial MCA assessment process is summarised, and modifications are detailed. For more information on the initial MCA Assessment process and the outcomes of the original study, please refer to the previously completed Future Waste Management Options report, dated October 2021.

3.1 Original MCA Criteria

A two stage evaluation process was used to assess potential options and score their suitability. This included completing an initial 'absolute criteria' assessment on a long list of options before scoring against a wider range of objectives.

These options were assessed in a process summarised in Figure 3 and explained below.

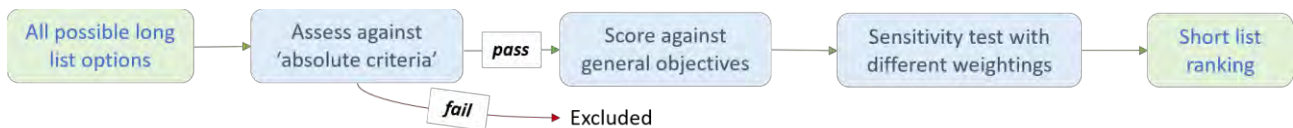


Figure 3: Assessment Process Summary

3.1.1 Absolute criteria

Three 'absolute criteria' were developed as bottom-lines for option inclusion, namely; technical maturity, programme and scalability. These were informed by what WCC considered to be fundamental to the aims of the project and so were included as a first check for inclusion of any technology. Technologies that did not align with any of the absolute criteria were not investigated further because:

- If the technology is not mature or well-established it could not be relied on to be a resilient solution for Wellington.
- Technology would not be fit for purpose if it were not fully operational by the time the Southern Landfill reaches capacity or before June 2026; whichever occurs first.
- Technology must be able to adjust for future tonnage or composition shifts as Wellington's needs change.

These three objectives align with Wellington City Council's mission to provide a future-proofed solution for Wellington's waste.

3.1.2 General objectives

For those options that passed the absolute criteria, they were then be scored against the general objectives developed by Beca and WCC. These objectives reflected the outcomes wanted by WCC alongside the considerations required under the Local Government Act 2002 and Resource Management Act 1991.

In general, the below measurable Criteria work together to accomplish three main overall Objectives:

- Minimise the effects of the waste management technology on the surrounding community and environment, including odour and air, water, land pollution as well as social impacts like noise and traffic
- Provide a proven, sensible and fiscally-responsible method for managing waste created in the Wellington region

- Align with WCC's future vision for Wellington City, where sustainable and regenerative economies are encouraged and the city transitions to net zero emissions by 2050 in line with science-based emissions reduction targets.
- Please see Table 5 below for a summary of these original criteria:

Table 5: Assessment Criteria and Project Objectives from Original Assessment (2021)

Criteria	Rationale/Description
Local Community Effects	<ul style="list-style-type: none"> Including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area Part of consenting process to avoid/minimise/mitigate adverse effects
Environmental Effects (water)	<ul style="list-style-type: none"> Emissions to watercourses Part of consenting process to avoid/minimise/mitigate adverse effects
Environmental Effects (land)	<ul style="list-style-type: none"> Emissions to land Part of consenting process to avoid/minimise/mitigate adverse effects
Environmental Effects (air)	<ul style="list-style-type: none"> Emissions to air (including from transport) Part of consenting process to avoid/minimise/mitigate adverse effects
Alignment with Circular Economy	<ul style="list-style-type: none"> Whether options contribute to a circular economy model
Alignment with Te Atakura First to Zero	<ul style="list-style-type: none"> Te Atakura First to Zero is WCC's blueprint for reducing emissions produced in Wellington City to zero by 2050 As such, consideration of the greenhouse gas emissions from waste for each option
Consenting and Planning	<ul style="list-style-type: none"> Likelihood of approval given existing policies Track record for similar consents in NZ
Value for Money	<ul style="list-style-type: none"> Total cost over project life including capex, opex, and revenues (e.g. electricity, heat, recycled products, etc.)
Robustness/ Reliability	<ul style="list-style-type: none"> Operational management requirements Availability of equipment
Maturity of Offtake markets	<ul style="list-style-type: none"> Whether there is an existing mature market for this technology in NZ, a market in development in some areas of New Zealand/mature market overseas or if it is a new/unknown market both overseas and in New Zealand.
Size	<ul style="list-style-type: none"> Whether options fits within the existing site.
Resilience	<ul style="list-style-type: none"> The resilience for day-to-day waste transport corridors including whether the solution is based locally or outside the Wellington region

The long list was initially scored by Beca and Fichtner before a workshop was held with WCC to test the analysis used. Scores were supported using international best practise knowledge as well as an understanding of the applicability of each technology in a New Zealand context.

3.2 MCA Workshop Process with Community Stakeholder Groups

After submission of the original study to council, it was recommended that the MCA Criteria and option selection process be reviewed in collaboration with a group of Community Stakeholder groups. This collaborative process involved a series of workshops over November and December of 2021 to:

- Define and discuss the scope and objectives of the MCA Assessment process;
- Review the design and format of the MCA Assessment process and criteria used in the assessment; and

- Re-examine the list of options to be evaluated.

These workshops were organised by Wellington City Council and facilitated by Beca in-person and online for those that could not attend in-person due to COVID-19 travel restrictions etc.

3.2.1 Attendees

The workshops were attended by a number of community interest groups, including:

- Owhiro bay Residents Association;
- Zero Waste Network;
- Greater Brooklyn Residents Association;
- Waste Free Wellington;
- Pare Kore;
- Friends of Owhiro Stream;
- Zealandia;
- EnviroWaste Wellington;
- Waste Management.

3.2.2 First Workshop

The first workshop was held on the 18th of November 2021 at Wellington City Council facilities at 113 The Terrace, Wellington. As part of the workshop, Beca facilitated a discussion between the parties in attendance on the original report and the aims and objectives of the original study, as well as the assessment process used to evaluate options for WCC's final waste management. The working group then gave feedback on the nature of the initial assessment and the structure of the MCA process employed by Beca and Fichtner to compare the options.

A full copy of the minutes of this discussion is available in Appendix A.

3.2.3 Second Workshop

The second workshop was held on the 14th of December 2021 at Wellington City Council facilities at 113 The Terrace, Wellington. As part of the workshop, Beca facilitated a discussion between the parties in attendance on a number of topics, including:

- The focus of this assessment in the context of Wellington's WMMP and overall waste management roadmap;
- Options being considered as part of this assessment process;
- Timeline for following consultation process and sensitivities surround existing landfill consent timelines.

Following this discussion, workshop participants took part in a criteria feedback exercise, to evaluate that the existing criteria were fit for purpose, and highlight any gaps to be filled in the next round of analysis.

A full copy of the minutes of this discussion is available in Appendix B.

3.2.4 Follow-up Survey

To close out remaining actions from the second workshop, an online survey was submitted to workshop participants to collect additional feedback.

The survey was designed to collect feedback on three topics:

- The wording of existing criteria;
- Any additional criteria that should be included;
- Which criteria are most critical to success of the final waste option; and
- Any additional options that should be considered as part of the analysis.

A full copy of all submissions received and actioned changes to the MCA criteria list can be viewed in Appendix C.

3.3 Results of Stakeholder Engagement Process

After completion of the workshops and feedback gathering phase of the study, the input from community stakeholders was summarised and key themes were incorporated into the revised MCA process.

3.3.1 Updated MCA Structure

After conclusion of the stakeholder workshops, the two-phased approach used to pre-select options and then score them was removed. To avoid biasing the assessment towards more proven technologies and to streamline the overall assessment, the three non-negotiable criteria were added to the long list of assessment criteria where options would be scored out of 10 for these three points rather than being given a pass/fail rating.

3.3.2 Updated MCA Criteria

Following collection and review of Community Stakeholder feedback, the final criteria were redefined and used to evaluate the final waste options. Please see below for the final criteria list:

Table 6: Updated MCA Criteria List with Definitions

	Criteria	Description
1	<i>GHG Emissions</i>	Te Atakura First to Zero is WCC’s blueprint for reducing greenhouse gas emissions produced in Wellington City to zero by 2050. As such, WCC's Final Waste Option should align with this ambition.
2	<i>Circular Economy</i>	The Final Waste Option should support a transition to a circular economy that reflects natural systems and puts the wellbeing of Papatūānuku first.
3	<i>Community Connection</i>	The final waste disposal option enables and supports community connection and understanding of residual waste management, and is not a barrier to waste minimisation initiatives
4	<i>Scalability</i>	The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received.
5	<i>Technical Maturity</i>	Implementing a Final Waste Option that is already established will reduce the technical risks involved. Where a technology has had 10 or more successful uses it is likely to be well understood with suitable parts, operators and expertise. Any option that has been implemented in less than ten sites globally or is still in the research phase indicates that this process is novel and so presents a higher risk for Wellington City Council.
6	<i>Time Frame</i>	The consent for the Southern Landfill expires in June 2026 and as such the Final Waste Option will need to be constructed and operational before this date.
7	<i>Local Community Effects</i>	The Final Waste Option should minimise effects on the local community, including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area.
8	<i>Environmental Effects (water)</i>	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse effects to waterways and surrounding aquatic environments i.e. emissions to watercourses.
9	<i>Environmental Effects (land)</i>	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions and contamination to surrounding land.
10	<i>Environmental Effects (air)</i>	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions to air (including from transport) e.g. particulate or VOC emissions.

11	<i>Consent and Planning</i>	The Final Waste Option should have a strong likelihood of approval given existing policies, and alignment with central policy direction.
12	<i>Value for money</i>	The Final Waste Option should provide overall value for money for Wellington City ratepayers and ensures any financial investments takes into account intergenerational costs considerations
13	<i>Robustness/ Reliability</i>	The Final Waste Option should be robust and reliable enough to handle changes in incoming waste content, and any equipment should be available and online for as close to 100% of its required operational hours as possible.
14	<i>Size</i>	The Final Waste Option should be able to fit within the existing site, or be able to integrate into existing waste network.
15	<i>Resilience</i>	The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations (e.g. earthquakes or other natural disasters). This will consider day-to-day waste transport corridors including whether the solution is based locally or outside the Wellington region
16	<i>Te Ao Māori</i>	The Final Waste Option should uphold Te Ao Māori and uphold the commitments of Te Tiriti o Waitangi, to ensure the protection of tapu, the wellbeing and restoration of Papatūānuku, and provide options which are suitable for the physical and cultural environment of Aotearoa. As part of this, a strong partnership with Mana Whenua must be embedded within the foundation of the option.

As discussed earlier, the three original Absolute Criteria (Technical Maturity, Time Frame, Scalability) have been added to the list of scoring criteria, and an additional criterion was added to cover any aspects of Te Ao Māori not adequately covered in the previous 15 criteria.

3.3.3 Updated Options List

To reflect the modified focus of the assessment (i.e. final residual waste management options only), a large number of options previously included were no longer fit for inclusion in the updated MCA process. This includes options that represented residual waste reduction/diversion technologies i.e. Mechanical Recycling Facility (MRF), or technologies that could only handle a small portion of Wellington City's waste and would need to be combined with landfilling or waste export to treat all of Wellington's wastes i.e. vermicomposting or Anaerobic Digestion.

Please see the following section for detailed descriptions of the options assessed as part of the MCA.

4 Detailed Descriptions of Long List Options

4.1 Landfill (Stage IV & Piggyback Expansion)

4.1.1 Summary of Technology

Landfill is the most common method for disposal of waste internationally. Residual waste, after any waste diversion activities, is buried in a suitable parcel of land, sealed with earth cover and left to degrade over time.

Landfills generally house transfer stations to assist with safe disposal of domestic waste from a variety of sources as well as coordinate other waste diversion activities nearby. This option can handle a variety of filling rates to mirror the waste volumes received, and can be combined with other waste handling technologies to receive waste that cannot be recycled or reused.

It is generally considered a 'low-tech' approach which means expertise to build and operate landfills are more readily available and operations are less reliant on highly skilled operators.

Upon closure of a landfill, there is a general requirement to allocate resources to monitor and maintain these parcels of land over a period of 30 -50 years. Based on monitoring, intervention may be required to ensure contaminants that may be entering the environment are controlled.

Once closed, old landfill sites will have limited usage for residential, commercial, and agricultural activities and are generally turned into recreational fields or open spaces.

4.1.2 Technology Maturity

Landfills are the most commonly used method of waste disposal both in New Zealand and internationally. Given its wide usage, innovation in engineering materials to support landfills, such as engineered liners to prevent ground water contamination and gas capture pipes to mitigate landfill gas releases, are easily accessible, well-understood and proven in New Zealand.

4.1.3 Summary of waste processed and residual streams

Landfills, with appropriate controls and liners, can receive a wide range of waste; from contaminated material, MSW and asbestos contaminated material. Contaminated soils can be disposed of in dry cells, separate from mixed waste in general landfill cells.

4.1.4 Emissions

When sealed, modern landfills produce minimal emissions to air and/or odours due to gas capture systems. Landfills require properly designed liners and leachate management systems to prevent emissions to surrounding land and/or waterways and this is achievable with sufficient design and engineering. The risk of liner leakage and emissions to water or land is a risk for the operating and non-operating lifetime of the landfill, so requires continual monitoring to minimise and eliminate these risks.

4.1.5 Alignment with Circular Economy

Fundamentally, as a solution landfilling does not align with the circular economy when used to manage organic and recyclable waste streams. However, landfilling is necessary when handling harmful or toxic wastes that cannot currently be reused or recycled, and therefore is the default option when this waste must be disposed of safely.

4.1.6 Alignment with Te Atakura First to Zero

Organic material buried in the landfill will degrade over time under anaerobic conditions, producing methane and carbon dioxide. Methane is approximately 25 times for potent than carbon dioxide as a GHG.

Modern landfills have methane capture systems installed where methane is captured and used as fuel for electric generation or upgraded to be used as a natural gas substitute. On average, New Zealand landfills with landfill gas capture systems capture approximately 60% of the theoretical methane they produce. Manufacturers of gas capture technology have claimed that new systems can produce higher capture rates but this has yet to be seen in a New Zealand context. Please refer to Appendix D for more information.

4.1.7 Landfilling Options at the Southern Landfill.

Considering the land is designated for landfill under the current district plan the Council have proposed 2 options for landfilling.

Each will be described below with a CAPEX and OPEX review for each option.

a. Option 1: The 'Up Valley' filling option known as Southern Landfill Stage IV.

This option was consulted on in 2019 – where the landfill would continue north of the current stage of landfill into undeveloped land. The new landfill would require extensive earthworks as well as the extension of the current stream diversion tunnel further up the valley that runs under the existing landfill stages.

This concept allowed for the eventual daylighting of the stream via a man-made stream running the perimeter of the landfill. This man made stream would eventually join up with Careys stream upon closure. This eliminates the reliance of the stream diversion tunnel that runs under the existing stages of the landfill to continuously divert water - thus, removing any future risk of a tunnel failure that could result in creating an artificial lake buttressed against a landfill. This would have severe environmental consequences to the lower reaches of the stream.

The landfill would have a high cost with approximately 25-30 year asset life based on current waste volumes. The following capital estimate is taken from WCC's previous landfill optioneering works:

Table 7: Southern Landfill Stage IV Capital Cost Summary

Southern Landfill Stage IV – Capital Cost Summary	\$ (NZD)
Preliminary & General Costs	\$25.2M
Earthworks and Site Preparation	\$41.4M
Groundwater and Stormwater	\$6.3M
Lining and Leachate Systems	\$21.1M
Other Costs (incl. storage ponds, gas capture, landscaping etc.)	\$17M
Total	\$111M

Based on current landfill operations, operational costs (based on long-term annual contracts to operate the landfill) come to **\$3.68M** annually.

b. Option 2: The infill of the closed stage 2 option known as the 'Piggyback' option.

This option was considered as part of the 2019 consultation process but was not consulted on. A new landfill would effectively be built over a closed stage of the existing landfill (Stage 2). The area is currently being used as a storage area for the council as well as for the current council green waste composting operations.

This option does not require removal of vegetation from undeveloped land and reclamation of the stream further north of the current stage 3 area. However, it does not remove continued reliance on the current

stream diversion tunnel or mitigate the consequences of a tunnel collapse and the resulting accidental lake forming north of the existing stage 3 landfill.

This landfill option would have a lower capital cost and a smaller asset life of approximately 12 – 15 years based on current waste volume generation. As a result it would also decrease the amount of embodied emissions associated with the landfill expansion option.

The following capital estimate is taken from a T&T report on the Piggyback landfill development option:

Table 8: Southern Landfill Piggyback Extension Capital Cost Summary

Southern Landfill 'Piggy back' Extension – Capital Cost Summary		\$ (NZD)
Preliminary & General Costs		\$6.3M
Earthworks and Site Preparation		\$19.7M
Groundwater and Stormwater		\$1.9M
Lining and Leachate System		\$4.9
Other Costs (incl. weighbridge, compost relocation, landscaping etc.)		\$9.8M
Total		\$42.5M

Based on current landfill operations, operational costs (based on long-term annual contracts to operate the landfill) come to **\$3.68M** annually.

4.1.8 Compatibility with Waste Minimisation/Recovery Initiatives

Landfilling is a scalable Final Waste Disposal Option, and landfills are able to receive a highly variable volume of waste and manage a decreasing amount of non-divertible waste over time. That being said, large landfill developments need to be planned carefully to ensure that the size of the landfill corresponds to the expected volume of waste expected to be received over the landfill's lifetime. If a landfill is sized too small, the operational lifetime of the landfill will decrease. If the landfill is sized too large, there is a risk of higher-than-required capital expenditure to establish the landfill, and higher-than-required embodied carbon emissions associated with the construction and establishment of underground landfill cells.

4.1.9 Community Stakeholder Feedback

a. Stage IV Landfill Extension

Overall feedback received on this option from Community Stakeholders raised some concerns with the implementation of this option as described. On one hand, stakeholders recognised the advantages of implementing a larger landfill development with a 25-30 year lifetime; this allows additional flexibility and scalability which can allow additional time for installation of developing waste technologies. However, there was mixed feedback on whether the additional construction costs and embodied carbon would outweigh these benefits.

There were also concerns raised regarding the development of the landfill nearer the site boundaries leading to increased wind-blown pollution, resulting in increased odours, pests, and associated environmental/ecological impacts. Several stakeholders recommended a further assessment of impacts should be undertaken if this option is to proceed.

b. Piggyback Landfill Extension

Overall feedback received on this option was supportive, with a number of stakeholders raising this as their preferred option. As with the Stage IV landfill, stakeholders raised the conflict between scalability/flexibility and locking in landfilling as a long-term option in Wellington City; the Piggyback expansion option represents a short-to-medium term final waste option to support accelerated development of alternative waste management systems in Wellington City which some stakeholders raised as a risk.

In addition, there were some concerns raised around the continued risk of stream contamination since this option would result in continued reliance on the underground tunnel to prevent contamination of the stream.

4.2 Energy from Waste

4.2.1 Summary of Technology

In this report we use the term “Energy from Waste” (EfW) with reference to the combustion of waste, as opposed to pyrolysis, gasification, or biological processes such as anaerobic digestion.

There are three types of waste combustion technology in wide-scale operation:

- grate fired systems;
- rotary kilns; and
- fluidised bed combustors.

Figure 4 shows a diagram of a grate fired system which is the most developed for the combustion of municipal solid waste (MSW) and commercial and industrial (C&I) waste. However, the overall process is very similar for all three combustion technologies.

The waste is deposited into a bunker where it is mixed by a crane. The crane then drops the waste onto a feeding chute which feeds the grate located in the lower part of the furnace, where the waste is combusted. The furnace is designed to ensure that the flue gas are raised to a minimum of 850 °C, with a minimum of 2 seconds flue gas residence time at this temperature to ensure the destruction of dioxins, furans, polycyclic aromatic hydrocarbons (PAHs) and other organics. The hot flue gas is then passed through the boiler, raising the steam which drives the turbine to produce electricity.

The flue gas is then passed through a flue gas treatment (FGT) system which removes pollutants from the gas before it is released to the atmosphere. Ash streams are collected from the furnace, boiler and the FGT and stored before being removed from site.

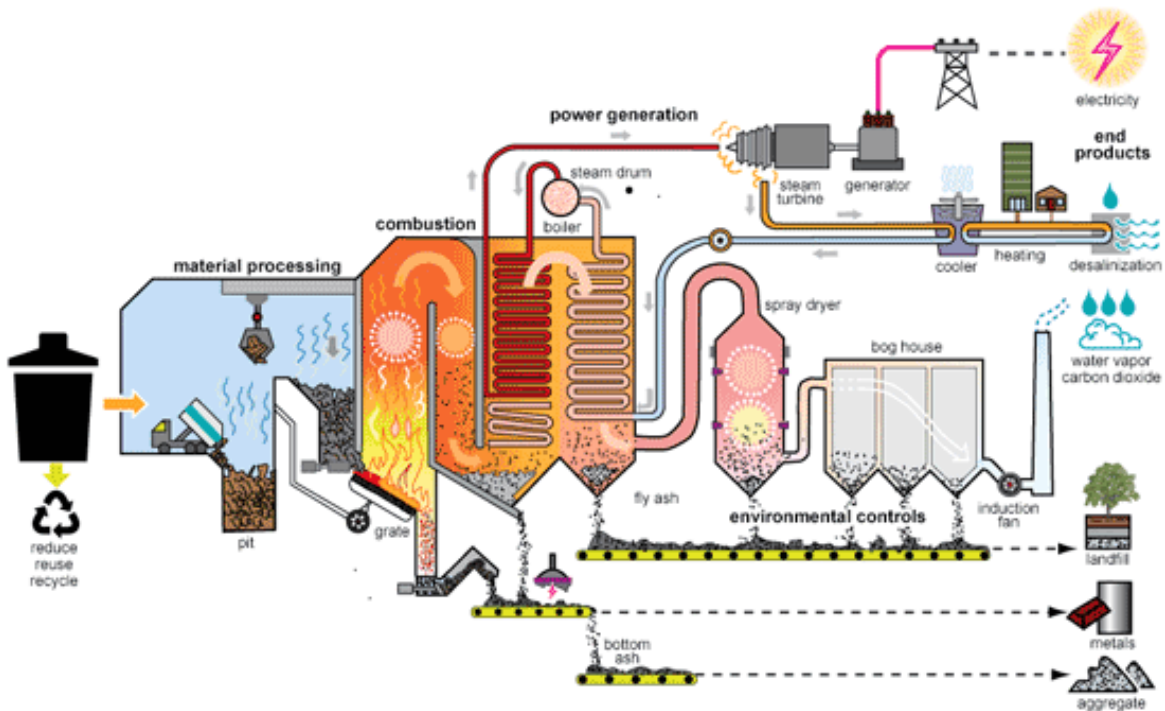


Figure 4: Energy from Waste Process Illustration (Source: Deltaway Energy, 2020)

4.2.2 Technology Maturity

Waste combustion systems, and in particular grate fired systems, have been used worldwide for decades and there are several hundred such plants operating worldwide.

4.2.3 Summary of waste processed and residual streams

The combustion units are designed to handle a wide range of calorific values which is important with the inhomogeneous nature of the waste. Grate based systems and rotary kilns are capable of processing municipal solid waste (MSW), commercial and industrial (C&I) waste, and fuel derived from MSW and C&I waste (called refuse derived fuel) with very little or no pre-treatment required. Grate based systems are also capable of co-firing sludge and clinical waste, although the unit would have to be designed specifically to handle such material. Fluidised bed combustors are more sensitive to particle size and metal content so would require the material to be mechanically pre-treated to remove such material before they enter the furnace.

Ash is extracted from the furnace, boiler and from the FGT. Ash from the furnace and the boiler, called “bottom ash” is generally non-hazardous and can be used in building materials such as aggregate and filling materials. Ash from the FGT system, called “air pollution control residue” (APCR), is hazardous and is generally sent to landfill.

There are also wastewater streams from various processes, such as boiler blowdown and drains. These are collected and treated on site by an effluent treatment plant before being discharged to sewer.

4.2.4 Flow Diagram and Mass Balance

Below is a flow diagram for the waste streams needing treatment, and what portion of this waste can be treated by the Energy from Waste plant.

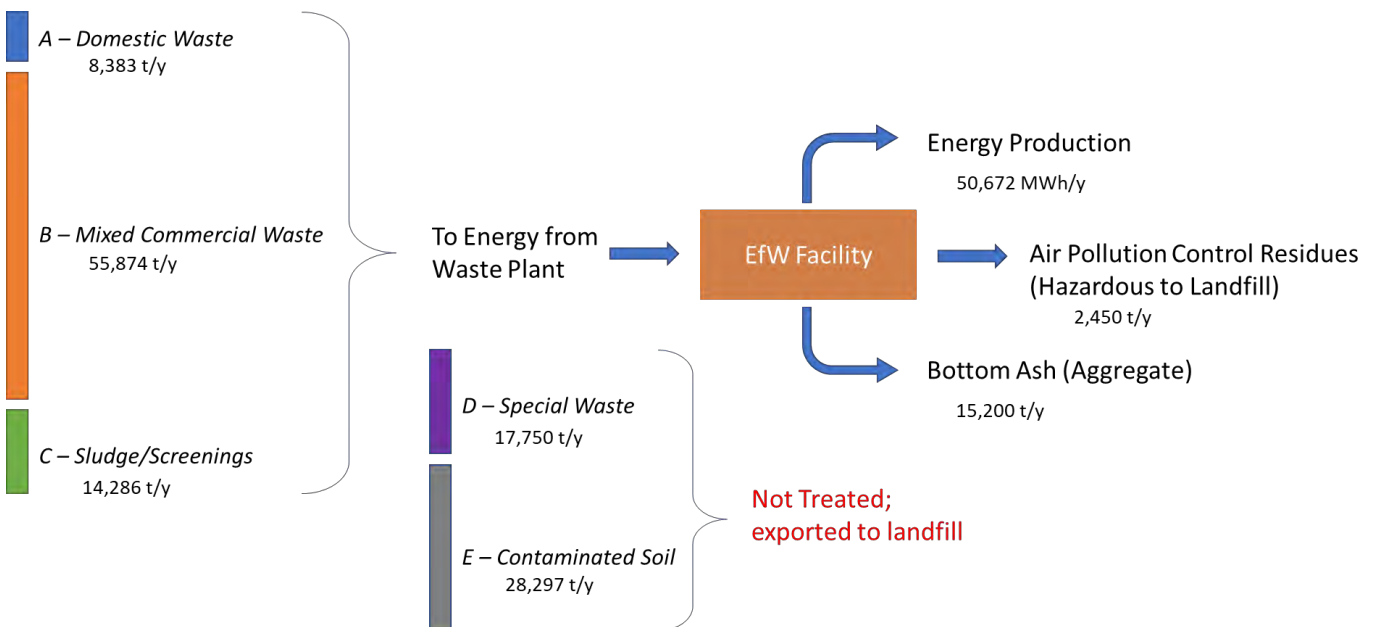


Figure 5: EfW Material Flow Balance

The Energy from Waste plant is able to treat the combustible wastes from streams A, B and C, but cannot treat streams D and E. The Energy from waste plant reduces the volume of treated waste significantly, but there will still be residues from the plant that will need to be disposed of to landfill.

4.2.5 Emissions

In the European Union the directive applicable to the regulation, process controls, emissions and management of the environmental impact of EfW plants is the Industrial Emissions Directive (IED). Chapter IV of the IED applies to activities that involve the incineration and co-incineration of waste. Furthermore, the European Union has also published a revised Best Available Techniques Reference Document for Waste Incineration (BREF), which will determine a further reduction in emission limits for new plants in the near future. The table in Appendix D shows the pollutant limits in the flue gas under the current IED and the BREF document. There is a daily average limit and a half-hourly average limit for these substances which requires continuous monitoring of the flue gas.

In addition to the pollutants that are to be measured continuously, periodic monitoring is required for heavy metals, dioxins, and furans. The second table in Appendix D sets out the limits for the heavy metals in the flue gas.

There is also a limit on the dioxins and furans in the gas that is emitted to the atmosphere of 0.1 mg/Nm³.

Whilst emission limits are low, there are many plants operating within these limits. This will require standard equipment such as lime and activated carbon injection, ammonia injection, and a bag filter.

4.2.6 Alignment with Circular Economy

The Energy from Waste process is not a fully circular waste management technology. Compared with other technologies like improved material recycling or regeneration systems, Waste to Energy does not allow processed materials to be converted back into their pre-disposal form. However, it does allow the production of energy in the form of heat or power, and the ash product generated by a Waste to Energy plant can be used in industries like construction. In this way, Waste to Energy is still much more circular than traditional linear waste management strategies; it minimises the amount of waste that will end its life in landfills and enables the generation of valuable by-products from wastes.

4.2.7 Alignment with Te Atakura First to Zero

Combustion of biogenic wastes greatly reduces the global warming potential of these wastes, especially compared to disposing of these materials in landfills. This is primarily achieved by preventing the organic materials from decomposing into biogenic methane in landfills, which is a much more potent greenhouse gas than carbon dioxide.

In the case on non-biogenic wastes i.e. plastics, combustion of these materials in Energy from waste plants greatly increases the global warming potential of these wastes. Normally, these wastes do not decompose naturally in landfills and have little greenhouse gas emissions associated with them, but when combusted they produce large quantities of non-biogenic CO₂.

Based on Wellington Waste's indicative waste profile, even with the increased emissions from the combustion of plastic wastes the overall reduction in carbon emissions from preventing organic wastes generating biogenic methane is still a net benefit, but only a slight one and does therefore present a challenge long term when considering a goal of zero carbon emissions. Please refer to Appendix D for more information.

4.2.8 Capex and Opex

a. Capital Costs

Based on examples of Energy from Waste facilities installed in Europe incl. the UK and the anticipated waste volumes for the Wellington region going forward, an Energy from Waste facility would cost around \$214M NZD to design, consent and construct in a New Zealand context.

Table 9: Energy From Waste Facilities - Capital Cost Summary

Energy from Waste Facilities – Capital Cost Summary	\$ (NZD)
Process/Mechanical works incl. Indirects	\$153.4M
Civil Works incl. Indirects	\$60.4M
Total	\$213.8M

b. Operational Costs

Energy from Waste facilities require staff to operate and maintain equipment (around 22 FTEs for a plant of this size), and there is a cost associated with disposing of the generated fly ash and bottom ash. The facility does generate revenue from the electrical power it generates, which helps offset other operational costs.

The waste streams that the EfW plant cannot treat (contaminated soil and special waste) will need to be disposed of at a separate landfilling facility. A cost for this disposal is included below.

Table 10: Energy from Waste Facilities - Operational Cost Summary

Energy from Waste Facilities – Operational Cost Summary	\$ (NZD)
Power Consumption	\$0M
Power Generation	(\$4.8M)
Annualised Maintenance Costs	\$5.7M
Staffing Costs	\$1.7M
Residue Disposal Costs	\$1.5M
Total	\$5M
Offsite Disposal Costs for Non-treatable Waste	\$9.7M
Total	\$14.7M

To reduce these offsite residual waste disposal costs, EfW plants are often situated near a landfill which can accept the plant residues and non-treatable waste streams. This model could decrease the overall operational costs considerably.

c. Cost Sensitivity

i. Power Prices

A large portion of the operational costs of an EfW plant are offset by the sale of generated electricity. In recent years, spot prices on the wholesale electricity market have varied by large amounts, and there are many predictions for long-term stabilised power prices as the grid becomes more renewable. To this end we have analysed the impacts of power sale prices increasing or decreasing by 25%.

A change in power price of 25% represents a \$1.2M variation in annual operational revenue for this facility, which is equivalent to a 25% change in overall operational costs before accounting for disposal of non-treatable wastes.

ii. Bottom Ash Disposal Costs

In our operational cost estimate, we assumed that bottom ash produced by the plant could be used in aggregate applications like construction or roading and therefore would only cost \$50/t to dispose of allowing for transportation to users etc. If this material would have to be landfilled instead, the operational cost for the facility would increase by \$2.4M. If the bottom ash could be sold at a higher price making the bottom ash cost-neutral to sell to customers, the operational costs would decrease by \$760K.

4.2.9 Compatibility with Waste Minimisation/Recovery Initiatives

The scale of the Energy from Waste plant proposed for handling residual waste currently generated in Wellington City is approaching the limit for feasible EfW plant operation. If the annual tonnage of waste being

collected as feed material for the plant was to decrease significantly as a result of waste minimisation and recovery initiatives, it is likely that the EfW plant would not be able to operate effectively. Additionally, the most readily-divertible stream of waste in Wellington City's residual waste i.e. plastics greatly improve the operability of the EfW plant due to their high energy content. If these streams were to be diverted to improved recycling operations the performance of the EfW plant would worsen as a result.

4.2.10 Community Stakeholder Feedback

The Energy from Waste option received little support from Community Stakeholder groups during our series of workshops and follow-up online engagements. The two key issues that were echoed in a number of individual submissions were a) the high capital costs associated with this development, and b) the reliance on a minimum amount of incoming waste to operate effectively.

In comparison to both landfilling options, Energy from Waste's upfront costs to construct and commission an operating facility are much higher. In addition to this, the requirement for an Energy from Waste plant to receive a certain quantity of waste to operate effectively is perceived as a barrier to upstream waste minimisation. There is a risk that changes in waste management behaviour within Wellington City could mean that the operational and financial performance of the EfW plant becomes worse than currently assumed.

4.3 Waste Export to Landfill

4.3.1 Summary of Technology

Landfill is the most common method for disposal of waste internationally. Residual waste, after any waste diversion activities, is buried in a suitable parcel of land, sealed with earth cover and left to degrade over time.

Outside of Wellington City there are a number of existing, consented landfills that could be used to receive waste generated in the Wellington region. Today, the majority of Wellington City's C&D waste is disposed of outside of the city in landfills not operated by WCC (as an example).

This approach could be scaled up for all other kinds of waste if WCC does not want to invest in local waste treatment and disposal, and waste generated in Wellington City could be exported to other regions for treatment and disposal instead.

4.3.2 Technology Maturity

See Section 4.1.2 of the main report.

4.3.3 Summary of waste processed and residual streams

In this scenario, there are a number of landfills around Wellington City and further afield that could receive the wastes generated and exported.

4.3.4 Emissions

As in Section 4.1.4 of the main report, advanced landfills can mitigate the majority of emissions to land and waterways and odour effects can be minimised. This is highly dependent on the landfill being selected to receive wastes in the export option, and likely emissions from previously constructed regional landfills around the Wellington region would not be as effective at preventing these emissions as a newly-constructed landfill.

4.3.5 Alignment with Circular Economy

See Section 4.1.5 of the main report.

4.3.6 Alignment with Te Atakura First to Zero

Landfilling of waste generates carbon emissions as discussed in Section 4.1.6 of the main report. Depending on the landfill selected to receive this waste and the level of landfill gas capture installed, the associated emissions could be better or worse than if the waste was disposed of at a new landfill development at the Southern landfill facility.

In addition to carbon emissions from waste degrading in landfill, transportation of this waste via vehicle to landfills located outside of Wellington City would lead to additional carbon emissions. The exact location of alternative landfill locations will determine the quantity of additional carbon emissions. Please refer to Appendix D for more information.

4.3.7 Landfilling Capacity around Wellington City

There are two publicly-owned Class A landfills within 30km of Wellington City that could receive all categories of waste currently received at the Southern Landfill. Of these landfills, the first is currently consented until 2030 and is preparing a new consent application to increase its available capacity by 400%, equal to around 60% of the capacity that could be provided by the possible SLF extension. This new consent may require new designation which could affect its ability to accept all categories of waste. The second landfill is consented until 2039, with a capacity under consent similar to the volume that the possible SLF extension could provide.

However, these landfills are likely to prioritise waste disposal from their local municipalities before making capacity available to receive waste from Wellington City, so these interactions need to be explored in detail.

There are also a number of private waste services around the Wellington region including several C&D/Cleanfill Class C landfills which are currently utilised for Wellington City's C&D waste, as well as two green waste processing operations that would not be suitable for mixed wastes.

4.3.8 Operational Costs of Waste Exporting

Based on discussions between WCC and other Wellington region landfill operators, costs for transportation and disposal of municipal waste outside of Wellington City would be approximately \$210/tonne of waste. The cost for disposal of contaminated materials and/or special waste would likely be even higher, around \$300/tonne. Based on these approximations and the annual waste totals in Table 3, the annual cost to export all of WCC's waste would be **\$27.8M**.

4.3.9 Compatibility with Waste Minimisation/Recovery Initiatives

As mentioned in Section 4.1.8, Landfilling is a scalable Final Waste Option, and landfills are able to receive a highly variable volume of waste and manage a decreasing amount of non-divertible waste over time. That being said, large landfill developments need to be planned carefully to ensure that the size of the landfill corresponds to the expected volume of waste expected to be received over the landfill's lifetime.

In the case of Waste Export to Landfill, there may be risks that the final landfill location for Wellington City's waste may have to balance the requirement to receive variable amounts of waste over time with the obligation to handle local sources of waste as well.

4.3.10 Community Stakeholder Feedback

Some community stakeholders support this as a longer term option i.e. after the end of life of the Piggyback Landfill extension, waste exporting could be utilised to manage remaining quantities of residual waste with the implicit assumption that by this point volumes of waste generated in Wellington City will be far below current levels.

In terms of implementation of this option now, no stakeholders advocated for immediate export of Wellington City’s waste to other regional facilities. The reasons raised include:

- Limits WCC’s control on waste management;
- Increased costs to ratepayers;
- Shifts issue of waste management and external impacts onto other sites rather than promotes management of impacts.

5 Long List Scoring

Each option was scored against the 16 criteria identified in Section 3.3.2 with a score between 1 and 10 for its relative performance. An explanation of the meaning of each score is outlined below:

Table 11: Scoring Categories

Score	Meaning
1	Much worse than other options
3	Slightly worse than other options
5	Neutral
7	Slightly better than other options
10	Much better than other options

Based on our assessments of each technology, the ranking of each identified option as well as commentary on scoring and comparisons between options is shown in Appendix E.

The final scores were not intended to assign final rankings to the long list options or determine whether an option would be reasonably practicable to implement; the scores were used only to help quantify the relative advantages and disadvantages of each option with respect to the chose assessment criteria.

Table 12: Long List Scoring Summary

Option	Strengths	Weaknesses	Score (out of 160)
Stage IV Landfill Extension	<ul style="list-style-type: none"> • Robust, scalable, mature technology, resilient 	<ul style="list-style-type: none"> • Construction/Consenting timelines • Local Community Effects 	103
Piggyback Landfill Extension	<ul style="list-style-type: none"> • Same as Stage IV Landfill Extension • Consentability • Value for money 	<ul style="list-style-type: none"> • Does not remove risk of contaminating stream 	119
Energy from Waste	<ul style="list-style-type: none"> • Reduced environmental effects to land • GHG emissions 	<ul style="list-style-type: none"> • Impacts on upstream waste diversion practices • Scalability • Consenting/Planning 	87
Waste Export to Landfill	<ul style="list-style-type: none"> • Consentability • Timeframe 	<ul style="list-style-type: none"> • Resilience • Value for money 	92

Our analysis shows that no option is able to fully meet the requirements of the 16 identified criteria. The highest scoring option, Piggyback Landfill Extension, scored an average of just under 7.5 out of 10 for each criteria. The lowest scoring option, Energy from Waste, scored just under 6 out of 10.

The difference in scores between 1st place and 2nd place, and between 2nd place and 3rd place, are more pronounced than the difference between two lowest scoring options.

6 Sensitivity Analysis

Initially, all objectives were weighted equally with options scored out of 10 for each (giving a maximum of 160 points). This allowed for comparison between initiatives across all objectives. To account for relative importance of objectives as identified by WCC and community stakeholders, five different weighting scenarios were applied to understand the sensitivity of the findings and gain a better understanding of what the preferred options were. These scenarios were:

- Raw score (all objectives equal)
- Weighted for GHG Emissions
- Weighted for Alignment with Te Ao Māori
- Weighted for Scalability
- Weighted for Environmental Emissions
- Weighted for Resilience

To conduct this assessment, an extra 20 points was assigned to the critical criterion in each sensitivity case, raising its total value to 30 points while others were kept at a value of 10 points.

The results of this comparison are given below:

Table 13: Sensitivity Weighting Comparison

Option	Stage IV Landfill	Piggyback Landfill Extension	Energy from Waste (EfW)	Waste Export
Raw Score (%)	64%	74%	54%	58%
Weighted for GHG Emissions (%)	61%	72%	56%	54%
Weighted for alignment with Te Ao Māori (%)	63%	74%	52%	52%
Weighted for Scalability (%)	68%	77%	52%	62%
Weighted for Environmental Emissions (%)	61%	71%	55%	56%
Weighted for Resilience (%)	68%	77%	56%	52%

We can see from these sensitivity analyses that the relative position of each option stays relatively constant throughout the sensitivity analysis process. Of the two local landfill extension options, the Piggyback Expansion consistently ranks ahead of the Stage IV Expansion. Both local landfill expansion options score higher than either Energy from Waste or Waste Export to Landfill throughout all sensitivities.

7 Conclusions and Next Steps

This analysis has revealed that there are several valid and technically sound final waste options for WCC to consider when analysing its future waste management strategy and operations in light of the Southern landfill consent expiry date, and capacity constraints.

None of the four options score perfectly against the identified criteria from the MCA Assessment, and each has its own distinct advantages and disadvantages when compared against the other identified options.

The next step for Wellington City Council will be to assess the options to determine what is practical to implement within the identified timeframe.

After this process is complete, the Council will be responsible for further refinement of the list of final waste options as required, after which the Council will consider the merits of the final short list of options and advance Council decision making in accordance with legislative requirements.

7.1 Selecting A Preferred Option

Based on the results of this assessment process, the option identified as the preferred option for Wellington City's final waste management is the Piggyback Landfill Expansion. In comparison to the other three options, this option performs above other options in a number of categories, and in areas where the option does not fully meet the ranking criteria it still performs similarly to other options. Its total score of 7.4 out of 10 available points (119 out of 160) is a full point ahead of the nearest option (Stage IV landfill extension with 6.4 out of 10), and its position at the top of the list is repeated in each of our sensitivity tests.

One of the main advantages of the Piggyback landfill is that it aligns with WCC's intentions to increase waste diversion and recycling practices, and reduce final waste volumes over the time period that the Piggyback landfill would be operational. The operation of the Piggyback landfill will allow time for waste minimisation project to be implemented, and over time the generated volumes of waste to landfill in the city would decrease. Providing a flexible end location for different kinds of waste over time would enable development and implementation of circular economies for different kinds of materials (organic wastes, plastics, glass etc.) when feasible. The limited lifetime of the landfill expansion will provide an impetus for timely development of these waste reduction and diversion systems.

The option is one of few that would be readily implementable within the required timeframe, and would not pose any large barriers to consenting. In addition, the Piggyback Expansion option provides reasonable value for money and would not burden WCC or ratepayers with large increases in rates due to the relatively low capital cost to construct and low ongoing operational cost.

This option was also supported by Community Stakeholder groups which reflects its well-rounded performance against nominated assessment criteria.

7.2 Preferred Option Commentary

7.2.1 Notes on Selecting a Preferred Option

Based on the material presented in this report, there are multiple advantages and disadvantages for each option when compared against the others.

Below is a brief summary of the key conflicts and uncertainties:

7.2.2 Balancing Competing Objectives

A key finding of the option long list Multi-Criteria Analysis section of this report is that no single option can fulfil each major criteria in the MCA Assessment. An example of this can be seen in the scoring summary for

the “Waste Export to Landfill” option – while this options scores highly on objectives such as Consentability and Timeline, it scores lowly on Value for Money and Resilience. Another example is present in the Piggyback landfill option; while this option delivers well across most categories, it does not provide the same flexibility and scalability as a full landfill extension and does not mitigate the contamination risk to the underground stream beneath the current landfill. Selection of a preferred option has to consider the balance of advantages and disadvantages, with the understanding that a higher overall scoring leads to better overall outcomes for all stakeholders.

7.2.3 Types of Waste Needing Treatment

A major advantage of landfilling over alternate waste treatment technologies is that it is able to receive almost any kind of waste. Energy from Waste for example is unable to receive and process Contaminated Soil and Special Waste streams and therefore Energy from Waste would need to be employed in tandem with landfilling to provide appropriate coverage for the different wastes generated in Wellington City.

A

Appendix A – Minutes of 1st Stakeholder Engagement Workshop

Residual waste disposal options working party - 18/11/2021

Wellington City Council, 113 The Terrace, Wellington

Attendees:

- Angela Wilson - Owhiro Bay Residents Association (online)
- Sue Coutts - Zero Waste Network
- Carl Savage - Greater Brooklyn Residents Association
- Liam Prince- Waste Free Wellington (standing in for Pare Kore - Te Kawa Robb)
- Martin Payne - Friends of Owhiro Stream
- Geordie Gartrell – Zealandia
- David Howie - Waste Management
- Mike Downer – EnviroWaste Wellington
- Siobhan Proctor - WCC
- Graham Spargo, Matt Paterson, Eleanor Grant (online) - Beca

Summary of key discussion points:

Introductions, housekeeping and order of events. Around the table introductions.

Discussion of the pre-prepared terms of reference.

Actions:

- No agreement on terms of reference for the working party. Working party to review scope for the next meeting via email.

Discussion over the purpose of the meeting, the purpose of the working group generally and a desire amongst group members to discuss the overarching issues generally. Comments regarding the economic model of the landfill and residual waste and confused priorities from WCC as landfill operator/owner. Discussion over the regional waste minimization plan, and WCCs waste minimizations work streams that are out of scope of this work stream.

Actions:

- Beca & WCC to clarify the differences between the consulted regional waste minimization strategy and the WCC draft minimization plan, and confirm which one is being used for this residual waste process.

Eleanor detailing the background of the project - explaining the 2013 T&T report and how WCC and Beca are looking at possible residual waste design solutions from a 'blank sheet of paper' to not prejudice any outcome for residual waste.

Eleanor explaining that an MCA is a tool to refine options – we're here to decide the criteria to judge the options. General discussion over the pros and cons of an MCA – it is a methodology that can weigh and assess multiple different criteria, including cultural factors such as a Te Ao Maori impact that normally can't be directly compared.

Eleanor explaining the draft criteria developed for the MCA process.

Discussion over the criteria of scalability. General agreement that it would be an important criteria. Strong desire in the group for Wellington to not to get locked into importing rubbish to keep a waste to energy plant operating and not affect aspirations to reduce waste through upstream initiatives in the future. Some concern over exact wording noted – the criteria could link to the waste minimization strategy more directly.

Actions:

- Beca to amend the scalability criteria to reflect the expectation that waste volumes will decrease over time (with the possible exception of one-off events such as natural disasters) and that the residual waste option must not prejudice upstream waste minimization strategies.

Discussion over the timeframe criteria. General disagreement with it being an absolute criteria, with general agreement that a temporary consent could allow time for future technologies to become viable, or create pressure for people to change their habits. Disagreement from WCC representative at this point, saying that they (WCC) won't operate the landfill without a resource consent, and anything that doesn't renew the consent or be in place by 2026 will leave a gap.

Actions:

- Beca to review if timeframe should be an absolute criteria.
- Beca and WCC to confirm if a temporary resource consent for the landfill is a possible technical solution.

Discussion regarding the general necessity of a landfill no matter which option is picked, as the functions and flexibility of a landfill can't be easily be replaced by other options. General agreement that a landfill of some type would be needed in the future in combination with future waste reduction measures. General agreement that strong behavior change with regard to public attitudes to waste will be needed in the city.

Actions:

- Beca and WCC to confirm if only options that include a landfill should be taken forward to the next stage of the MCA.

Discussion regarding the Te Ata Kura criteria, and general agreement in the group that it should be an absolute criteria as it would likely immediately make several solutions unlikely to be viable (particularly the waste to energy plant option). General agreement in the room.

Actions:

- Beca and WCC to consider if Te Ata Kura alignment should be elevated to an absolute criteria.

Discussion regarding absolute criteria generally, and whether there should be any absolute criteria, or just criteria that are more highly rated than others. General agreement in the room that this should be reconsidered.

Actions:

- Beca to consider whether the MCA structure should include absolute criteria or not.

Discussion regarding the environmental criteria with general agreement that all potential options should achieve good environmental outcomes as a minimum. Some discussion that this criteria didn't really need to be specifically stated - although this position was not universally agreed. Discussion not closed out.

Actions:

- Beca to confirm with working group via survey the preferred weighting for the environmental criteria.

Discussion regarding Te Ao Maori, with multiple group members expressing an unwillingness to speak on behalf of iwi, but a desire to ensure that there is a specific point for their concerns to be addressed instead of "weaving Te Ao Maori through the process". General agreement in the group with this. Additional discussion regarding a lack of social/community dimensions of the criteria generally.

Actions:

- Beca and WCC to investigate adding a specific Te Ao Maori criteria

Discussion regarding the administrative functioning of the working group, and the time/date of the next meeting.

Actions:

- The date of the next meeting confirmed to be 14 December 2021.

End of meeting at 8:40pm.

B

Appendix B – Minutes of 2nd Stakeholder Workshop

Residual waste disposal options working party - 14/12/2021

Wellington City Council, 113 The Terrace, Wellington

Attendees:

- Angela Wilson - Owhiro Bay Residents Association (online)
- Alison Forrest – Owhiro Bay Residents Association
- Carl Savage - Greater Brooklyn Residents Association
- David Howie - Waste Management
- Geordie Gartrell – Zealandia
- Liam Prince- Waste Free Wellington (Online)
- Martin Payne - Friends of Owhiro Stream
- Mike Downer – EnviroWaste Wellington (Online)
- Sue Coutts - Zero Waste Network
- Te Kawa Robb – Pare Kore
- Siobhan Proctor, Robert Hon, Emily Taylor-Hall, Emma Richardson, Elliot Higbee - WCC
- Graham Spargo, Matt Paterson, Eleanor Grant (online) - Beca

Summary of key discussion points:

6.05pm: Overview from Graham of the previous meeting, introductions of new group members, housekeeping details and a run through of the proposed order of events.

6:10pm: Recap from Siobhan summarizing the previous meeting, and reiterating that no matter how successful the waste minimization strategy for Wellington is, there will likely be a need to dispose of residual waste for the next ~20 years. Notes that that is the purpose of this working group – to develop the criteria that the MCA will use to assess options for the residual waste disposal option. The WMMP process will be responsible for waste minimization efforts in Wellington City.

Comments from some group members that they are concerned that they are not considering the wider effects of waste minimization on the residual waste options, and view that waste minimization strategies will be affected by the choice of residual waste option.

Actions:

- N/A.

6:15pm: Discussion led by Emma on the Wellington Regional Waste Management and Minimisation Plan (WMMP), the differences to the City Council's draft waste minimization roadmap and the timelines required to develop the strategy.

General acceptance from group members that a waste disposal facility is required post 2026 but concern that Waste Minimisation initiatives may not eventuate and the Council will continue landfilling as 'business as usual'. Council officers explain that it has intentions to reduce waste through the WMMP process but this is a democratic process and will require councillor and by extension, ratepayers approval.

Council officers assure that high and mid-level waste minimisation and waste data capture initiatives studies are already underway and will ramp up in the following years – kerbside review, waste licensing services, organic diversion trials, resource recovery infrastructure review.

WCC has committed to sludge minimisation infrastructure to reduce sludge waste by 90% targeted to be operational by 2026.

Actions:

- N/A.

6:30pm: Discussion led by Robert explaining the four possible shortlisted options. Two landfill options (piggyback vs stage four), waste to energy, or closing the landfill and exporting residual waste - and the timeframes required to get those consents in place before the 2026 expiry of the existing landfill consent. Discussion on the anticipated landfill capacity remaining, and the additional capacity (airspace and footprint) that the two different landfill options would add. Discussion regarding the length of time that these options would allow the landfill to operate for (potentially 20+ years depending on the success of waste minimization efforts post 2026).

Discussion regarding the waste to energy option, and its (lack of) alignment with circular economy principles in that it would always require a set amount of waste to be viable. Notes that if circular economy is weighted strongly, then this option would struggle to progress. Discussion on the issues that waste to energy is having in Europe and the desire not to repeat those issues here.

Actions:

- N/A.

6:55pm: Discussion by Elliot regarding the statutory responsibilities and timeframes for WCC under the Local Government Act 2002 and Waste Minimization Act 2008. The timelines required for annual plan consultation and the benefits of the MCA process (it's a repeatable and transparent tool).

Discussion regarding landfill care post closure, and the accounting required to achieve this (fund set aside as establishment). Discussion on the finances of landfills – i.e, the Southern Landfill aims to break even, but does get cash injections from special waste occasionally. Overall, not highly profitable for the city once lifetime costs are taken into account.

7:17pm: short break

7:30pm: discussion continues.

Discussion regarding the ultimate aim of a circular economy – ie. that in an ideal state there would be no “leakage”, everything is used and re-used with no residual waste. Commentary that the Te Atakura – First to Zero plan does not reflect this principle well, instead it relies on a linear decrease in waste volumes/ (and associated) emissions. General concern noted that if alignment with Te Atakura is highly weighted in the MCA it could result in perverse outcomes for residual waste.

Discussion regarding iwi partnership, and the lack of Te Ao Maori focus in the discussion to date. Discussion on the challenges that iwi face with resourcing to be able to respond as partners in this process.

8:00pm: Graham gives an overview of the criteria. Begin criteria feedback exercise.

8:40pm: Exercise complete.

Actions:

- Beca to record comments written on criteria and take them into account for criteria weighting.
- Beca and WCC to resend online survey link to allow all groups present to comment on the criteria.

Discussion relating to lack of trust by some group members about engaging in the MCA process. One working member signaled they did not intend to participate in the MCA. General feeling that the process and timeline isn't ideal, and that key principles should underpin this process, not the criteria that the MCA is weighting. The artificial separation between the waste minimization strategy and the specific residual waste disposal options are not appreciated.

Discussion relating to the WMMP and the development timeframes. How would the consent conditions of the residual waste option give effect to the WMMP? Some working group members queried the need for a formal meeting to discuss the MCA results given the scope and showed more interest in engaging with formulation of the next WMMP (required by 2026).

9:00pm: closing commentary from Graham and Siobhan thanking the group members for their input, and describing the next steps in the process from here. Beca to complete the MCA and report back in the new year.

End of meeting at 9:10pm

C

Appendix C – Summary of Stakeholder Feedback

Criteria Feedback &
Option Scores

Respondent	Original Wording	David Howie	Te Kawa Robb	Mike Downer (completed form twice, results collated)	Geordie Gartell	Ali Forrest
Source		Feedback form	Feedback form	Feedback form	Feedback form	Feedback form
GHG Emissions statement wording	Te Atakura First to Zero is WCC's blueprint for reducing greenhouse gas emissions produced in Wellington City to zero by 2050. As such, WCC's Final Waste Option should support this and align with this ambition.	Agree - so long as it is not interpreted as an ability to export emissions or CO2 liability.	No change.	Agree - no change	Yes	Te Atakura First to Zero is a bit out of date (2019) on waste – it doesn't include the Moa Point sewage sludge solution, nor any plans for removing organic matter from the landfills via collection etc.
GHG Emission Score		Critical	Critical	Very Important	Critical	
Circular economy statement wording	The Final Waste Option should support and enable a transition to a circular economy.	To be of value "Circular Economy" needs to be defined as to context within this statement. I am not comfortable with the use of "enable" in this statement as waste sits outside a circular process. My suggestion would be "The Final Waste Option should support waste minimisation and a transition to a circular economy."	Change: 'The Final Waste Option should support and enable a transition to a circular economy that reflects natural systems and puts the wellbeing of Papatūānuku first.'	Agree - No change	Yes	Relevant questions to be considered are: What are the end products? How much goes to landfill after processing (if any)? Are there markets (covered in the criterion 'Maturity of offtake market')? How is the final residual waste to be managed and what legacy does this leave to future generations (5,10,15,20yrs +)?
Circular Economy score		Very important	Critical	Very Important/important	Very Important	
Community Connection statement wording	The Final Waste Option enables and supports community connection and understanding of residual waste management, and supports activities that minimise fly tipping and supports community waste minimisation initiatives.	Agree	Change: 'The Final Waste Option enables and supports community connection and understanding of residual waste management, and supports equitable community waste minimisation initiatives.'	Agree- No Changes	Yes	The social considerations of any final waste option needs to be future-proofed as well as grounded in the here and now. Heavier weighting for the Council as a Corporate Citizen of Wellington, facilitating, showing strong leadership and enabling community connection; this is a fundamental, and understanding it is critical to engagement and success. Current leadership and engagement is poor in whenua kaitiakitanga.
Community Connection score		Very important	Critical	Very Important/important	Very Important	
Scalability statement wording	The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received. The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations.	Agree	Change: 'The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received while upholding the wellbeing of Papatūānuku. The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations.'	Agree- No Changes	Yes	The funding model needs to take into account whether the solution will remain economically viable as waste reduces. The final option must reduce tonnage, have resilience and react nimbly to emergencies and needs to honestly define what an emergency is.
Scalability score		Very important	Very Important	Critical	Critical	

Technical Maturity statement wording	Implementing a Final Waste Option that is already established will reduce the technical risks involved. Where a technology has had 10 or more successful uses it is likely to be well understood with suitable parts, operators and expertise. Any option that has been implemented in less than five sites globally or is still in the research phase indicates that this process is novel and so presents a higher risk for Wellington City Council.	Agree. Need to reference applicable scale material composition to ensure a genuine similar use case for evaluation.	Change: 'Implementing a Final Waste Option that is already established will reduce the technical risks involved. Technical solutions must also ensure it works within te ao Māori, so while technically mature options are preferable, innovation from a Māori world view may open new technologies that best suit the cultural and physical environments here.'	Agree- No Changes	Yes	There are actually 2 aspects to this – international and domestic technological maturity. Even if the technology is mature abroad, NZ has a different environment in many ways and there is no guarantee that - for instance - the legislative framework is suitable or that experts could be shipped in or trained up. Conversely, technology considerations should not exclude innovative options just because they are novel.
Technical Maturity score		Important	Important	Critical	Critical	
Time Frame statement wording	The consent for the Southern Landfill expires in June 2026 and as such the Final Waste Option will need to be constructed and operational before this date (or within 1-2 years if an interim temporary measure is used).	This reads as a pre-judgement. Suggest " The Final Waste Option will need to be consented and operational before this date (or within a confirmed time period after this date if an interim measure is required/used).	Agree	Agree- No Changes	Yes	What is the interim, temporary measure? That sounds a good option. It is not obvious to us that the Waste to Energy can be constructed by 2026, despite the assumption in the Beca report.. There would be many issues to resolve even before building, including getting consents, choosing and acquiring a site, going through a public engagement process, accessing funding, training up local expertise . There has been much sense of urgency around resource consent application time, for a very long time, propelling pre-21st century solutions to waste at the expense of solutions that reflect changing technology and population growth. This is the reason for communities' skepticism that this consent is urgent. There is certainly also urgency around implementing WMMP solutions.
Time Frame Score		Important	Important	Very Important	Very Important	
Local Community Effects statement wording	The Final Waste Option should minimise effects on the local community, including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Agree	Agree- No Changes	Yes	There is also mud, dirt and visual impairment of scenic areas. Impact on public health must also be considered. Any WMMP discussions must include the two private landfills - which actually deal with larger amounts of waste than the Southern Landfill. All landfills (private and public) final waste solutions need to be coordinated because solving the immediate problem of the southern landfill capacity does not address the overall problem of waste minimisation.
Local Community Effect score		Very important	Very important	Very important/important	Critical	
Environmental Effects (Water) statement wording	The Final Waste Option should minimise effects to waterways and surrounding aquatic environments i.e. emissions to watercourses	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Change: 'The Final Waste Option must uphold tikanga and te ao Māori and eliminate any effects to waterways and surrounding aquatic environments i.e. emissions to watercourses.'	Agree- No Changes	Yes	The aquatic flora and fauna will be affected. The groundwater might also be affected. On closure of the landfill there may be residual effects. The final waste option needs to start to show a roadmap of replenishing, reinvigorating, and depolluting both the open and closed waterways (above and below the ground). For too long solutions have sought to remove streams feeding into the Marine Reserve and Strait. This is working against the forces of nature – our suburbs are hilly, and with that comes a network of streams pouring fresh water into the Marine Reserve. Practice over the last century has turned our fresh waterways into 'diverted tunnels', 'drains'. We want to see sewage removed and streams daylighted, but the Stage 4 solution does not daylight the stream until it is closed off, the operative word being 'eventually'.
Environment Effects (water) score		Very important	Critical	Critical	Critical	
Environmental Effects (land) statement wording	The Final Waste Option should minimise emissions or contamination to surrounding land	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Change: 'The Final Waste Option must uphold tikanga and te ao Māori and eliminate emissions or contamination to surrounding land.'	Agree- No Changes	Yes	Also the flora and fauna. How the land can be restored should be considered, and the residual effects of waste on closure. The final waste option needs to start to show a roadmap of replenishing, reinvigorating and reintroducing natural and fragile flora and fauna.
Environmental Effects (land) score		Very important	Critical	Critical	Critical	

Environmental Effects (air) statement wording	The Final Waste Option should minimise emissions to air (including from transport) e.g. particulate or VOC emissions.	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Change: 'The Final Waste Option must uphold tikanga and te ao Māori and eliminate emissions to air (including from transport) e.g. particulate or VOC emissions.'	Agree- No Changes	Yes	Any solution at the Southern Landfill which affects air quality is of serious public health concern as it is situated in a built-up area. The Waste to Energy option will emit such toxins as dioxins, apparently at very low levels, but still at levels higher than we currently get. Any new solution including landfill, organic and composting at the Southern Landfill must not emit the sort of odours which periodically escape currently, in contravention of the regulations. The aim of the Final Waste Option must be to achieve as close to zero air emissions as current technological solutions enable.
Environmental Effects (air) score		Very Important	Critical	Critical	Critical	
Consent and Planning statement wording	The Final Waste Option should have a strong likelihood of approval given existing policies. This can be demonstrated by a track record for similar consents in NZ.	Given the criteria that consenting and implementation needs to meet the fixed time period, is "consentability" no a given?	Change: 'The Final Waste Option should have a strong likelihood of approval given existing policies, while also being bold, brave and innovative and seeking to go beyond the constraints of existing policies which come with existing limitations.'	Agree- No Changes	Yes	It should also conform to the government's policy direction. This criterion more or less rules out Waste to Energy which has no track record in NZ and will have significant difficulty getting approval.
Consent and Planning score		Very Important	Critical	Very Important/important	Very Important	
Value for Money statement wording	The Final Waste Option should minimise total cost over project life including capex, opex, and revenues (e.g. electricity, heat, recycled products, etc.), and provide value for money for Wellington City ratepayers.	This allows for a very subjective assessment process. Either needs expanding to provide detail of assessment measures to be used, or needs to be simplified to "The Final Waste Option should provide value for money for Wellington City ratepayers."	Change: 'The Final Waste Option should ensure investment is considered from an intergenerational perspective, and that invests adequately in the restoration of the wellbeing of Papatūānuku and where possible, trying to provide value for money for ratepayers.'	Agree- No Changes	Yes	What the funding options are should be considered. It has been stated that Waste to Energy will require a rates hike. The model needs to look at the funding model for the life of the option rather than the project.
Value for Money score		Important	Slightly Important	Important/very important	Very Important	
Robustness/Reliability statement wording	The Final Waste Option should be robust and reliable enough to handle changes in incoming waste content, and any equipment should be available and online for as close to 100% of its required operational hours as possible.	Agree in general however this is two statements and the second half is more of a truism than a criteria. Suggest "The Final Waste Option should be reliable, and robust enough to handle changes in incoming waste content,"	Agree	Agree- No Changes	Yes	Should be future-proof – what is the risk of future obsolescence?
Robustness/Reliability score		Critical	Very Important	Very Important/critical	Critical	
Maturity of offtake market statement wording	If the Final Waste Option will produce secondary products or material streams, it will need to be considered whether mature or developing markets for this material exist, either domestically or internationally.	Agree	Change: 'If the Final Waste Option produces secondary products or material streams, it will need to be considered whether mature or developing markets for this material exist, either domestically or internationally, and take community based resource recovery solutions into account as a possible market.'	Agree- No Changes	Yes	And there needs to be an economic plan. This is consistent with OBRA's vision of an Innovation Precinct that incubates Recycling business science and retail partnering with education providers The Waste option should allow room at the Southern Landfill for a recycling innovation centre which we expect to be part of WMMP deliberations.
Maturity score		Critical	Very Important	Important/critical	Very Important	
Size statement wording	The Final Waste Option should be able to fit within the existing site.	No. This creates a limiting constraint for no clear benefit.	Change: 'The Final Waste Option should be able to fit within the existing site, while taking a wider network approach to satellite and decentralised solutions/hubs throughout the city into account, and is designed to integrate into those.'	It would be preferred if the Final Waste Option could fit within the existing site.	Yes	The assumption seems to be that the site will be the Southern Landfill. For Waste to Energy this is not the only or best option and other sites would have to be considered. For the Piggyback option, not enough information has been released to tell us if this will fit, because there is vagueness around the relocation of the composting plant.
Size score		Slightly important	Very important	Important	Very Important	
Resilience statement wording	The Final Waste Option needs to be resilient and be available when required. This will consider day-to-day waste transport corridors including whether the solution is based locally or outside the Wellington region	Agree		Agree- No Changes	Yes	In an emergency will it allow Wellington to be self-sufficient? The seismic risk to the infrastructure should be assessed. The Final Waste Option also needs to take into account the densely urbanized corridors and the size/ nature of transport that use the corridors. Much of this could be mitigated with resource consent compliance supporting waste reduction at point of creation (building/ demolition). The Final Waste Option must look at the wider picture, rather than just the Southern Landfill, and be coordinated across all three landfills, and any that may emerge in the future.
Resilience score		Important	Critical	Critical	Critical	

Criteria relating to Te Ao Māori overarching view/ Cultural Suitability	Criteria relating to Te Ao Māori overarching view TBC with Iwi	This is a core criteria that needs to be set in conjunction with local iwi. Alignment with Te Ao Maori and Treaty principles is critical.	The overarching criteria must inform all subsequent systems and proposals, to uphold the commitments in Te Tiriti, and ensure long term resilience and wellbeing of taiao and whakapapa for mana whenua.			The Final Waste Option must strongly reflect the changed palette of the community towards Te Tiriti o te Waitangi, Te Ao Māori and solutions which are culturally and socially sustainable, not just business focused.
Criteria relating to Te Ao Māori overarching view score		Critical	Critical	Important/slightly important	Critical	
Additional criteria			Q18 should have been at the top.			
Additional criteria score			Critical			
Landfill Extension - Stage 4	This option was consulted on in 2019 – where the landfill would continue north of the current stage of landfill into undeveloped land. The new landfill would require extensive earthworks as well as the extension of the current stream diversion tunnel further up the valley that runs under the existing landfill. This concept allowed for the eventual daylighting of the stream via a man-made stream running the perimeter of the landfill. This man made stream would eventually join up with Careys stream upon closure. This eliminates the reliance of the stream diversion tunnel that runs under the existing stages of the landfill to continuously divert water - thus, removing any future risk of a tunnel failure that could result in creating an artificial lake buttressed against a landfill. This would have severe environmental consequences to the lower reaches of the stream. The landfill would have a high cost with approximately 25-30 year asset life based on current waste volumes.	Further assessment of impacts required based on reducing annual volume over time	Do not support	This makes sense to me, to provide some resilience and time for future options with developing technologies. Technologies and methodologies are evolving relatively quickly. Sinking vast amounts of money into a long-term Landfill may not be the best use of money.	Zealandia has huge concerns about this extension closer to our perimeter. There is a high likelihood of an increase in wind blown pollution entering the sanctuary. There is a high risk of an increase in mammalian predator numbers because of an increase in food for them. With higher numbers comes an increased risk of a breach into the sanctuary. Wind blown waste and odour also becomes more likely.	The perspective described in the Landfill Extension -Stage 4 was rejected by the OB community in 2019 for these reasons: - it destroys a large area of ecologically valuable land and will remain for a long time, disincentivising waste reduction. - a further length of the stream will be disrupted; although a positive is stated to be the eventual daylighting of the stream, 'eventual' is the operative word - this would only happen after the area is full, i.e.. indefinite . - pests attracted to the waste would be much nearer Zealandia and the far end of Brooklyn. Birds spreading down the corridor towards the south coast would be impacted. These objections still stand. The argument brought up at the working group meeting that it would be easier for council to go for this longer lasting consent rather than fill up the stage 2 first and then have to apply in 15 years or so for stage 4 does not persuade us. We expect there to be minimal waste by that time and that it will be possible, if necessary, to close the landfill.
Landfill Piggyback option	This option was considered as part of the 2019 consultation process but was not consulted on. A new landfill would effectively be built over a closed stage of the existing landfill (Stage 2). The area is currently being used as a storage area for the council as well as for the current council green waste composting operations. This option does not require removal of vegetation from undeveloped land and reclamation of the stream further north of the current stage 3 area. However, it does not remove continued reliance on the current stream diversion tunnel or mitigate the consequences of a tunnel collapse and the resulting accidental lake forming north of the existing stage 3 landfill. This landfill option would have a lower capital cost and a smaller asset life of approximately 12 – 15 years based on current waste volume generation.	Further assessment of impacts required based on reducing annual volume over time	Strongly support	This would be a preferred option in my eyes as opposed to a long-term landfill extension. Doesn't provide the resilience of the Landfill Extension option nor the elimination of the stream/tunnel risk.	Where would the composting operation move to?	For all 3 landfilling options we would like to make the point that: Landfills must not have a prominent role in a modern society. A circular economy means dumping in the Southern Landfill should be drastically reduced to a minimum. Any landfill extension must take this requirement, as evinced in the WMMP, the regional WMMP and the government waste strategy – into account. The funding model needs to be changed to disincentivise burying waste. Where would the composting facility be situated? The stream should not be treated as a nuisance; we should be preserving a rare tohonga and asset to the Wellington community. It reflects an attitude that is increasingly becoming outdated - that business should trump nature. We would prefer an interim extension while the WMMP process decides on volumes and types of waste requiring landfilling. We think 5 years would allow WMMP upstream solutions to reduce amount of land required, thus mitigating concerns around a life 12-15 years. If an extension RC application for this goes ahead we would want to be involved in the application. We would require binding undertakings attached to any RC application, to be discussed in the process subsequent to this decision. We would want this linked to the Greater WMMP Full Transparency – see the data, the plans for the footprint, relocation of the composting, etc.

<p>Energy from waste</p>	<p>There are three types of waste combustion technology in wide-scale operation: grate fired systems; rotary kilns; and fluidised bed combustors. The waste is deposited into a bunker where it is mixed by a crane. The crane then drops the waste onto a feeding chute which feeds the grate located in the lower part of the furnace, where the waste is combusted. The hot flue gas is then passed through the boiler, raising the steam which drives the turbine to produce electricity. The flue gas is then passed through a flue gas treatment (FGT) system which removes pollutants from the gas before it is released to the atmosphere. Ash streams are collected from the furnace, boiler and the FGT and stored before being removed from site.</p>	<p>Energy from Waste is a poor solution for mixed solid waste disposal and has been recently rejected by The EU as a sustainable waste solution. This could be considered at an up stream level for specific waste stream materials but is not a residual waste solution.</p>	<p>Strongly do not support</p>	<p>Like it, allows for future volumes on a narrow footprint of land. Clean solution - and scalable.</p>	<p>What percentage of waste is actually burned in these systems/</p>	<p>We are surprised that this is still on the table. It was shortlisted in the Beca report based on questionable criteria, weightings and interpretation of those. Not least is the fact that the Beca report was written on the assumption that sewage sludge was coming from Moa point. This completely alters the basis of the analysis - as all have agreed. When it became apparent that the sludge was stopping after 2026 the MCA analysis was not re-done on the 14 but a section 10 on sensitivity was added to show how the volumes would change. Waste to Energy has been included in the new list of 4 options now on the table because, as stated at the Waste working group, 14 Dec, it will give a more circular solution than other, now rejected, technology options; it outputs electricity, and an ash that might be usable e.g. in roading, but a final volume of waste is still output, reduced by 75%. However, Eleanor Grant (Infrastructure Committee Oct 14th at roughly 3:29:00) has stated that there are challenges with trying to fit it into a circular economy. This is in effect a waste-run power station, less efficient than a normal one, but outputting electricity and ash. NZ already has a good supply of renewable electricity, and there would have to be a market found for the ash. Council officers have previously stated to us at the CLG that the Waste to Energy plant to be viable would need continued sewage sludge. Eleanor - at the above Infrastructure Committee - confirmed that it would not be economically viable unless it took in 100k to 150k tonnes of waste per annum. The Southern Landfill currently has around 100k tonnes pa and would be getting substantially less on day 1 when the sewage sludge ceases, and then progressively when the organics etc. are reduced. It would need substantial amounts of commercial waste from the private landfills T&T and C&D. The assumption seems to be that it would be sited at the Southern Landfill; however, the above para indicates the need for a regional solution. That would require a whole new perspective. Other reasons for it to be regional are: - Siting it - physically it has a large footprint. - It is the most Expensive option, even before we consider that we would still need to have a landfill extension - although probably less - so it isn't an alternative; you have to fund it as an extra as well as one of the 3 other options. Officers have stated that this will require a rates hike. - Public opinion would be difficult to sway. This plant would not be acceptable to the community of OB and Happy Valley. Consent would be very difficult. Other considerations are: 1. It is not scalable - as waste decreases it would become less and less economic. 2. Environmental - There would be emissions of e.g. dioxins; although apparently very low they would be more than we currently have, and accidents happen. 3. Ash Residue would need a market or else probably stabilising before landfilling. There is also the toxic hazardous ash from the emissions treatment. 4. EU and Nordic countries are moving away from these plants towards upstream solutions. 5. If it did come out from this exercise as the preferred option then it is far from being a done-and-dusted solution - there are a huge number of problems such as where to site it, funding, scalability, consents, data gathering. Which makes it unlikely that it could be delivered for the 2026 deadline. 6. It would definitely have to fit into general WMMP discussions later in the year.</p>
<p>Landfill closure</p>	<p>This option involves closing the landfill and exporting all of WCC waste to a landfill within the Wellington region.</p>	<p>Could include options outside the Wellington area</p>	<p>Support as longer term goal - 20 years, following piggyback option and rapid reduction of landfill waste</p>	<p>WCC loses control over the waste. It would raise costs on disposal and transportation/collection due to distance. Would not be my preferred option as it limits control the city has on its waste. Places the city at the mercy of other controlling parties.</p>	<p>Not really a viable option.</p>	<p>We do not see this as a satisfactory solution as it just shifts the problem elsewhere. We would like to see the Landfill as rapidly as possible phased out as part of the WMMP. After 15 - 20 years we envisage the minimisation of waste and the closing of the Southern landfill.</p>
<p>Additional Comments</p>			<p>Be brave, be bold, be innovative! We only have one planet, we (tangata whenua) have thousand year tested solutions so ensure you engage with us to navigate and co-steer, and think about the legacy you will leave behind for you grandchildren with the options and solutions landed on.</p>			<p>We fully agree with the Beca Report's penultimate sentence: "It may be that WCC is better to invest in upstream activities to reduce waste to landfill."</p>

Waste Free Welly / Para Kore	Carl Savage	Written feedback received as part of 2nd workshop	Summary of Feedback	Amendments to Criteria	Rationale for Amendments	Revised Criteria Wording
Feedback form	Feedback form	Written feedback				
Emissions reduction is an important criteria and it makes sense to align with Te Atakura First to Zero. However, the vague wording risks giving a reductive answer. For example, the benefits of producing 'renewable energy' from burning organics in a Waste-to-Energy facility would look like a positive outcome for GHG emissions if it only considers emissions from the facility itself. This criterion should specify some of the broader emissions impacts, including considering waste-related GHG emissions other than biogenic methane from organic waste decomposing in landfill (i.e. including a consumption-based emissions accounting approach), and the GHG emissions at various stages and processes of the waste management system. As standalone options, none will result in a decrease in waste emissions across material/product lifecycles as they are predicated on continued waste generation. Waste tonnages processed should be consistent across all options - and different waste minimisation scenarios carried out for sensitivity analysis. A consumption-based emissions accounting framework could be added to this sensitivity analysis to see which option best responds to upstream waste and emissions reductions. The criteria also needs to be more specific in terms of boundaries: must be GHG emissions irrespective of where they are generated to avoid options outside of the boundary of WCC (e.g. exporting waste to another landfill) being seen as preferential. The GHG emissions associated with the construction of the infrastructure and the materials used should also be part of the assessment. Finally, the criteria needs to consider how the options will support adaptation to climate change impacts. Some of these points may already be part of Te Atakura, but we recommend adding some of these details to the criteria to reflect the range of emissions and climate change implications of the residual waste options.	AMMENDMENT - reducing gas emissions produced in Wellington City to AS CLOSE TO ZERO AS POSSIBLE by 2050 As such, WCC's Final Waste Option should support this and align with this ambition.	* Te Atakura is good but only a first step, has limitations, Te Atakura only focuses on prod based emissions so landfill emissions methane (4%) are visible but consumption emissions in association with material flow analysis are the future 45%+ of footprint *Criteria needs to reflect support for net carbon reduction at NZ and global level *I support this *Best way to reduce emissions is to keep organics out of our landfill *I support this	Mostly agree Suggested changes: additional details should be added to reflect the range of emission, broader emissions impacts and climate change implications of residual waste options, reduction of emissions to "as close as zero by 2050" Comments: avoid interpretation of the ability to export emission/CO2 liability, Te Atakura may be out of date and has limitations, need to reflect support for net carbon reduction (NZ & world level)	Replacement of "support" with "align"	Agree with community stakeholder suggestions that that the largest opportunities for GHG emission reduction are in upstream waste minimisation and diversion practices, particularly concerning organic waste. The final residual waste disposal option should not be an obstacle to the implementation of effective waste minimisation. Reflects stakeholder working group support for residual waste management strategy to be connected to overall strategy to reduce waste.	Te Atakura First to Zero is WCC's blueprint for reducing greenhouse gas emissions produced in Wellington City to zero by 2050. As such, WCC's Final Waste Option should align with this ambition.
Critical			Critical			
This criteria needs a clearer definition. No disposal option supports and enables a circular economy in and of itself. The links to circular economy in terms of waste disposal are: Whether it locks the Council into continuing to generate and dispose of significant amounts of waste into the future. Whether the location and footprint of the facility impacts on the ability for the Council to put in place other infrastructure that will support the circular economy, e.g. a resource recovery park. The other way to look at it would be to consider the impacts of the construction of the infrastructure itself - earth moving, construction materials etc., and whether these align with circular economy principles. We also suggest adding wording that frames the circular economy as a system that reflects natural systems and puts the wellbeing of Papatūānuku first.	AMMENDMENT - The Final Waste Option should support and enable a transition to a circular economy, AS MUCH AS PRACTICABLE	*Circular economy is vital. The options do not support it except to provide a transition. Waste to energy might even disincentivise it *Is not in line with Māori world view and through destruction of Taonga and resources breaches Te Tiriti *Circular economy is the context, none of the options support circular economy *thing to avoid is lock in	Somewhat agree Suggested changes: define "Circular Economy" in context - waste minimisation, use of "enable" may be unsuitable, statement should include that it reflects on the natural systems and wellbeing of the Papatūānuku.	Replacement of "enable" with "support", include additional statement "that reflects natural systems and puts the wellbeing of Papatūānuku first".	The waste option will provide support for a transition to a circular economy, to "enable" is beyond the scope of this assessment. We agree it is important to define circular systems as reflective of natural systems i.e. fully circular instead of "down-cycling" systems, and take into account material as well as energy inputs.	The Final Waste Option should support a transition to a circular economy that reflects natural systems and puts the wellbeing of Papatūānuku first.
Critical			Very Important			
We support these points being actioned, however, we don't feel they fit well within the MCA process. These factors will require commitment outside of the residual waste options decision - whichever option is chosen, additional actions are required to generate these outputs/outcomes. It is critical that these matters are considered but better fit with alignment on strategic direction and conditions of resource consent sections. This criteria currently includes 3 different matters: community understanding, fly tipping and "community" waste minimisation initiatives. It is not clear to us why 'community' waste minimisation is separate to business, council or government waste minimisation initiatives. We do not feel that fly tipping is particularly relevant to choosing a final waste disposal option. One important but missing connection between these matters is around equity, ensuring that waste minimisation initiatives are affordable and accessible, and that barriers to engagement in waste minimisation are removed.	AMMENDMENT - The Final Waste Option NEEDS WIDE COMMUNITY PUBLICITY, EDUCATION AND PROMOTION TO enable and support community DIALOGUE, connection and understanding of residual waste management, and supports activities that minimise fly tipping and supports community waste minimisation initiatives.	*Faculty should pay benefits to local community Brooklyn & Owairo *The final waste options enables and supports community connection and understanding of residual waste management, and supports equitable community waste minimisation *Requirement of any solutions - needs to be part of the consultation process	Mostly agree Suggested changes: remove statement on fly tipping, change to "equitable" community waste minimisation initiatives, further inclusion of education and promotion to enable community connection and understanding of residual waste management Comments: benefits should be paid to local community, why is "community" different to business, council or government waste, current leadership/engagement is poor in whenua kaitiakitanga	Removal of "fly tipping" statement and change "support" to "is not a barrier" to waste minimisation initiatives.	Fly tipping has been determined not particularly relevant for this assessment based on feedback. The associated matter of equity will be considered though the Council's process for considering and determining future waste minimisation initiatives. Waste minimisation is outside of scope of this assessment.	The final waste disposal option enables and supports community connection and understanding of residual waste management, and is not a barrier to waste minimisation initiatives.
N/A			Important			
We agree that the disposal option needs to avoid locking us into unsustainable practices in the future. It also needs to support WCC's ambition to reduce waste and could explicitly mention the ambition under the current WMMP and likely enhanced ambition in the next WMMP. Ultimately, we want to see Council explore the pathway to eventually stop landfilling waste generated in Wellington in the future (bar a few exceptions) and use all means available to ensure that landfilling is a last resort. There is a need for an assessment of different waste minimisation scenarios in relation to the WMMP for sensitivity analysis. We believe that despite current data limitations, more modelling is required to understand the current capacity and future lifespan of the current landfill and the lifespan of the two landfill options presented. Sensitivity analysis would be a way to incorporate this as part of the MCA process, or it could be part of the checks and balances following the MCA scoring (as per the Future Waste Options report). There is an overlap with Q14 (robust and reliable) and Q17 (resilience). It makes sense to rationalise these three so each relates to a distinct point: flexibility to change in volumes and composition due to waste minimisation initiatives, resilience to shocks of various sorts and technical robustness of the option. We note that there is other infrastructure that the Council can put in place to manage short term increases in waste due to emergency situations e.g. C&D processing. Resilience needs to consider what type of waste disposal will be needed - likely to be dominated by construction and demolition waste. We also suggest adding wording that recognises that any changes to waste composition must not degrade but rather uphold the wellbeing of Papatūānuku.	SUPPORT AND AMMENDMENT - The Final Waste Option should also have SOME FLEXIBILITY BUILD INTO ITS FRAMEWORK in case of short term significant increases in waste due to emergency situations (E.G. FUTURE EARTHQUAKE/S, OTHER NATURAL DISASTERS, ETC).	*Very important, waste to energy not scalable it will encourage perpetuation of waste to production	Mostly agree Suggested changes: inclusion of "upholding the wellbeing of Papatūānuku", include "flexibility" and define emergency situations. Overlap between Resilience, Scalability and Reliability criteria.	Inclusion of examples of emergency situations in description, and relocation of second half of descriptor to Resilience criteria.	The wellbeing of Papatūānuku is considered across other criteria; not strictly related to scalability of final waste disposal option. Overlap resolved by relocation of the second half of descriptor including examples which provide clarity on emergency situations.	The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received.
Critical			Critical			

<p>We agree that WCC is better to focus on options that have a proven track record and that there is expertise in Aotearoa to support. Technical solutions must also work within te ao Māori. This means while technically mature options are preferable, innovation from a Māori world view may open new technologies that best suit the cultural and physical environments here. Just because a technology has been implemented elsewhere does not mean it is a 'success'. 'Less than 5 sites globally' seems a very low bar. 'Technical risks' often become more apparent in the medium to long term as the real impacts and consequences unfold. E.g. EU stance on Waste to Energy Incineration being inconsistent with Circular Economy objectives. Ultimately it is not clear that this criteria is still applicable given most of the previous options have been removed - unless Council was considering looking at different types of Waste-to-Energy technologies? If not, all of the options on the table are well-established.</p>	<p>We are not prepared to commit to this open ended statement</p>	<p>*Same as robustness *The two (technical & robustness) are the same as year other, both relate to same matters</p>	<p>Mostly agree</p> <p>Suggested changes: reference to applicable scale material composition, inclusion of Te Ao Māori and the Māori world view, technical solutions including mature and novel should be considers on what best suits cultural and physical environment of NZ</p> <p>Comments: same as robustness</p>	<p>No changes required.</p>	<p>This criteria considers the technical assessment of the final waste option in relation to replicability and the baseline level of risk associated with the technology.</p> <p>The cultural suitability recognizes values which are fundamentally different from the technical assessment and so may be more suitable under its own criterion.</p> <p>Stakeholder feedback re. "inclusion of Te Ao Māori and the Māori world view" relocated to separate Te Ao Māori criteria for incorporation.</p> <p>Other suggested changes are considered by other criteria.</p> <p>Ten prior examples of this technology at scale balances proven replicability of the process in different environments with retaining a desire to support innovative technology.</p>	<p>Implementing a Final Waste Option that is already established will reduce the technical risks involved. Where a technology has had 10 or more successful uses it is likely to be well understood with suitable parts, operators and expertise. Any option that has been implemented in less than ten sites globally or is still in the research phase indicates that this process is novel and so presents a higher risk for Wellington City Council.</p>
<p>Not important</p>			<p>Important</p>			
<p>Agree it is important to have a solution in place for 2026 - we understand both the void space and the consent will run out about this time. We note that viable options to reduce waste disposal prior to 2026 exist and we think these should be explored to enable void space to be preserved. We support adding some wording to this criteria to reflect this.</p>	<p>We are not prepared to commit to this open ended statement</p>	<p>*Main time frame concern for me is knowing fixed deadlines and ongoing process/development, but currently no involvement on Mana Whenua, by the time it gets to them, is it too late?</p>	<p>Mostly agree</p> <p>Suggested changes: important to have a solution for 2026 however reads as prejudgment may be viable options to reduce waste disposal prior to 2026, make statement broader</p> <p>Comments: concerns with late engagement with Mana Whenua</p>	<p>Reference to interim measure removed.</p>	<p>It is important that a final residual waste management solution is implemented prior to the consent expiration, noting that airspace in the current consented area will ruin out prior to the consent expiry.</p> <p>The default interim measure includes exporting waste, the working group indicated that this was not a desirable option as it conflicts with other concerns.</p> <p>In regards to viable options to reduce waste disposal this is beyond the scope of this assessment.</p> <p>Stakeholder feedback re. "late engagement with Mana Whenua" relocated to separate Te Ao Māori criteria for incorporation.</p>	<p>The consent for the Southern Landfill expires in June 2026 and as such the Final Waste Option will need to be constructed and operational before this date.</p>
<p>Critical</p>			<p>Very important</p>			
<p>We believe that the considerations should be wider than 'effects' for the MCA. They should consider impacts and broader outcomes for the local community. It also needs to consider facilities or places like Zealandia and schools which are part of the local community. The language currently focuses on the scale of individual people. What about the livability of the area long-term, the connection of locals to their surrounding environment? This and the following environmental criteria do not consider benefits. The focus is on minimising negative rather than accentuating positive impacts. These 'effects' criteria (8-11) should not just consider the facility itself, but also the effects of the management system overall - i.e. transport, fugitive emissions during transport and storage of waste (not just operation) etc. We also believe some community impacts are relevant to the MCA, while some are more suited to the resource consent process. For example, traffic is relevant here, but litter, odour and noise effects are more resource consent issues. Again, 'no landfill' (exporting waste) could come out well according to these criteria, but it is just transporting litter, odour and noise to another community.</p>	<p>Strongly agree</p>	<p>* Consenting issues not MCA *Yes this is consenting issue not MCA</p>	<p>Agree</p> <p>Suggested changes: wider 'effects' should be considered in this criteria, redundant as it is part of the consenting process not MCA</p>	<p>No changes required.</p>	<p>The wider impacts can be addressed within the wider Community criteria.</p> <p>Noise, odour and other community effects are not explicitly addressed in the consenting criterion and effect on local community up to or beyond consentable limits should be addressed as part of the MCA process.</p>	<p>The Final Waste Option should minimise effects on the local community, including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area.</p>
<p>Very important</p>			<p>Very important</p>			
<p>Agree this should be included. Again, this narrowly focuses on effects rather than impacts and broader outcomes. We would like to see each of these 'environmental effects' criteria (Q9-11) broadened for the MCA process to ensure that tikanga and te ao Māori are upheld, and long-term impacts and ecosystem outcomes are considered. The description makes it sound like it is just the water quality and not the broader environmental, cultural and social impacts of degraded waterways. These 'environmental effects' criteria should be consistent with Te Tiriti o Waitangi, especially Article 2 which guarantees tino rangatiratanga to hapū over their lands, waters and natural resources. For example in p.11 of the Government's recent Regulated Product Stewardship Tyres and Large Batteries consultation, it states: "Poor management of products when they become waste can damage taonga that are guaranteed protection under Te Tiriti o Waitangi – for example, through direct pollution of water, air and land, and indirectly through contribution to climate change." This relates to the wider waste management system too, in the sense that environmental effects/impacts can occur beyond the facility itself - e.g. truck movements, leakage from waste capture - and throughout the lifecycle of products and materials that become waste. The residual waste option available can influence how these products/materials move around the economy (another reason why it's hard to separate upstream activity from residual waste options), and thus the environmental effects/impacts of these broader connected elements of waste and materials management should be included.</p>	<p>STRONGLY AGREE</p>	<p>* Very important especially in relation to Te Tiriti obligations</p>	<p>Mostly agree</p> <p>Suggested changes: environmental effects should be consistent with upholding tikanga, Te Ao Māori and Te Tiriti obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). Final options should include a roadmap for replenishing, reinvigorating, and depolluting both the open and closed waterways.</p>	<p>Addition of "adverse", and inclusion of upholding tikanga and Te Ao Māori.</p>	<p>The adverse effects considered only for clarity, inclusion of the Māori world view acknowledges the broader environmental, cultural and social impacts.</p> <p>The final residual waste management option will also need to consider after closure effects and remediation as part of this dimension.</p> <p>Stakeholder feedback re. "Te Tiriti obligations in relation to ensuring tapu is protected" relocated to separate Te Ao Māori criteria for incorporation.</p>	<p>The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse effects to waterways and surrounding aquatic environments i.e. emissions to watercourses.</p>
<p>Very important</p>			<p>Critical</p>			
<p>Agree this should be included. See response to Q9.</p>	<p>Strongly agree</p>	<p>*Environmental Emissions reducers and eliminations (air, water, land) are critical in ensuring tapu is protected and the solution is not in breach of the Te Tiriti (desecration of taonga) *Very important in relation to Te Tiriti obligations</p>	<p>Mostly agree</p> <p>Suggested changes: environmental effects should be consistent with upholding tikanga, te ao Māori and Te Tiriti obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). Final option needs to show a roadmap of replenishing, reinvigorating and reintroducing natural and fragile flora and fauna.</p>	<p>Addition "adverse", and inclusion of upholding tikanga and te ao Māori.</p>	<p>The adverse effects considered only for clarity, inclusion of the Māori world view acknowledges the broader environment, cultural and social impacts.</p> <p>The final residual waste management strategy will need to consider after closure effects and remediation as part of this dimension.</p> <p>Stakeholder feedback re. "Te Tiriti obligations in relation to ensuring tapu is protected" relocated to separate Te Ao Māori criteria for incorporation.</p>	<p>The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions and contamination to surrounding land.</p>
<p>very important</p>			<p>Critical</p>			

Agree this should be included. See response to Q9.	Strongly agree	* Very important especially in relation to Te Tiriti obligations	Mostly agree Suggested changes: environmental effects should be consistent with upholding tikanga, Te Ao Māori and Te Tiriti obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). Final option must be to achieve as close to zero air emissions as current technological solutions enable.	Addition "adverse", and inclusion of upholding tikanga and Te Ao Māori.	The adverse effects considered only for clarity, the inclusion of the Māori world view acknowledges the broader environment, cultural and social impacts. The final residual waste management option will need to consider after closure effects and remediation as part of this dimension. Stakeholder feedback re. "Te Tiriti obligations in relation to ensuring tapu is protected" relocated to separate Te Ao Māori criteria for incorporation.	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions to air (including from transport) e.g. particulate or VOC emissions.
Very important			Critical			
Agree that this is a useful criteria. We suggest adding wording to consider the urgency of the issue, to reflect a willingness to go beyond the constraints of existing policies which come with existing limitations, and consider bold, brave, innovative and creative approaches.	Without wider consultation and community discussion we are reluctant to commit to answering this question the way it is worded	*Important as time is limited *is important give the time constraint, probably precludes waste to energy *lower process will have to show Te Ao Maori and Te Tiriti partnership has been worked through in relation to this	Mostly agree Suggested changes: inclusion of innovative, brave and creative approaches and a willingness to go beyond constraints of existing policies and limitations, consider the urgency of the issue and government policy, need to show work in regards to Te Ao Māori and Te Tiriti partnership as part of this process.	Addition of "and alignment with central policy direction", removal of second half of descriptor.	Government policy must be considered in line with the Council's aims and obligations, the statement has been amended to avoid ruling out suitable options which may have no track record within NZ. Stakeholder feedback re. "Te Ao Māori and Te Tiriti partnership as part of this process" relocated to separate Te Ao Māori criteria for incorporation.	The Final Waste Option should have a strong likelihood of approval given existing policies, and alignment with central policy direction.
Very important			Very important			
The aim should be to maximise value rather than minimise cost. Minimising cost is not adequate on its own - economic implications need to be considered in context. Value is a deep concept that does not relate to money alone - it needs to be considered from an intergenerational perspective, and should prioritise the restoration of the wellbeing of Papatūānuku as a core value. Even the concept of 'value for money' should attempt to account for externalised costs to the environment and community, though the methodologies for doing this are likely underdeveloped. Value for money is about the optimum combination of fitness for purpose and whole of life cost. It is not clear who the cost will be minimised for - only in terms of WCC budgets or best value for Wellington City as a whole including businesses and households paying user charges and gate fees? 'Cheap' options often come with hidden costs and/or push cost and risk out into other parts of the system. A broader framing of value enables opportunity cost to be considered. There is a need to do this so that we have transparency about what Council is choosing not to invest in or enable by picking specific options, e.g. the opportunity costs of continued reliance on disposal over lost local economic development and jobs in waste reduction and minimisation. 'Recycled products' is not an appropriate aspect to include given the options left.	Minimising environmental impacts is more important. That said, there would be a fair expectation that better technology, increased efficiencies would bring costs down long term		Somewhat agree Suggested changes: expansion on assessment measures used or simplification of statement, inclusion of the intergeneration perspective and restoration of the wellbeing of Papatūānuku Comments: funding options need to be considered for the life of the option, aim to maximise value rather than minimise cost, need to account for externalised costs	Addition of consideration from an intergenerational perspective	Agree with community stakeholder assessment that this criterion needs to provide value for money for Wellington City ratepayers, while enabling intergenerational cost perspective. This has been integrated as accounting for externalising past/future costs, this includes having financial reserves in place for rehabilitation after closure and ensuring wellbeing for future generations. Stakeholder feedback re. "restoration of the wellbeing of Papatūānuku" relocated to separate Te Ao Māori criteria for incorporation.	The Final Waste Option should provide overall value for money for Wellington City ratepayers and ensures any financial investments takes into account intergenerational costs considerations.
Slightly important			Important			
This is related to Q5 and Q17. Some overlaps between scalability, technical reliability/robustness and resilience need to be resolved. This criteria seems to relate to the ability of the disposal option to adapt to changes to waste content in an emergency or exceptional circumstances, and ability to handle hazardous or unusual materials that cannot be processed elsewhere. We note that there is other infrastructure that the Council can put in place to manage short term increases in waste due to emergency situations e.g. C&D processing. We would assume that any disposal option chosen would be fit for purpose and functional.	Agree	*Same as technical maturity *The two (technical & robustness) are the same as year other, both relate to same matters	Mostly agree Suggested changes: removal of 2nd statement Comments: overlaps between scalability, technical maturity and resilience	No changes required.	The final waste option must have the capability of the system to operate consistently when required.	The Final Waste Option should be robust and reliable enough to handle changes in incoming waste content, and any equipment should be available and online for as close to 100% of its required operational hours as possible.
Very important			Very important			
Not needed. This Question is only relevant if the disposal option is generating a "product". The Pre-sort options have been taken out of the list so no longer relevant.	As this appears to be the case currently, we see this likely to continue into the foreseeable future	*No longer relevant as only looking at disposal options (no marketable product) *I agree	Somewhat agree - may not be relevant if no marketable product is produced Comments: consideration of community based resource recovery solutions, would require an economic plan in line with OBRA's vision	Remove criteria.	This criteria is no longer relevant to the final waste options as there will be no marketable product.	
N/A			Very important			
Is this needed? Has the work done to date has already ascertained this? If such a criterion is used, it should also consider how it relates to a wider network view of satellite and decentralised waste minimisation and recovery sites/hubs throughout the city, and is designed to integrate into that network.	It is assumed by the term site, it is the whole WCC engineered landfill (currently used and potential sites to be used for new stage/s) area not just the existing stages, then yes.	*Less relevant now that *The waste to energy is a regional solutions, too big for Southern landfills	Somewhat agree Suggested changes: may be a limiting constraint, regional solution size is beyond Southern landfill, statement should include of network approach (decentralisation and integration)	Addition of commentary of wider waste network.	Practical criteria as the Southern Landfill has been designated under the district plan as such the wider network view has been integrated into this statement. For the waste to energy option it is conceptualized on a Wellington City scale.	The Final Waste Option should be able to fit within the existing site, or be able to integrate into existing waste network.
Not important			Important			
This is related to Q5 and Q14. Some overlaps between scalability, technical reliability/robustness and resilience need to be resolved. Apart from the need to emphasise the compatibility of the option with an ambitious waste minimisation programme (Q5), these points otherwise relate to risk associated with disruption to services and ability to access the disposal option. This one seems to be about the availability of the facility itself due to civil emergency type events due to earthquake, Tsunami etc., although reliability (Q14) considers some of these issues too.	This assumes flexibility it disposal methods and types, so agree	* Key for earthquake, etc, having capacity, flexibility, peaks & troughs *Scalability and reserved capacity for the future event, resilience also required	Agree Comments: overlaps need to be resolved	Integration of content removed from Scalability criterion.	Provide greater clarity and reduces overlap with Scalability criterion.	The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations (e.g. earthquakes or other natural disasters). This will consider day-to-day waste transport corridors including whether the option is based locally or outside the Wellington region.
Very important			Very Important			

<p>Having a single criteria relating to Te Tiriti and partnership options does not seem like a useful approach to us. This needs to be considered as an overarching obligation, which must inform all subsequent systems and proposals, to uphold the commitments in Te Tiriti, and ensure long term resilience and wellbeing of taiao and whakapapa for tangata whenua. Responsibilities and consequences need to be embedded into all of the criteria - in particular the 'environmental effects' criteria, Q9,10,11. We see council's Tiriti relationship covering more than just 'consultation' with mana whenua on a proposed course of action. Council also needs to separate out the various strands of obligations and considerations: 1. Partnership with mana whenua - embedded in long term relationship 2. Te Tiriti articles - WCC responsibilities in relation to these 3. Te Tiriti principles 4. Te ao Māori - worldview 5. Mātauranga - practical wisdom and knowledge</p>	Agree		<p>Comments: Core, overarching criteria/obligation which needs to be set in conjunction with local Iwi, which informs all subsequent systems and proposals. It is critical to align with te ao Māori and uphold the commitments in Te Tiriti as it informs all subsequent systems and proposals, must reflect the changed palate of the community which are culturally and socially sustainable not just business focused. The council has obligations and considerations to uphold in regards to their partnership with Mana Whenua, Te Tiriti, Te Ao Māori and Mātauranga.</p> <p>Comments relocated from other criterion: * The technical maturity criterion considers the technical feasibility within the physical parameters of NZ, but it is also important to consider the cultural suitability of different option. WCC recognizes there are te ao Māori-specific values which are not explicitly covered in other criteria so have discussed capturing these in a separate criterion. * In regards to timeframe there are concerns regarding engagement with Mana Whenua. * In relation to adverse environmental effects on land, air and water, this should be consistent with upholding Te Tiriti o Waitangi obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). * Within the consenting and planning process work needs to be shown in regards to Te Ao Māori and the Te Tiriti partnership. * In terms of Value for Money the final waste option should invest adequately into the restoration of the wellbeing of Papatūānuku.</p>	All relevant feedback summarised in new criteria	<p>Wellington City Council recognises the significance of Te Tiriti and its own obligations and commitments to the principles contained within.</p> <p>We agree with the community stakeholder assessment that this is a core criteria and overarching obligation that must inform all subsequent systems and proposals. WCC has endeavoured to integrate this viewpoint into the design and construction of all criteria.</p> <p>We have determined that some feedback and recommendations identified within the community stakeholder assessment of other criteria, including: - the importance of preserving and restoring wellbeing of Papatūānuku, - the need for an assessment of cultural suitability of the option, and - the need for partnership with Mana Whenua, are more appropriate for integration into this overarching criterion.</p>	The Final Waste Option should uphold Te Ao Māori and uphold the commitments of Te Tiriti o Waitangi, to ensure the protection of tapu, the wellbeing and restoration of Papatūānuku, and provide options which are suitable for the physical and cultural environment of Aotearoa. As part of this, a strong partnership with Mana Whenua must be embedded within the foundation of the option.
Critical			Critical			
<p>1. The Final Waste option must align with Council's strategic principles and priorities. Council has a clear set of strategic goals and outcomes as well as specific relevant plans and targets that need to be considered, and the national policy and strategic context set by central government must also be considered. We would expect this type of analysis to be done as a matter of course in any specific council decision making process, but feel that this should be emphasised when considering options. 2. Human health impacts do not appear to be specifically included in any of the criteria. This may be implied in the environmental effects criteria as flow on consequences for humans, but it would be useful to include a specific criteria for this.</p>			<p>* Criteria regarding Te Ao Māori should be first * Criteria for human impacts should be added * When considering options emphasis on alignment with Council's strategic principles & priorities.</p>	No key themes or required changes from these comments.	Human impacts are assessed in environmental impact and community impact statements; council's aims considered in a number of criteria.	
Critical, Very important						
<p>Do not support. This option does not incentivise the Council to reduce waste volumes, it is high cost, requires significant earthworks (with their own environmental costs), environmental impacts associated with encroaching on undeveloped land, large parts of regenerating native forest in the valley will be destroyed, and may create additional problems for Zealandaia in the form of litter.</p>	To GBRAI this has always been the most likely solution		<p>Mostly do not support</p> <p>Comments: May provide time for developing technologies, however may not be the best use of funds and may not incentivise waste reduction. Concerns regarding increased wind blown pollution resulting in odour, increased pests & risk of breaches (Zealandaia), costs, environmental & ecological impacts. Further assessment of impacts required.</p>			
<p>Strongly support. This option seems most consistent with an ambitious waste minimisation action plan going forward, provided that sites for greenwaste composting and resource recovery facilities can be found. We do have concerns that this option does not remove the continued reliance on the current stream diversion tunnel or mitigate the consequences of a tunnel collapse and the resulting accidental lake forming north of the existing stage 3 landfill. We would like to understand if the waste team and engineering consultants have looked at the potential to mitigate these consequences at the same time. We would like to understand if there is the possibility for a piggyback option with additional engineering work that also mitigates the risk of tunnel collapse.</p>	To GBRAI this is an interesting newer option, but without some better financial breakdowns between the stage 4 and the "piggy back option"- and future cost options when the piggy back is filled - we are reluctant to comment		<p>Mixed - some strong support as opposed to the landfill extension. Preference for Interim extension for WMMP decision making on waste volumes/types.</p> <p>Comments: concerns regarding relocation of composting operations and further assessment required of cost breakdowns, stream/tunnel collapse mitigation and impacts of annual waste volume reduction.</p>			

<p>Strongly do not support. This option is least consistent with an ambitious waste minimisation plan. We agree with and support the Zero Waste Network's position on Energy from waste/Waste to energy technologies: https://zerowaste.co.nz/waste-to-energy-incineration/</p>	<p>Unrealistic. Wellington/greater Wellington is not large enough as a metro area, this system perpetuates waste creation to keep the incineration plant in operation, is hideously expensive, while it creates energy it creates its own waste, and is viewed as incompatible with the waste minimisation process we as a country and a city/region are on</p>		<p>Strongly not supported as a residual waste option - may be considered at an upstream level</p> <p>Comments: similar waste disposal solution rejected by EU, challenge with fitting it into a circular economy, concerns regarding waste burnage, final waste volume, efficiency, cost, site footprint, perpetuation of waste creation rather than reduction, along with an incompatibility with the NZ and city/regional waste minimisation process</p>			
<p>Support as longer term goal - 20 years, following piggyback option and rapid reduction of landfill waste. However, we do not have enough information or know if sufficiently detailed analysis has been done to properly comment on whether this should be an option to consider or not, particularly for the short term but also longer term. We think that a holistic, regional view is needed to better understand existing and future infrastructure asset needs to ensure capital investment is spent in the right way.</p>	<p>Unrealistic, other areas will become reluctant/oppose metro wellingtons waste being exported and filling their landfills. costly, inefficient, does not encourage waste minimisation and likely to be blocked by locals in the area waste is being sent to.</p>		<p>Mixed - but mostly do not support as a current option, but instead support as longer term goal (~20 year) after landfill waste reduction/following piggyback option.</p> <p>comments: Limits city control on waste, increases costs, inefficient and does not encourage waste minimisation (shifts issue). Possible extension beyond Wellington region, however reluctance/opposition of waste exports to other landfills.</p>			
<p>We want to see the following points as part of framing the options for consultation: 1. Conditions must be attached to any landfill option so that the consent supports landfill being a destination of last resort. 2. Any option needs to be set within the context of a strong revised WMMP with associated financial resources for implementation. 3. Council should continue to consider if there are any other potential short term trade-offs, such as a complimentary alternative treatment option for some of the sludge, following appropriate consultation with mana whenua. We would also welcome official Council engagement with novel and complementary approaches to reducing sewage sludge, as were explored during the recent Beyond the Pipes Symposium at Greater Wellington Regional Council. 4. Recognising that this is outside of the control of the waste operations team, Council should seek to use their influence to improve practices at the other landfills in Happy Valley. The C&D landfill is on Council leased land, we request that Council use their influence and engage with the operators to ascertain what is planned and what could be achieved collaboratively.</p>	<p>It is somewhat frustrating that the discussions to date have circled around - and come back to - the stage 4 expansion of the Southern Landfill. The incineration & trucking wellingtons waste elsewhere have been previously discussed and dismissed by both the Community Liaison Group (WCC, Greater Brooklyn Residents Association Inc, Owhiro Bay R/A) and the wider community who has been keeping a close eye on the landfill(s) operations a number of years ago. There have been missed opportunities over the last three to five years or so to progress sensible, direct and honest discussion about the WCC landfill extension. This groups two meetings to date have, candidly, barely moved discussions forward - but I will acknowledge they have moved forward - as the terms of reference and initial agenda have been, to be diplomatic, confusing and not up front. We are looking beyond these discussions to a wider community engagement and hope WCC remains committed to continuing real and genuine community and waste industry engagement</p>	<p>the questions do not appear to have any Maori lens across them limiting the potential exciting and innovative solutions & approaches to the questions/issues proposed</p>	<p>* Statements/questions lack a Māori lens limiting potential innovative solutions and approaches. *Conditions should be attached to any landfill option so that consents support landfills as a last resort destination *Options set within the context of a strongly revised WMMP *Council should continue to consider if there are other potential short-term trade-offs</p>			

D

Appendix D – Final Waste Option Carbon Assessment

WCC Final Waste Option Carbon Assessment

Prepared for Wellington City Council
Prepared by Beca Limited

26 January 2022



**make
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Revision History

Revision N°	Prepared By	Description	Date
A	Jack Timings	Issued for Approval	08/10/21
1	Jack Timings	Updated as per WCC Comments	13/10/21
2	Jack Timings	Revised for Updated Option List	26/01/22

Document Acceptance

Action	Name	Signed	Date
Prepared by	Jack Timings		26/01/22
Reviewed by	Eleanor Grant		26/01/22
Approved by	Nathan Baker		26/01/22
on behalf of	Beca Limited		

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Executive Summary

The Wellington City Council (WCC) owns and manages the Southern Landfill. It is considered a key infrastructure for the city, and is listed as a strategic asset in WCC's Significance and Engagement Policy, as required under the Local Government Act 2002 (LGA). The landfill operates under a resource consent issued by the Greater Wellington Regional Council.

With the current landfill consent expiring in April 2026, and capacity expected to be reached at the same time WCC is assessing alternative waste management technologies after the current consent expires.

Beca and Fichtner were engaged by WCC in 2021 to perform a technical and suitability assessment of a long list of possible residual waste management solutions (including extension of the current landfill) for WCC to implement post-2026, and evaluate the relative advantages and disadvantages of applying each technology in a WCC context.

After the original report was delivered to WCC in late 2021, Beca was engaged by WCC to produce an updated assessment of technologies specifically targeting post-recovery residual waste, referred to in this report as final waste options. The key difference between these two types of waste solutions is that options that extract and divert or minimise wastes prior to the final waste being sent to another location are not final waste options, since they are an intermediate step before the residual waste is finally sent somewhere else.

The options remaining to be assessed by this process are as follows:

1. An extension to the current Southern Landfill;
2. A new Energy from Waste plant (EfW);
3. Export of Wellington City's waste to other regional landfills.

To support its analysis of the final options, Beca was commissioned to complete an assessment of the carbon emissions impacts of each of the options. This assessment considered the whole of life carbon emissions impacts of each option, including construction and operation of the facility.

Methodology

To conduct this analysis, we first went through a process of identifying all of the carbon emissions sources related to the option. See below for an example for the Energy from Waste facility. To estimate the total whole-of-life emissions associated with this option, we are assessing:

- The emissions associated with construction the facility, and expanding offsite landfills to cope with the residual wastes from the facility as well as incompatible wastes generated in Wellington City (**embodied emissions**)
- The emissions generated by transporting the treatable waste to the facility as well as transporting residual wastes and incompatible waste streams offsite, and emissions abated by supplying electrical energy to the grid (**operational emissions**)
- The emissions that could be avoided by using the residual products to displace virgin material manufacturing costs (**avoided emissions potential**)

These three categories are the basis of our estimates for all options.

For each option we have also noted possible sources of emissions that are out of scope of our analysis. Potential emissions sources in the "Out of Scope" category have been excluded either due to insufficient data or an inability to quantify them. Please see below for the diagram of the above information for the Energy from Waste facility:

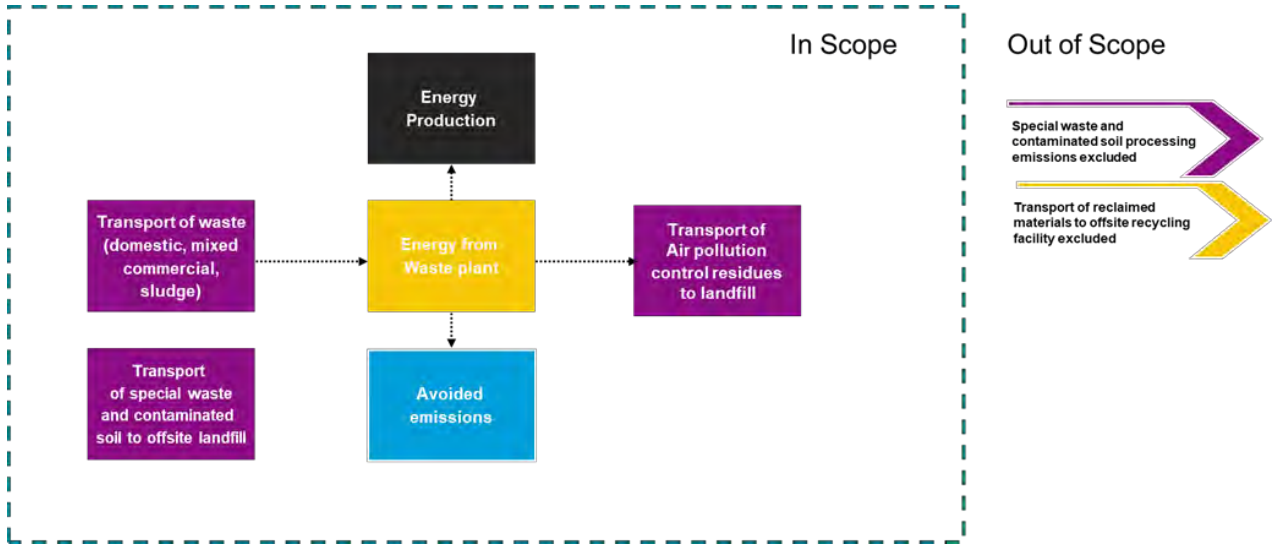


Figure 1: Scope of Carbon Emissions Analysis for Energy from Waste Facility (example)

To estimate the carbon emissions associated with each aspect of the option, we used emissions factors provided by a number of accredited national and international organisations (including NZ’s Ministry for the Environment, Motu spend-based emission factors, US EPA, UK Government and the Infrastructure Sustainability Council) and applied these to previously-presented cost estimates and energy/material balances from the original report.

The different sources for emissions factors and the different types of input for our analysis (estimated capital spend vs. material quantities vs. transportation distances etc.) all come with differing levels of accuracy and therefore it is not necessarily appropriate to quantitatively summarise results between sections of this report. We have qualitatively assessed the overall whole of life carbon below.

Findings

Our analysis demonstrated that when the combination of operational and embodied emissions are considered, there are no significant differences between the options. Across all options, the contribution of operational emissions to the total lifecycle emissions far outweighs the contribution of the embodied emissions associated with the facilities construction. Please see Figure 2 for a summary of our findings:

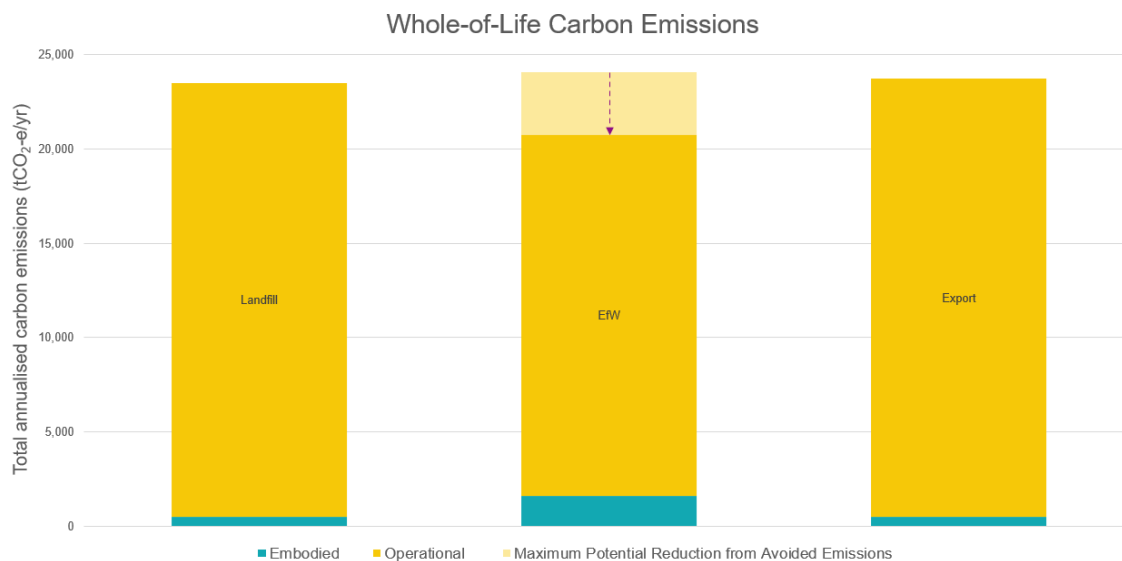


Figure 2: Whole of Life Carbon Impact Summary, Including Possible Emissions Avoidance

It should be noted that these Whole of Life figures are based on three separate contributing sources of carbon emissions (embodied, operational and avoided emissions potential) which have all been quantified with different levels of accuracy. Additionally, because of the assumptions made when developing the scope of these assessment, these emissions summaries are comparative only and should not be used when comparing these options to other emissions abatement opportunities outside the scope of this assessment.

The Energy from Waste (EfW) facility presented opportunities for material streams to be reclaimed and diverted from landfill, which creates a possibility for these options to have downstream emissions abatement impacts on material production operations. However, these abatement opportunities are hard to quantify accurately and likely will only be achieved in part as there are many external factors that will affect the viability of successfully diverting these materials from landfill. Additionally, they do not address the source of the options' operational emissions, but rather abate emissions out of WCC's operations in a broader circular economy.

Discussion

Our analysis has shown that for each option the carbon emissions over the whole of life does not significantly differ between the options, and that there are few carbon emissions benefits from choosing between these different options in a local New Zealand context.

The greatest opportunity WCC has to affect the whole of life carbon emissions associated with any of the chosen options is to reduce the amount of waste produced, with a focus on organic material in its residual waste stream. This is being separately investigated by WCC via their Strategic Waste Review through waste minimisation and waste diversion programmes.

1 Introduction

This report presents the indicative carbon assessment of the shortlisted waste treatment options. Beca Ltd (Beca) was commissioned by Wellington City Council (WCC) to undertake this assessment (Scope).

The Wellington City Council (WCC) owns and manages the Southern Landfill. It is considered key infrastructure for the city and is listed as a strategic asset in WCC's Significance and Engagement Policy, as required under the Local Government Act 2002 (LGA). The landfill operates under a resource consent issued by the Greater Wellington Regional Council.

With the current landfill consent expiring in April 2026, and capacity expected to be reached at the same time WCC is assessing the possibilities presented by alternative waste management technologies after the current consent expires. Beca and Fichtner were engaged by WCC to perform a technical and suitability assessment of a long list of possible waste technology options for WCC to implement post-2026, and evaluate the relative advantages and disadvantages of applying each technology in a WCC context. In October of 2021, the initial assessment of possible options for residual waste treatment in Wellington City was completed, and a report published to support public consultation on the shortlisted options.

As a key decision criteria for WCC in the context of its Te Atakura First To Zero strategy, and to support the evaluation of these options by Wellington City Councillors and public stakeholders, Beca was further engaged by WCC to provide additional carbon commentary on the options.

This commentary examined the embodied capital carbon associated with the construction of any new waste management facility, as well as the operational emissions associated with running the facility over its lifetime. The methodologies employed to analyse these two measures are explained in the following sections.

This assessment has only explored carbon emissions and has not assessed wider metrics such as lifecycle assessment, any other specific environmental factors or wider social and cultural factors such as public perception.

2 Scope of Carbon Assessment

As part of this assessment, we have categorised the emissions sources related to each option into three categories: Embodied/Construction emissions, Operational emissions and Avoided emissions.

Table 1: Summary of Emissions Analysed by Type




Emissions category	Definition	Example	Certainty
Embodied / Construction	The emissions associated with constructing each option.	Including concrete, steel and any other building materials as well as the diesel used in excavators etc.	
Operational	The emissions associated with the day to day use of the waste processing plant.	Electricity usage, transport and the emissions from the breakdown or combustion of waste	
Avoided	Are the emissions displaced through the downstream benefits taking a whole of world view.	Associated with the avoidance / displacement of new virgin material because further material content is been recovered and re-used.	

Table 2 - simple definition of each emissions type and certainty of the calculation method

This colour coding illustrates the level of accuracy behind the emissions calculations completed for each of these categories.

- Embodied emissions has a medium level of accuracy as the calculations are based on estimated CAPEX spend for each waste management option. This spend has a -20% to +35% accuracy and this is reflected in the embodied carbon estimates.
- Operational emissions has a medium-high level of accuracy as inputs for carbon calculations are derived from work completed in the previous “Future Waste Management Options” report.
- The avoided emissions have a very low level of accuracy as the amount of waste that could be diverted is highly dependent on various external factors such as there being a market for these contaminated materials to be recycled. The likelihood of these emissions being avoided is unknown and the figures presented are based on a best case scenario.

The following chapters will discuss our analysis on each of these three dimensions before providing commentary on how each option compares when considering all three of these emissions categories together i.e., in a “Whole of Life” context.

There are also sources of emissions we have not been able to quantify or cannot quantify given the complexity of factors outside of WCC’s control. For a diagrammatic representation of which emissions sources have been included and excluded in our analysis, please refer to the section below.

2.1 Shortlisted Options and Carbon Boundaries

The scope of this exercise has focused on:

- The embodied emissions associated with the construction of each waste management facility (denoted by the yellow boxes),
- estimated operational emissions of these facilities (denoted by purple, black and grey boxes), and
- avoided emissions (light blue boxes).

Boundaries (denoted by the dotted turquoise lines) have been defined around this scope and all emission sources that have been excluded sit outside of this boundary. Rationale behind the boundaries that have been set have been provided for each waste management option.

For all options it has been assumed that the landfilling of special waste and contaminated soil has no emissions as the composition is inert.

For further information on any of these options, including information on non-carbon advantages and disadvantages, please review the previously issued “Future Waste Management Options” report, completed by Beca for WCC.

2.1.1 Landfill Extension

WCC has proposed two options for extending the current Southern Landfill. The first option is a ‘piggy-back’ extension of the existing landfill which has an anticipated lifetime of ~15 years. The second extension is a full 30 year extension. In this analysis, we will be focusing on the full 30 year extension which is an equivalent option to the other options presented.

The landfill extension will allow the current Southern Landfill site to continue receiving Wellington City’s waste for the next thirty years, including hazardous and special wastes. The capital development of the landfill will be staged over a number of years as the requirement for landfilling space continues over time.

The focuses of our emissions estimation for this option are given below:

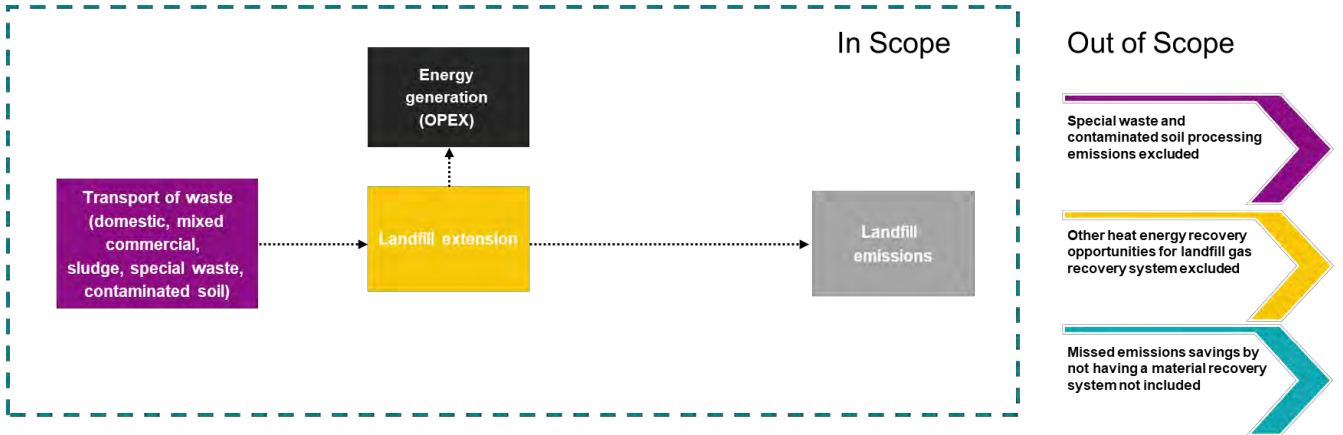


Figure 3: Landfill Extension Emissions Sources - In and Out of scope

The main sources of emissions for this option, aside from embodied emissions when constructing the facility are transportation and landfill gas emissions.

In extending the landfill there are missed emissions savings possible by not having a recovery system that redirects material to be recycled. This quantification has not been included in the landfill extension emissions portfolio. We have assumed that the landfill will be able to capture a portion of the gas generated via the decomposition of organic material in sealed landfill cells, and use this gas to generate electricity to sell back to the grid.

2.1.2 Energy from Waste (EfW)

Energy from Waste plants are commonly employed in Europe and the UK as a way to handle domestic and commercial refuse, and produce electricity. The installation of an EfW plant to handle Wellington City’s waste would be on the lower limit of achievable scale for a plant. The facility could receive all domestic and commercial waste generated in Wellington City, as well as WWTP sludge. However, special waste and contaminated soil would not be able to be processed.

The focuses of our emissions estimation for this option are given below:

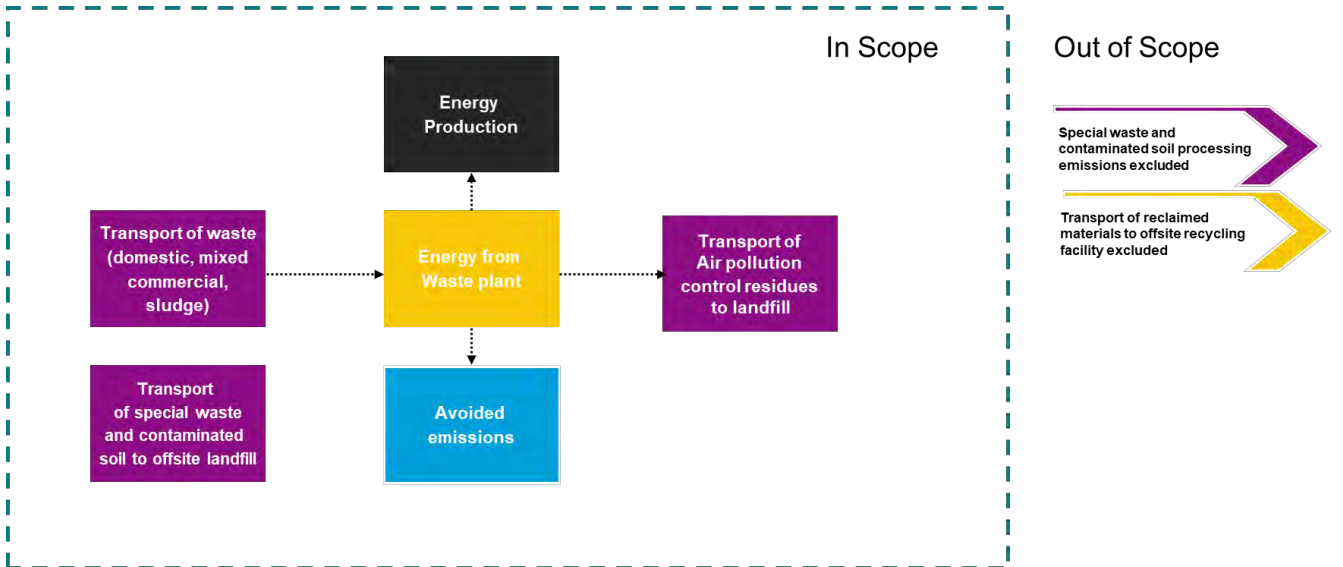


Figure 4: EfW Emissions Sources - In and Out of Scope

The main sources of emissions for this option, aside from embodied emissions when constructing the facility are transportation and combustion emissions. The plant will produce electricity which can be supplied back to the grid and offset emissions from grid-average electricity.

It has been identified that the bottom ash from the EfW plant could be repurposed as a supplementary cementing material (SCM) which would displace additional virgin cement in concrete production. This has been classified as the 'avoided emissions' for the EfW plant. The transportation of the bottom ash from the plant to a cement batching plant in New Zealand has not been quantified in this assessment.

2.1.3 Offsite export

Waste export to alternative regional landfills represents the low-capital waste management option for WCC, and while from a WCC Scope 1&2 emissions point of view this option may seem appealing, the broader emissions impacts are not as straightforward.

The focuses of our emissions estimation for this option are given below:

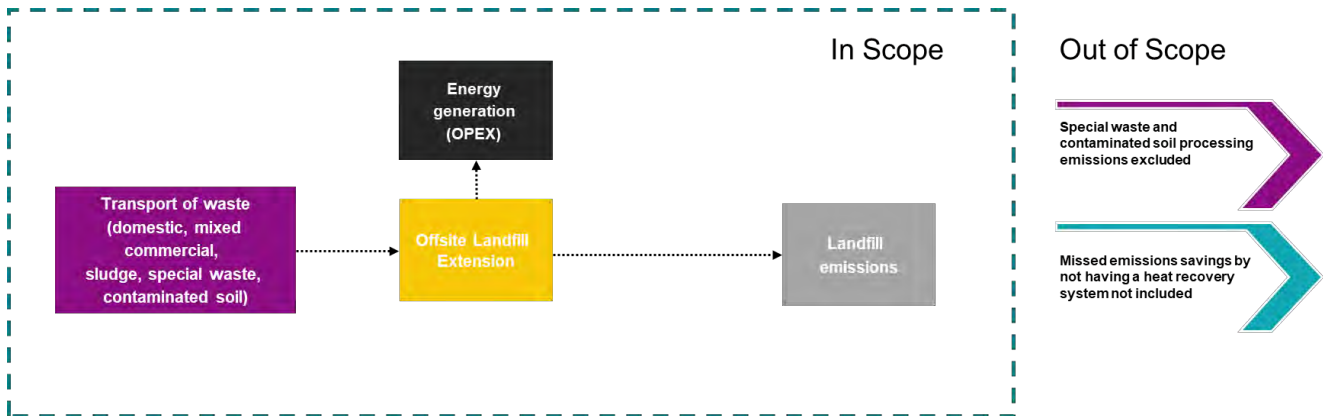


Figure 5: Waste Export Emissions Sources - In and Out of Scope

The exclusions for the waste export to an offsite landfill is the same as the full 30-year landfill extension. Please note that this also includes the embodied/construction emissions associated with creating this additional landfill capacity. We have included this as even if this happens outside of the WCC's operational control, these emissions need to be accounted for when the global emissions perspective is considered.

We have assumed that offsite landfilling alternatives to the Southern Landfill will be equipped with equivalent gas capture and electricity generation equipment.

3 Indicative Embodied Carbon Assessment

3.1 Methodology & Boundary of Analysis

3.1.1 Spend Method

The method used to calculate the embodied carbon of each option is a simple spend based method, that helps identify the order of magnitude between the options, providing an indication of total embodied carbon.

The spend database¹ used is one of the few that has been developed specifically to use New Zealand Dollars (NZD) but does have limitations in its use for large commercial projects due to its age and primary purpose. Its key advantage is the speed/cost to which the assessment can be undertaken compared to a process using material quantities. Each solution does not have a detailed estimate of required materials yet, due to the concept level only development of the cost estimates.

¹ Motu spend based emissions factor 2014/15 http://motu-www.motu.org.nz/wpapers/14_05.pdf

3.1.2 CAPEX data

Beca has used the capex costs from the “Future Waste Management Options” report. This included the breakdown of total costings into various CAPEX spend categories for each option. These costings have been applied to the New Zealand specific spend-based emissions factors to estimate embodied emissions of building each facility.

Estimated CAPEX spend was provided by WCC for the landfill extension at WCC’s existing landfill site. The same spend based emissions factor database was applied to the CAPEX estimates. The cost estimates for landfill extension has some more granular detail than that of Energy from Waste.

An assumption has been made that if waste or residual material from one of the waste processing facilities is transported to an alternative regional landfill, this will lead to an eventual expansion of this alternative regional landfill to take on this additional load from Wellington City. This has been hashed in the diagrams below as this falls outside of WCC’s operational control and it is unknown when this expansion will occur. It has been estimated that these emissions will be the same as those associated with extending WCC’s existing landfill. This is to help avoid perversely incentivising an option that would create significant emissions leakage from the Wellington region to another council/contractor operated landfill facility.

3.2 Results

The results of the indicative embodied emissions estimations per waste management option suggest that the Energy from Waste plant has the highest embodied emissions associated with the construction of the facility. After inclusion of embodied carbon associated with the expansion of regional landfilling infrastructure, the lowest emissions option is the landfill extension or waste exporting.

It is worth noting that these facilities are likely to be constructed over a multiple year time period therefore, if reported by WCC’s annual emissions inventory these figures would spread over 2-3 years (with the exception of the alternative regional landfill option).

The accuracy of the cost estimates is not expected to be better than approximately -20% to +35%. Therefore, embodied emissions have been provided in ranges to account for this level of uncertainty. Please note there will also be a margin of error associated with the emissions factors; this hasn’t been factored in the ranges reported below.

Table 3: Embodied Emissions Summary

Option	Base Embodied Emissions (tCO ₂ e)	Embodied Carbon for Expansion of Regional Landfill Infrastructure (tCO ₂ e)	Total Embodied Carbon (tCO ₂ e)
Landfill Extension	12,300 – 20,700	0	12,300 - 20700
Energy from Waste (EfW) facility	34,200 – 57,700	4-800 – 8,100	39,000 – 65,800
Waste Export	0	12,300 – 20,700	12,300 – 20,700

The figure below summarises the embodied emissions (both Base Embodied Emissions and Embodied Carbon for Regional Infrastructure) with ranges of accuracy displayed:

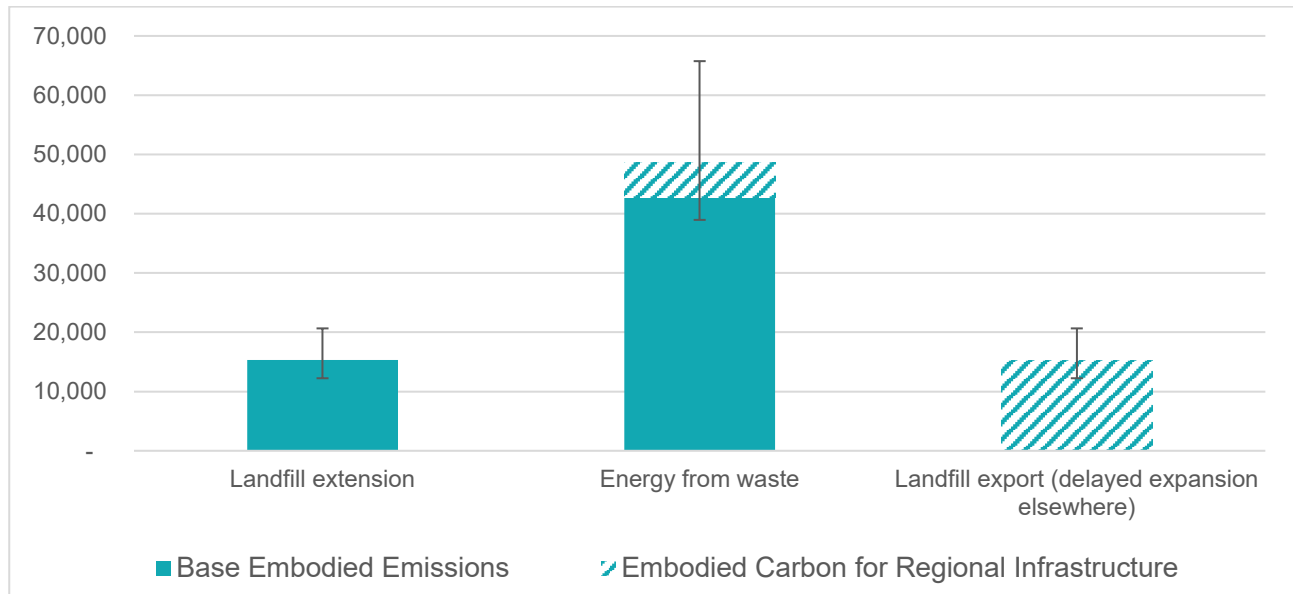


Figure 6: Average embodied emissions comparison for each waste management option based on CAPEX costings.

4 Operational Carbon Assessment

4.1 Methodology & Boundary of Analysis

To analyse the operational emissions of each shortlisted option, we have considered the following sources of emissions across each option:

- Transport emissions associated with collecting and moving waste between Wellington City and different disposal sites
- Biogenic methane emissions from the decomposition of organic material in a sealed landfill, assuming landfill gas capture is present
- Combustion emissions (for the Energy from Waste option only) for both the organic and anthropogenic wastes present in the combustion stream
- Emissions associated with electrical consumption of the proposed facility, and avoided emissions if the facility is a net energy generator.

4.1.1 Sources for Material Quantities and Distances

Our analysis for the options is primarily based on engineering work and data collected for our previous report prepared for WCC, “Future Waste Management Options”. In this report, we analysed annual tonnages of waste by category and volume received at the Southern Landfill based on the most recent three years of collected data, and completed energy and material balances of the options to describe quantities of material streams treated/diverted and generated if applicable. This report also estimated the amount of electrical energy required to power any processing equipment, if applicable.

There is a level of uncertainty associated with these figures as they are averages of variables that vary significantly with time.

Transportation distances, both from Wellington City to the Southern Landfill site and to other regional landfills that could receive generated waste were provided by WCC as part of the previous report.

4.1.2 Sources for Emissions Factors

To quantify these emissions, our first source of information for relevant emissions factors for these four sources of emissions in a New Zealand context was the Ministry for the Environment's detailed guide for measuring emissions^[2].

The only analysis that we were not able to complete solely using the Ministry of the Environment guidance was the estimation of combustion emissions for organic and anthropogenic wastes. To complete this analysis, we used the U.S. Environmental Protection Agency (Office of Resource Conservation and Energy)'s Waste Reduction Model^[3], particularly the chapters on 'Containers, Packaging, and Non-Durable Good Materials', and 'Organic Materials'.

Both sources of emissions factors detail the approximate levels of accuracy associated with individual factors. These factors are not specific to WCC's own landfill or operations, and there is a level of uncertainty present when applying these general factors to WCC's current and/or future operations. These factors are based on average historical data from typical landfills/truck fleets/electricity grids, so are not tailored to the individual conditions present at WCC's current operations and will not reflect changes in operation of the analysed assets over time

4.1.3 Biogenic vs. Non-Biogenic CO₂ Emissions

In both the Ministry for the Environment and Environmental Protection Agency guidelines, carbon dioxide emitted from the combustion of biomass or material with a biogenic origin (e.g. timber, paper, WWTP sludge) is not accounted for in the emissions factors presented. The emissions factors for biogenic materials still include an allowance for methane and nitrous oxide generation during the combustion process.

This approach, based on guidance from the IPCC^[4], assumes that generation of the materials being burned is removing an equal quantity of CO₂ from the atmosphere, so the fuel is essentially carbon-neutral if sourced from sustainably-managed forestry or other similar sources. Conversely, the extraction of fossil fuel, processing and combustion of anthropogenic materials like plastics adds previously-sequestered CO₂ back into the atmosphere and this additional carbon cannot be easily removed.

What this means for our analysis is that in options where organic materials are burned rather than landfilled (where they would produce methane under anaerobic conditions), the reported carbon savings are significant. In this scenario, no methane is generated by the organic materials decomposing underground, and instead only small quantities of non-CO₂ greenhouse gases (nitrous oxide etc.) are generated. This is not the case for anthropogenic materials like plastic or man-made textiles which require additional petrochemical carbon to produce, and the CO₂ produced by the combustion of the material cannot be converted back into the original product.

² "Measuring Emissions: A Guide for Organisations: 2020 Detailed Guide" (2020); <https://environment.govt.nz/assets/Publications/Files/Measuring-Emissions-Detailed-Guide-2020.pdf>

³ *Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM)* (2020); <https://www.epa.gov/warm/documentation-waste-reduction-model-warm>

⁴ *IPCC Guidelines for National Greenhouse Gas Inventories* (2006); <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html>

4.2 Options Analysis

4.2.1 Landfill Extension

An extension of the current Southern Landfill would have little impact on WCC's current operational emissions. All waste currently received at the Southern Landfill would still be able to be processed, and as with the current landfill the primary sources of emissions associated with operating the facility would be:

- Landfill gas emissions from decomposing waste sent to landfill
- Transport emissions from transporting Wellington City's waste to the landfill site.

Of these two sources of emissions, the dominating source of emissions by far is emissions from landfill gases. In our calculations we have assumed that an extension to the Southern Landfill would be equipped with landfill gas capture equipment to capture and generate electricity from the majority of landfill gas produced.

4.2.2 Energy from Waste Plant

An EfW plant would have the most drastic overall effect on the makeup of total emissions from any chosen waste management option. In an EfW plant, the sources of emissions and emissions abatement to consider are:

- Transport emissions associated with collection of the combustible wastes (domestic waste commercial waste, WWTP sludge), as well as transportation of non-treatable waste (contaminated soil, special waste) and hazardous ash residues to other regional landfills
- Combustion emissions from burning organic and non-organic wastes
- Emissions avoided by the generation of electricity and displacement of grid-averaged electricity, based on the current (2018 MfE) grid carbon intensity.

Combustion emissions from an EfW plant are of a similar magnitude to landfilling emissions from the other options, but the additional offsetting of grid electricity is a unique feature to the EfW plant.

4.2.3 Waste Export

The emissions profile for Waste Export is very similar to landfilling in Wellington City, however with increased emissions associated with transporting the waste to its disposal location. It is assumed that the landfills considered as an alternative to the Southern Landfill have equivalent landfill gas collection systems with power generation so there is no material change in landfill emissions.

4.3 Results

Based on the analysis of the emissions sources described for the three options, total annual operational emissions figures are presented below. Please note that these figures are net operational emissions, taking into account grid power generation displaced by the Energy from Waste plant. The gross emissions of the EfW facility prior to this displacement can be seen below in Figure 7; the emissions displaced are likely to reduce over time.

Table 4: Annual Operational Carbon Emissions Summary

Option	Annual Net Operational Emissions (tCO ₂ e/yr)
Landfill Extension	23,000
Energy from Waste (EfW) facility	22,400
Waste Export	23,200



Figure 7: Summary of Gross Operational Emissions (including abated emissions from energy generation) by Source

The dominating source for the options identified (excluding EfW) is the landfill emissions associated with landfilling the biodegradable portion of waste received at the Southern Landfill. While there may be variations in emissions associated with power consumption and travel distances between waste sources and final locations across these options, these changes are insignificant in comparison to the contribution of emissions associated with landfill gas on the overall operational carbon balance.

While Energy from Waste's total emissions are the lowest they are within 10% of the other options when taking into account emissions offsets from energy generated at the facility.

Due to the differing levels of accuracy present in each individual emissions factor and the different dominant sources of emissions between the selected options, it is too close to determine a best-fit solution from an operational emissions lens.

What we can say is that between all options that involve biodegradable waste being sent to landfill (Landfilling, Waste Export), the difference in operational emissions is minimal.

4.4 Future Context and Risks/Opportunities

The results above are highly sensitive to the quantities of incoming waste streams, particularly plastic wastes and organic wastes.

The largest emissions source in most options (Landfill, Waste Export) is the decomposition of organic waste is residual waste sent to landfill. The emissions associated with this activity directly correlate to the quantity of organic wastes landfilled. If WCC can implement waste minimisation and diversion programmes to decrease the volume of organic waste in its residual waste collections, this will have a large impact on the total operational emissions profile of the options. Overseas, countries have imposed heavy penalties and/or bans on the landfilling of organic waste, supported by source-segregated collection strategies and waste minimisation programmes. Reduction in residual waste volumes will also decrease transportation emissions. Plastic waste volumes to landfill are a key focus of incoming waste legislation, which clearly earmark plastic products that will no longer be used or produced in New Zealand. As plastic waste is reduced and diverted from residual waste streams over time, this will have a number of effects on the options above. For the EfW

plant, a reduction in plastic volume will reduce the energy content of incoming waste and may make the solution less viable to operate. As above, all options will see a reduction in transportation emissions.

The New Zealand Government has set national targets for reducing greenhouse gas emissions. National reduction initiatives include greening of the electricity grid to 100% renewable by 2035. At this stage there is no formal reduction commitment from the New Zealand Government for natural gas. This will have flow on effects for organisations who are energy intensive as they will see drop in their electricity emissions from the transition to renewables in the grid. The latest information from the Climate Change Commission shows that a 97% renewable grid by 2035 could reduce the carbon intensity of current (2018 MfE emissions factor) grid electricity by ~50%⁵. This could greatly impact the ability of the EfW plant to offset electricity grid emissions and significantly increase its net carbon emissions.

We are also seeing a significant shift to electric vehicles with the market changing rapidly to support the achievement of New Zealand's national targets. It is likely that the availability of electric waste trucks in future could assist with the decarbonisation of WCC's transportation emissions. However, this is dependent on the affordability of new technology as it becomes available. This will impact the operational emissions for all options, particularly waste export.

5 Avoided Carbon Opportunities

As the world moves to positioning sustainability at the forefront of decision-making, it is important to acknowledge the shift we are seeing to better recycling of materials to displace the manufacturing of virgin materials. This has a greater influence than that of solely carbon savings but from a circular economy framework as well. Investment in recyclable waste diversion facilities will future proof the region with respect to anticipated growth in the recycled materials market. This will not impact WCC's operational emissions but will influence the emissions on a regional/ global scale through their supply chain.

There is an opportunity for emissions to be avoided outside of WCC's operations by the avoidance of extracting raw materials, and this should be considered when assessing the benefits of a waste recovery system. Avoided emissions have been classified as the difference between manufacturing a product using virgin materials versus using recycled materials.

5.1 Avoided Materials by Option

5.1.1 EFW

The EfW has the potential to only repurpose bottom ash. This material can be used to offset concrete in construction applications up to a certain percentage of total concrete.

5.1.2 Landfilling Options

Landfilling materials does not provide a similar opportunity to avoid emissions by recycling materials.

⁵ Climate Change Commission (2021) Ināia tonu nei: a low emissions future for Aotearoa (modelling and data section); <https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/inaia-tonu-nei-a-low-emissions-future-for-aotearoa/>

5.2 Methodology

Emission factors for the embodied emissions/primary manufacturing of materials and recycling materials have been sourced from the UK Government GHG Conversion Factors^[6] and the Infrastructure Sustainability Council^[7] factors. Approximate annual tonnes of avoidable material for each option has been provided by the “Future Waste Management Options” report. These tonnes have then been applied to emissions factors to estimate the possible carbon savings from diverting this waste from landfill.

The difference between the primary manufacturing of materials and recycling materials has been estimated to indicate possible savings if these materials are diverted from landfill. Primary manufacturing emissions include extraction, primary processing, manufacturing and transportation of materials to point of sale. For recycled materials these emissions include the sorting, processing, manufacturing and transportation of materials to point of sale. The transportation of materials from the waste recovery facility to an overseas or local recycling facility has been excluded from this assessment as the location of the recycling facility could be either in NZ or overseas and so could vary widely.

An indication of whether each of these materials savings are significant in relation to the average operational footprint of all potential waste management facilities has been generated to quantify the significance of each avoidance opportunity. Significance has been classified as insignificant (<5%), minor significance (<10%) and significant (>10%) in comparison to WCC’s facility operational footprint.

5.3 Assumptions/ limitations

It has been assumed that 70% of the identified output material streams from each of the recovery facilities is exported to a recycling facility.

For bottom ash, it has been identified that there may be a practical application that may have positive market conditions that bottom ash to be turned into supplementary cementing material (SCM) in New Zealand. This is the process of using bottom ash to displace some virgin cement and aggregate content when manufacturing concrete⁸.

5.4 Results

This table represents the upper bound of emissions that could potentially be avoided if a market can be found for these materials. The emissions avoided will decrease if the recyclates are used to replace lower value materials – i.e. if bottom ash was used as aggregate instead of an additive for concrete. The emissions avoidance could be zero if no market is found and they are sent to landfill.

Table 4. Estimated maximum potential emissions avoided from diverting recyclable materials from landfill per year.

Waste technology options	Avoided material (tonnes/year)	Maximum possible annual savings (tCO ₂ e/year)	Carbon significance	Ease of Recycling
Energy from Waste (EfW)	Aggregate Bottom ash (~15,200)	~2,500	Significant	Moderate, onshore
Total		~2,500	Significant	

⁶ Greenhouse Gas reporting: conversion factors 2021; <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021>

⁷ Infrastructure Sustainability Materials Calculator; <https://www.iscouncil.org/>

⁸ Application of Fly Ash and Slag Generation by Incineration of Municipal Solid Waste in Concrete <https://www.hindawi.com/journals/amse/2020/7802103/>

5.5 External Factors

As mentioned in the above section changes in waste composition and any push to move to circular waste management upstream of residual waste collection will likely reduce the emissions avoidance associated with these options as these emissions will be avoided elsewhere.

6 Whole-of-Life Carbon Commentary

The whole-of-life carbon footprint of each waste management option is the combined results from the embodied, operational and possible avoided emissions assessment.

It can be seen that the embodied emissions for each of the options does not appear to be material to the overall footprint. The results of the embodied emissions are dwarfed by the annual operational emissions of each facility. Between facilities the operational emissions do not appear to vary significantly.

The avoided emissions potential for EfW via additional material recycling has been included as an additional category that could affect the ongoing operational emissions associated with these options. These avoided emissions opportunities will not impact WCC facility's operational or embodied emissions, but are something to consider in the decision-making process. It should be emphasised that this is a high-level indication of possible savings only, due to the various factors involved in a material being recyclable.

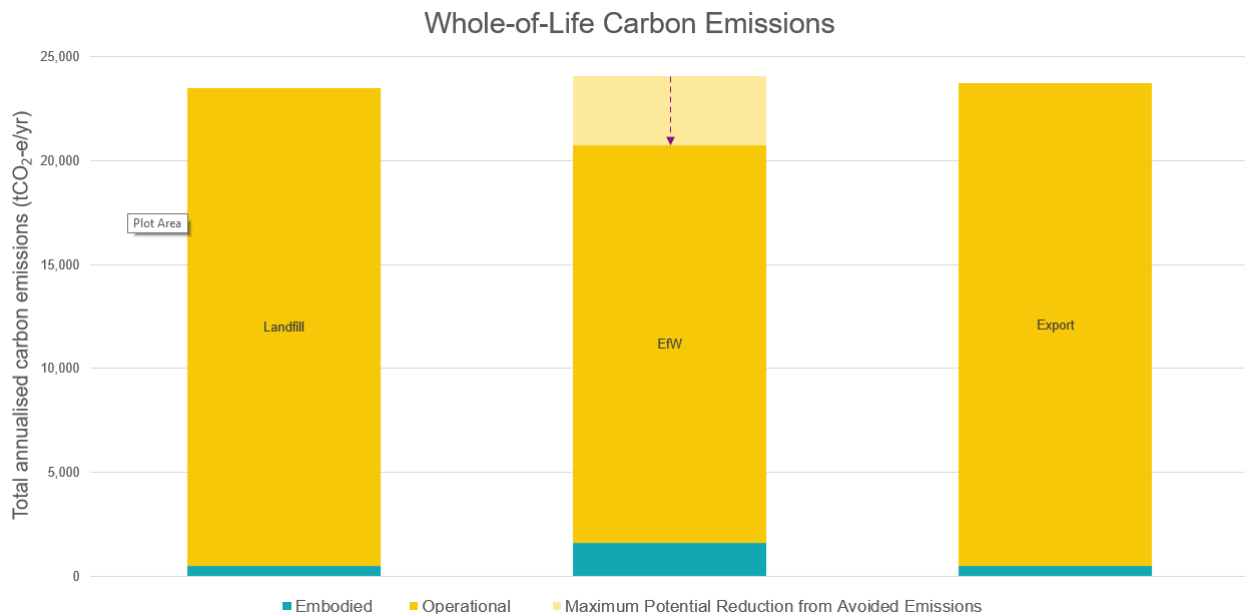


Figure 8: Whole-of-life carbon profile per waste management option

It should be noted that these Whole of Life figures are based on three separate contributing sources of carbon emissions (embodied, operational and avoided emissions potential) which have all been quantified with different levels of accuracy. Additionally, because of the assumptions made when developing the scope of these assessment, these emissions summaries are comparative only and should not be used when comparing these options to other emissions abatement opportunities outside the scope of this assessment.

7 Conclusions

Following the review of all waste management options it appears that the embodied and operational emissions for each option do not differ significantly. Given the underlying uncertainty associated with each aspect of the emissions quantification a conclusion of which option has the lowest carbon profile is not able to be made.

When including the possible avoidance of upstream emissions from extracting virgin materials, could have impacts within the wider supply chain of WCC. This is a key area of opportunity if a technical residual waste management solution was to be developed by WCC. However, these opportunities are difficult to accurately quantify given uncertainties around the presence of required material offtake markets and the suitability of these materials for processing domestically.

The best way to reduce waste emissions is to implement strategies to lower the amount of biodegradable waste (i.e. food waste, garden waste, paper waste, timber etc.) from being disposed of in landfill. While this has not been a focus of this study, opportunities and initiatives to accomplish this goal are being separately investigated by WCC.

As per the basis and recommendations of our previous “Future Waste Management Options” report, upstream waste reduction initiatives need to be carefully considered when planning future residual waste handling developments and investments. While some of the options are technically and economically feasible based on current waste reception volumes, reductions in key waste categories like organics and plastics may have adverse effects on the viability of the selected option.

8 Limitations

This report has been prepared by Beca Ltd (Beca) under Contract for Services: Wellington City Council – Future waste Management Options 2020 dated 15/02/2021 (Agreement) between Beca and Wellington City Council (Client). Beca has been requested by the Client to provide a Carbon Impact Assessment (proposal dated 15/09/21) relating to the Project.

The contents of the report are confidential and may not be used by the Client for any purpose other than in accordance with the stated Scope. This report may not be used or relied upon by any other party and Beca accepts no liability to any person other than to the Client for issues arising out of this report.

By relying on this report, the Client confirms that:

- (a) Beca’s duty of care is owed solely to the Client and no other person;
- (b) Beca’s liability to the Client in relation to this report shall be subject to the same limitation of liability provided in the Agreement. To the maximum extent permitted by law, the maximum aggregate of all liability of Beca to the Client whether in contract, tort or otherwise, shall not exceed the amount of the limit provided in the Agreement;

In preparing this report Beca has relied on key information provided by the Client and information readily available in the public domain.

Unless specifically stated otherwise in this report, Beca has relied on the accuracy, completeness, currency and sufficiency of all information provided to it by, or on behalf of, any third party, including the information listed above, and has not independently verified the information provided. Beca accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the information provided. Publicly available records are often inaccurate or incomplete.

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E

Appendix E – Energy From Waste Discharge Limits

Pollutant	IED Daily average limit (mg/Nm ³)	IED Half-hourly average limit (mg/Nm ³)	IED 10-minute average limit (mg/Nm ³)	BREF Daily average limit (mg/Nm ³)
Total dust	10	30	N/A	5
Total organic carbon (TOC)	10	20	N/A	10
Hydrogen chloride (HCl)	10	60	N/A	6
Hydrogen fluoride (HF)	1	4	N/A	1
Sulphur dioxide (SO ₂)	50	200	N/A	30
Nitrogen monoxide (NO) and nitrogen dioxide (NO ₂)	200	400	N/A	120
Carbon monoxide (CO)	50	100	150	50
Ammonia (NH ₃)	N/A	N/A	N/A	10

Table 15: Energy from Waste Heavy Metals Discharge Limits

Heavy metal	IED Total Limit (mg/Nm ³)	BREF Total Limit (mg/Nm ³)
Cadmium (Cd)	0.05	0.02
Thallium (Tl)	0.05	0.02
Mercury (Hg)	0.05	0.02
Antimony (Sb)	0.5	0.3
Arsenic (As)	0.5	0.3
Lead (Pb)	0.5	0.3
Chromium (Cr)	0.5	0.3
Cobalt (Co)	0.5	0.3
Copper (Cu)	0.5	0.3
Manganese (Mn)	0.5	0.3
Nickel (Ni)	0.5	0.3
Vanadium (V)	0.5	0.3
Polychlorinated dibenzo-dioxins and furans (PCDD/F)	0.1 (ng I-TEW/Nm ³)	0.04 (ng I-TEW/Nm ³)
PCDD/F and dioxin-like polychlorinated bi-phenyls (PCBs)	N/A	0.06 (ng WHO-TEQ/Nm ³)

F

Appendix F – Waste Technologies Assessment Matrix

OVERARCHING AIM: Meet Wellington City's current and future needs for residual waste underpinned by a Maori World View**Scenario: No weighting**

1 = much worse than others
 3 = slightly worse
 5 = neutral
 7 = slightly better
 10 = much better

List ref.	Criteria	Description	Stage IV Landfill Expansion	Piggyback Expansion	Energy from Waste	Export (No collection)	Discussion
1	<i>GHG Emissions</i>	Te Atakura First to Zero is WCC's blueprint for reducing greenhouse gas emissions produced in Wellington City to zero by 2050. As such, WCC's Final Waste Option should align with this ambition.	3	5	7	3	
		Comment	As described for Piggyback landfill expansion, with addition of risk of removal of natural carbon sink to allow for expansion into forested area.	GHG emissions from landfill include methane and CO2 released via the anaerobic decomposition of organic wastes. Modern landfills are fitted with gas capture systems to mitigate this. More info is contained in Beca' separate report on GHG emissions from shortlisted options.	GHG emissions from EfW facilities include CO2 generation from combustion of anthropogenic materials such as plastics and textiles. More info is contained in Beca' separate report on GHG emissions from shortlisted options.	As described for Piggyback landfill expansion, with addition of increased transport emissions.	The key differences between the options are described in the previous report on carbon emissions impacts of the previously shortlisted options. The rankings are based on a cross-assessment of embodied, operational and avoided emissions potential.
2	<i>Circular Economy</i>	The Final Waste Option should support a transition to a circular economy that reflects natural systems and puts the wellbeing of Papatūānuku first.	5	5	3	5	
		Comment	Non-circular waste management strategy; does not provide a barrier to upstream waste minimisation or upstream residual waste processing/diversion	As described for Stage IV landfill expansion.	Non-circular waste management strategy; possible ash products are not fully circular and are an example of "down-grading" economies. Upstream waste diversion has potential impacts on operational success of EfW plant.	As described for Stage IV landfill expansion.	
3	<i>Community Connection</i>	The final waste disposal option enables and supports community connection and understanding of residual waste management, and is not a barrier to waste minimisation initiatives	7	7	5	1	
		Comment	Not a barrier for waste minimisation.	As described for Stage IV landfill expansion.	EfW plant requires certain amount of waste to operate effectively.	Exporting waste disconnects community from residual waste management	Locating the waste option in Wellington is the most important aspect when considering community connection; the complex operational nature of EfW plants is a barrier to community connection.
4	<i>Scalability</i>	The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received.	10	10	3	10	
		Comment	Landfilling can manage changes to waste generation over time and changing waste content.	Landfilling can manage changes to waste generation over time and changing waste content.	EfW is designed for a specific tonnage and composition and so would be more challenging to scale. However you could build additional lines or bring in commercial tonnages if waste volumes decreased	Landfilling can manage changes to waste generation over time and changing waste content.	

5	Technical Maturity	Implementing a Final Waste Option that is already established will reduce the technical risks involved. Where a technology has had 10 or more successful uses it is likely to be well understood with suitable parts, operators and expertise. Any option that has been implemented in less than ten sites globally or is still in the research phase indicates that this process is novel and so presents a higher risk for Wellington City Council.	10	10	7	10	
Comment			Well established residual waste disposal technology internationally and domestically	Well established residual waste disposal technology internationally and domestically	Well-established technology with hundreds of reference sites globally; sizing for Wellington City residual waste volumes pushing close to limit of technical feasibility	Well established residual waste disposal technology internationally and domestically	
6	Time Frame	The consent for the Southern Landfill expires in June 2026 and as such the Final Waste Option will need to be constructed and operational before this date.	7	10	3	10	
Comment			Some risk that consenting and construction timeframes will not allow timely operation of Stage IV development.	Required construction activities able to be delivered before this time.	A typical construction programme from NTP to take over is in the order of 3 years, so would be very close (not including additional consenting timeframe).	No required construction so no challenges to implementation other than operational arrangements.	No issues foreseen with Piggyback and Waste Export; minor risk to timeline with consenting of Stage IV landfill and major risks to implementation timeline of EfW.
7	Local Community Effects	The Final Waste Option should minimise effects on the local community, including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area.	3	5	7	10	
Comment			Landfill can have some odour and traffic is expected to be similar to current levels. Note that the Stage IV landfill will move the landfill closer to the site boundary so odour affects may increase.	Landfill can have some odour and traffic is expected to be similar to current levels	EfW has minimal odour and traffic is expected to be similar to current levels	There will be no local impacts as all waste will be exported	Of the options likely to be installed on existing site, EfW is least impactful (due to incineration of waste and destruction of odours) and Stage IV development is most impactful (closer to boundary).
8	Environmental Effects (water)	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse effects to waterways and surrounding aquatic environments i.e. emissions to watercourses.	3	3	7	5	
Comment			Stage IV remediation of stream would improve current risk of aquatic emissions at Southern landfill site, but would involve destruction of current stream and require construction of artificial watercourse.	Piggyback option would not remove current risk of contamination of tunnelled stream.	EfW facility would result in minimal emissions to watercourses.	Assessed similar to Stage IV Landfill assessment - not confirmed which landfill/s the residual waste will go to.	Both landfill expansion options have risks above general water risks for landfills - retained covered stream vs. required construction of artificial watercourse.
9	Environmental Effects (land)	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions and contamination to surrounding land.	3	3	7	3	
Comment			Landfilling will inevitably result in emissions to land.	As described for Stage IV landfill expansion.	EfW facility would result in minimal emissions to surrounding land.	As described for Stage IV landfill expansion.	
10	Environmental Effects (air)	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions to air (including from transport) e.g. particulate or VOC emissions.	5	7	3	5	
Comment			Risk the development of land near border with Zealandia would result in increased offsite particulate and wind-carried emissions to surrounding environment.	Minimal emissions to air.	Emissions to air post treatment (particulates etc.) from combustion of waste materials	Assessed similar to piggyback option assessment, with inclusion of additional emissions from transportation.	Waste export and Stage IV both assessed worse than piggyback option (landfill base score) due to additional transport emissions with export option and risk of wind carried emissions to neighbouring sites with Stage IV expansion.

11	<i>Consent and Planning</i>	The Final Waste Option should have a strong likelihood of approval given existing policies, and alignment with central policy direction.	5	7	3	10	
		Comment	Some possible consenting issues posed by impact on surrounding Zealandia site and required development of forested land.	No barriers to consenting.	Would be first of its kind consented in New Zealand.	No consenting required.	Different consenting challenges for three local options; no consenting required for waste export.
12	<i>Value for money</i>	The Final Waste Option should provide overall value for money for Wellington City ratepayers and ensures any financial investments takes into account intergenerational costs considerations	7	10	5	1	
		Comment	Low operational cost to operate, inclusive of post-operational monitoring and land rehabilitation. Estimated gate fee including capex and opex and ETS - \$70-100/tonne	Lowest cost to construct and similar operational cost to Stage IV development, inclusive of post-operational monitoring and land rehabilitation.	High initial costs to construct, higher operational costs to operate than landfill.	Large expected increase in operational costs. Estimated gate fee \$210/tonne+. Loss of control over cost and no gate fee revenue for WCC.	
13	<i>Robustness/ Reliability</i>	The Final Waste Option should be robust and reliable enough to handle changes in incoming waste content, and any equipment should be available and online for as close to 100% of its required operational hours as possible.	10	10	7	7	
		Comment	Robust, reliable and flexible in terms of waste quality	As described for Stage IV landfill expansion.	Robust, reliable and some flexibility in terms of waste quality to a limit.	Doesn't provide a local service but reliable.	For EfW, changes in incoming waste content can affect performance of plant. For Export option, while landfilling is a mature and reliable technology WCC will have little to no control or influence over operations of landfill so adjusted score to reflect this.
14	<i>Size</i>	The Final Waste Option should be able to fit within the existing site, or be able to integrate into existing waste network.	10	10	10	10	
		Comment	Would fit in existing site	As described for Stage IV landfill expansion.	As described for Stage IV landfill expansion.	Solution based outside of Wellington City so no space constraints.	
15	<i>Resilience</i>	The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations (e.g. earthquakes or other natural disasters). This will consider day-to-day waste transport corridors including whether the solution is based locally or outside the Wellington region	10	10	7	1	
		Comment	Local-based solution, able to cope with short-term increases.	As described for Stage IV landfill expansion.	As described for Stage IV landfill expansion, with some challenges for handling large C&D waste volumes in event of earthquake.	Solution based outside of Wellington City; transport corridors at risk in case of disasters.	
16	<i>Te Ao Māori</i>	The Final Waste Option should uphold Te Ao Māori and uphold the commitments of Te Tiriti o Waitangi, to ensure the protection of tapu, the wellbeing and restoration of Papatūānuku, and provide options which are suitable for the physical and cultural environment of Aotearoa. As part of this, a strong partnership with Mana Whenua must be embedded within the foundation of the option.	5	7	3	1	

Comment	The required destruction of forest area to implement this solution is not aligned with the principles of restoring Papatūānuku, but this could be mitigated through wider environmental remediation works. Consenting timeline pressure should not be a barrier to Mana Whenua engagement and partnership, but this will be important to reinforce as early as possible.	The piggyback landfill expansion minimises adverse effects to tapu, although it will still pose risks to surrounding land and waterways. Its reduced lifespan sets an expectation for WCC to develop and implement better waste management systems in the near future. Appropriate consenting timeframe will support stronger partnership with Mana Whenua.	Energy from Waste does not closely align with principles of protecting tapu and supporting regenerative systems, so would not be a close cultural fit for implementation. Rushed implementation timeline would likely become a barrier to effective engagement and partnership with Mana Whenua.	Waste exporting is not deemed to be compatible with WCC honouring its commitment to Te Tiriti, to protect and restore the environment; exporting Wellington City's waste is shifting the responsibility to other councils to manage the waste generated by WCC and disconnects waste generation physically and culturally from waste management.	
Score (Out of 160)	103	119	87	92	
Score (%)	64%	74%	54%	58%	
Ranking	2	1	4	3	

Criteria Feedback &
Option Scores

Respondent	Original Wording	David Howie	Te Kawa Robb	Mike Downer (completed form twice, results collated)	Geordie Gartell	Ali Forrest
Source		Feedback form	Feedback form	Feedback form	Feedback form	Feedback form
GHG Emissions statement wording	Te Atakura First to Zero is WCC's blueprint for reducing greenhouse gas emissions produced in Wellington City to zero by 2050. As such, WCC's Final Waste Option should support this and align with this ambition.	Agree - so long as it is not interpreted as an ability to export emissions or CO2 liability.	No change.	Agree - no change	Yes	Te Atakura First to Zero is a bit out of date (2019) on waste – it doesn't include the Moa Point sewage sludge solution, nor any plans for removing organic matter from the landfills via collection etc.
GHG Emission Score		Critical	Critical	Very Important	Critical	
Circular economy statement wording	The Final Waste Option should support and enable a transition to a circular economy.	To be of value "Circular Economy" needs to be defined as to context within this statement. I am not comfortable with the use of "enable" in this statement as waste sits outside a circular process. My suggestion would be "The Final Waste Option should support waste minimisation and a transition to a circular economy."	Change: 'The Final Waste Option should support and enable a transition to a circular economy that reflects natural systems and puts the wellbeing of Papatūānuku first.'	Agree - No change	Yes	Relevant questions to be considered are: What are the end products? How much goes to landfill after processing (if any)? Are there markets (covered in the criterion 'Maturity of offtake market')? How is the final residual waste to be managed and what legacy does this leave to future generations (5,10,15,20yrs +)?
Circular Economy score		Very important	Critical	Very Important/important	Very Important	
Community Connection statement wording	The Final Waste Option enables and supports community connection and understanding of residual waste management, and supports activities that minimise fly tipping and supports community waste minimisation initiatives.	Agree	Change: 'The Final Waste Option enables and supports community connection and understanding of residual waste management, and supports equitable community waste minimisation initiatives.'	Agree- No Changes	Yes	The social considerations of any final waste option needs to be future-proofed as well as grounded in the here and now. Heavier weighting for the Council as a Corporate Citizen of Wellington, facilitating, showing strong leadership and enabling community connection; this is a fundamental, and understanding it is critical to engagement and success. Current leadership and engagement is poor in whenua kaiitiakitanga.
Community Connection score		Very important	Critical	Very Important/important	Very Important	
Scalability statement wording	The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received. The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations.	Agree	Change: 'The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received while upholding the wellbeing of Papatūānuku. The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations.'	Agree- No Changes	Yes	The funding model needs to take into account whether the solution will remain economically viable as waste reduces. The final option must reduce tonnage, have resilience and react nimbly to emergencies and needs to honestly define what an emergency is.
Scalability score		Very important	Very Important	Critical	Critical	

Technical Maturity statement wording	Implementing a Final Waste Option that is already established will reduce the technical risks involved. Where a technology has had 10 or more successful uses it is likely to be well understood with suitable parts, operators and expertise. Any option that has been implemented in less than five sites globally or is still in the research phase indicates that this process is novel and so presents a higher risk for Wellington City Council.	Agree. Need to reference applicable scale material composition to ensure a genuine similar use case for evaluation.	Change: 'Implementing a Final Waste Option that is already established will reduce the technical risks involved. Technical solutions must also ensure it works within te ao Māori, so while technically mature options are preferable, innovation from a Māori world view may open new technologies that best suit the cultural and physical environments here.'	Agree- No Changes	Yes	There are actually 2 aspects to this – international and domestic technological maturity. Even if the technology is mature abroad, NZ has a different environment in many ways and there is no guarantee that - for instance - the legislative framework is suitable or that experts could be shipped in or trained up. Conversely, technology considerations should not exclude innovative options just because they are novel.
Technical Maturity score		Important	Important	Critical	Critical	
Time Frame statement wording	The consent for the Southern Landfill expires in June 2026 and as such the Final Waste Option will need to be constructed and operational before this date (or within 1-2 years if an interim temporary measure is used).	This reads as a pre-judgement. Suggest " The Final Waste Option will need to be consented and operational before this date (or within a confirmed time period after this date if an interim measure is required/used).	Agree	Agree- No Changes	Yes	What is the interim, temporary measure? That sounds a good option. It is not obvious to us that the Waste to Energy can be constructed by 2026, despite the assumption in the Beca report.. There would be many issues to resolve even before building, including getting consents, choosing and acquiring a site, going through a public engagement process, accessing funding, training up local expertise . There has been much sense of urgency around resource consent application time, for a very long time, propelling pre-21st century solutions to waste at the expense of solutions that reflect changing technology and population growth. This is the reason for communities' skepticism that this consent is urgent. There is certainly also urgency around implementing WMMP solutions.
Time Frame Score		Important	Important	Very Important	Very Important	
Local Community Effects statement wording	The Final Waste Option should minimise effects on the local community, including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Agree	Agree- No Changes	Yes	There is also mud, dirt and visual impairment of scenic areas. Impact on public health must also be considered. Any WMMP discussions must include the two private landfills - which actually deal with larger amounts of waste than the Southern Landfill. All landfills (private and public) final waste solutions need to be coordinated because solving the immediate problem of the southern landfill capacity does not address the overall problem of waste minimisation.
Local Community Effect score		Very important	Very important	Very important/important	Critical	
Environmental Effects (Water) statement wording	The Final Waste Option should minimise effects to waterways and surrounding aquatic environments i.e. emissions to watercourses	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Change: 'The Final Waste Option must uphold tikanga and te ao Māori and eliminate any effects to waterways and surrounding aquatic environments i.e. emissions to watercourses.'	Agree- No Changes	Yes	The aquatic flora and fauna will be affected. The groundwater might also be affected. On closure of the landfill there may be residual effects. The final waste option needs to start to show a roadmap of replenishing, reinvigorating, and depolluting both the open and closed waterways (above and below the ground). For too long solutions have sought to remove streams feeding into the Marine Reserve and Strait. This is working against the forces of nature – our suburbs are hilly, and with that comes a network of streams pouring fresh water into the Marine Reserve. Practice over the last century has turned our fresh waterways into 'diverted tunnels', 'drains'. We want to see sewage removed and streams daylighted, but the Stage 4 solution does not daylight the stream until it is closed off, the operative word being 'eventually'.
Environment Effects (water) score		Very important	Critical	Critical	Critical	
Environmental Effects (land) statement wording	The Final Waste Option should minimise emissions or contamination to surrounding land	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Change: 'The Final Waste Option must uphold tikanga and te ao Māori and eliminate emissions or contamination to surrounding land.'	Agree- No Changes	Yes	Also the flora and fauna. How the land can be restored should be considered, and the residual effects of waste on closure. The final waste option needs to start to show a roadmap of replenishing, reinvigorating and reintroducing natural and fragile flora and fauna.
Environmental Effects (land) score		Very important	Critical	Critical	Critical	

Environmental Effects (air) statement wording	The Final Waste Option should minimise emissions to air (including from transport) e.g. particulate or VOC emissions.	Agreed... but is this not a required outcome of the consenting process, and therefore redundant?	Change: 'The Final Waste Option must uphold tikanga and te ao Māori and eliminate emissions to air (including from transport) e.g. particulate or VOC emissions.'	Agree- No Changes	Yes	Any solution at the Southern Landfill which affects air quality is of serious public health concern as it is situated in a built-up area. The Waste to Energy option will emit such toxins as dioxins, apparently at very low levels, but still at levels higher than we currently get. Any new solution including landfill, organic and composting at the Southern Landfill must not emit the sort of odours which periodically escape currently, in contravention of the regulations. The aim of the Final Waste Option must be to achieve as close to zero air emissions as current technological solutions enable.
Environmental Effects (air) score		Very Important	Critical	Critical	Critical	
Consent and Planning statement wording	The Final Waste Option should have a strong likelihood of approval given existing policies. This can be demonstrated by a track record for similar consents in NZ.	Given the criteria that consenting and implementation needs to meet the fixed time period, is "consentability" no a given?	Change: 'The Final Waste Option should have a strong likelihood of approval given existing policies, while also being bold, brave and innovative and seeking to go beyond the constraints of existing policies which come with existing limitations.'	Agree- No Changes	Yes	It should also conform to the government's policy direction. This criterion more or less rules out Waste to Energy which has no track record in NZ and will have significant difficulty getting approval.
Consent and Planning score		Very Important	Critical	Very Important/important	Very Important	
Value for Money statement wording	The Final Waste Option should minimise total cost over project life including capex, opex, and revenues (e.g. electricity, heat, recycled products, etc.), and provide value for money for Wellington City ratepayers.	This allows for a very subjective assessment process. Either needs expanding to provide detail of assessment measures to be used, or needs to be simplified to "The Final Waste Option should provide value for money for Wellington City ratepayers."	Change: 'The Final Waste Option should ensure investment is considered from an intergenerational perspective, and that invests adequately in the restoration of the wellbeing of Papatūānuku and where possible, trying to provide value for money for ratepayers.'	Agree- No Changes	Yes	What the funding options are should be considered. It has been stated that Waste to Energy will require a rates hike. The model needs to look at the funding model for the life of the option rather than the project.
Value for Money score		Important	Slightly Important	Important/very important	Very Important	
Robustness/Reliability statement wording	The Final Waste Option should be robust and reliable enough to handle changes in incoming waste content, and any equipment should be available and online for as close to 100% of its required operational hours as possible.	Agree in general however this is two statements and the second half is more of a truism than a criteria. Suggest "The Final Waste Option should be reliable, and robust enough to handle changes in incoming waste content,"	Agree	Agree- No Changes	Yes	Should be future-proof – what is the risk of future obsolescence?
Robustness/Reliability score		Critical	Very Important	Very Important/critical	Critical	
Maturity of offtake market statement wording	If the Final Waste Option will produce secondary products or material streams, it will need to be considered whether mature or developing markets for this material exist, either domestically or internationally.	Agree	Change: 'If the Final Waste Option produces secondary products or material streams, it will need to be considered whether mature or developing markets for this material exist, either domestically or internationally, and take community based resource recovery solutions into account as a possible market.'	Agree- No Changes	Yes	And there needs to be an economic plan. This is consistent with OBRA's vision of an Innovation Precinct that incubates Recycling business science and retail partnering with education providers The Waste option should allow room at the Southern Landfill for a recycling innovation centre which we expect to be part of WMMP deliberations.
Maturity score		Critical	Very Important	Important/critical	Very Important	
Size statement wording	The Final Waste Option should be able to fit within the existing site.	No. This creates a limiting constraint for no clear benefit.	Change: 'The Final Waste Option should be able to fit within the existing site, while taking a wider network approach to satellite and decentralised solutions/hubs throughout the city into account, and is designed to integrate into those.'	It would be preferred if the Final Waste Option could fit within the existing site.	Yes	The assumption seems to be that the site will be the Southern Landfill. For Waste to Energy this is not the only or best option and other sites would have to be considered. For the Piggyback option, not enough information has been released to tell us if this will fit, because there is vagueness around the relocation of the composting plant.
Size score		Slightly important	Very important	Important	Very Important	
Resilience statement wording	The Final Waste Option needs to be resilient and be available when required. This will consider day-to-day waste transport corridors including whether the solution is based locally or outside the Wellington region	Agree		Agree- No Changes	Yes	In an emergency will it allow Wellington to be self-sufficient? The seismic risk to the infrastructure should be assessed. The Final Waste Option also needs to take into account the densely urbanized corridors and the size/ nature of transport that use the corridors. Much of this could be mitigated with resource consent compliance supporting waste reduction at point of creation (building/ demolition). The Final Waste Option must look at the wider picture, rather than just the Southern Landfill, and be coordinated across all three landfills, and any that may emerge in the future.
Resilience score		Important	Critical	Critical	Critical	

Criteria relating to Te Ao Māori overarching view/ Cultural Suitability	Criteria relating to Te Ao Māori overarching view TBC with Iwi	This is a core criteria that needs to be set in conjunction with local iwi. Alignment with Te Ao Maori and Treaty principles is critical.	The overarching criteria must inform all subsequent systems and proposals, to uphold the commitments in Te Tiriti, and ensure long term resilience and wellbeing of taiao and whakapapa for mana whenua.			The Final Waste Option must strongly reflect the changed palette of the community towards Te Tiriti o te Waitangi, Te Ao Māori and solutions which are culturally and socially sustainable, not just business focused.
Criteria relating to Te Ao Māori overarching view score		Critical	Critical	Important/slightly important	Critical	
Additional criteria			Q18 should have been at the top.			
Additional criteria score			Critical			
Landfill Extension - Stage 4	This option was consulted on in 2019 – where the landfill would continue north of the current stage of landfill into undeveloped land. The new landfill would require extensive earthworks as well as the extension of the current stream diversion tunnel further up the valley that runs under the existing landfill. This concept allowed for the eventual daylighting of the stream via a man-made stream running the perimeter of the landfill. This man made stream would eventually join up with Careys stream upon closure. This eliminates the reliance of the stream diversion tunnel that runs under the existing stages of the landfill to continuously divert water - thus, removing any future risk of a tunnel failure that could result in creating an artificial lake buttressed against a landfill. This would have severe environmental consequences to the lower reaches of the stream. The landfill would have a high cost with approximately 25-30 year asset life based on current waste volumes.	Further assessment of impacts required based on reducing annual volume over time	Do not support	This makes sense to me, to provide some resilience and time for future options with developing technologies. Technologies and methodologies are evolving relatively quickly. Sinking vast amounts of money into a long-term Landfill may not be the best use of money.	Zealandia has huge concerns about this extension closer to our perimeter. There is a high likelihood of an increase in wind blown pollution entering the sanctuary. There is a high risk of an increase in mammalian predator numbers because of an increase in food for them. With higher numbers comes an increased risk of a breach into the sanctuary. Wind blown waste and odour also becomes more likely.	The perspective described in the Landfill Extension -Stage 4 was rejected by the OB community in 2019 for these reasons: - it destroys a large area of ecologically valuable land and will remain for a long time, disincentivising waste reduction. - a further length of the stream will be disrupted; although a positive is stated to be the eventual daylighting of the stream, 'eventual' is the operative word - this would only happen after the area is full, i.e.. indefinite . - pests attracted to the waste would be much nearer Zealandia and the far end of Brooklyn. Birds spreading down the corridor towards the south coast would be impacted. These objections still stand. The argument brought up at the working group meeting that it would be easier for council to go for this longer lasting consent rather than fill up the stage 2 first and then have to apply in 15 years or so for stage 4 does not persuade us. We expect there to be minimal waste by that time and that it will be possible, if necessary, to close the landfill.
Landfill Piggyback option	This option was considered as part of the 2019 consultation process but was not consulted on. A new landfill would effectively be built over a closed stage of the existing landfill (Stage 2). The area is currently being used as a storage area for the council as well as for the current council green waste composting operations. This option does not require removal of vegetation from undeveloped land and reclamation of the stream further north of the current stage 3 area. However, it does not remove continued reliance on the current stream diversion tunnel or mitigate the consequences of a tunnel collapse and the resulting accidental lake forming north of the existing stage 3 landfill. This landfill option would have a lower capital cost and a smaller asset life of approximately 12 – 15 years based on current waste volume generation.	Further assessment of impacts required based on reducing annual volume over time	Strongly support	This would be a preferred option in my eyes as opposed to a long-term landfill extension. Doesn't provide the resilience of the Landfill Extension option nor the elimination of the stream/tunnel risk.	Where would the composting operation move to?	For all 3 landfilling options we would like to make the point that: Landfills must not have a prominent role in a modern society. A circular economy means dumping in the Southern Landfill should be drastically reduced to a minimum. Any landfill extension must take this requirement, as evinced in the WMMP, the regional WMMP and the government waste strategy – into account. The funding model needs to be changed to disincentivise burying waste. Where would the composting facility be situated? The stream should not be treated as a nuisance; we should be preserving a rare tohonga and asset to the Wellington community. It reflects an attitude that is increasingly becoming outdated - that business should trump nature. We would prefer an interim extension while the WMMP process decides on volumes and types of waste requiring landfilling. We think 5 years would allow WMMP upstream solutions to reduce amount of land required, thus mitigating concerns around a life 12-15 years. If an extension RC application for this goes ahead we would want to be involved in the application. We would require binding undertakings attached to any RC application, to be discussed in the process subsequent to this decision. We would want this linked to the Greater WMMP Full Transparency – see the data, the plans for the footprint, relocation of the composting, etc.

<p>Energy from waste</p>	<p>There are three types of waste combustion technology in wide-scale operation: grate fired systems; rotary kilns; and fluidised bed combustors. The waste is deposited into a bunker where it is mixed by a crane. The crane then drops the waste onto a feeding chute which feeds the grate located in the lower part of the furnace, where the waste is combusted. The hot flue gas is then passed through the boiler, raising the steam which drives the turbine to produce electricity. The flue gas is then passed through a flue gas treatment (FGT) system which removes pollutants from the gas before it is released to the atmosphere. Ash streams are collected from the furnace, boiler and the FGT and stored before being removed from site.</p>	<p>Energy from Waste is a poor solution for mixed solid waste disposal and has been recently rejected by The EU as a sustainable waste solution. This could be considered at an up stream level for specific waste stream materials but is not a residual waste solution.</p>	<p>Strongly do not support</p>	<p>Like it, allows for future volumes on a narrow footprint of land. Clean solution - and scalable.</p>	<p>What percentage of waste is actually burned in these systems/</p>	<p>We are surprised that this is still on the table. It was shortlisted in the Beca report based on questionable criteria, weightings and interpretation of those. Not least is the fact that the Beca report was written on the assumption that sewage sludge was coming from Moa point. This completely alters the basis of the analysis - as all have agreed. When it became apparent that the sludge was stopping after 2026 the MCA analysis was not re-done on the 14 but a section 10 on sensitivity was added to show how the volumes would change. Waste to Energy has been included in the new list of 4 options now on the table because, as stated at the Waste working group, 14 Dec, it will give a more circular solution than other, now rejected, technology options; it outputs electricity, and an ash that might be usable e.g. in roading, but a final volume of waste is still output, reduced by 75%. However, Eleanor Grant (Infrastructure Committee Oct 14th at roughly 3:29:00) has stated that there are challenges with trying to fit it into a circular economy. This is in effect a waste-run power station, less efficient than a normal one, but outputting electricity and ash. NZ already has a good supply of renewable electricity, and there would have to be a market found for the ash. Council officers have previously stated to us at the CLG that the Waste to Energy plant to be viable would need continued sewage sludge. Eleanor - at the above Infrastructure Committee - confirmed that it would not be economically viable unless it took in 100k to 150k tonnes of waste per annum. The Southern Landfill currently has around 100k tonnes pa and would be getting substantially less on day 1 when the sewage sludge ceases, and then progressively when the organics etc. are reduced. It would need substantial amounts of commercial waste from the private landfills T&T and C&D. The assumption seems to be that it would be sited at the Southern Landfill; however, the above para indicates the need for a regional solution. That would require a whole new perspective. Other reasons for it to be regional are: - Siting it - physically it has a large footprint. - It is the most Expensive option, even before we consider that we would still need to have a landfill extension - although probably less - so it isn't an alternative; you have to fund it as an extra as well as one of the 3 other options. Officers have stated that this will require a rates hike. - Public opinion would be difficult to sway. This plant would not be acceptable to the community of OB and Happy Valley. Consent would be very difficult. Other considerations are: 1. It is not scalable - as waste decreases it would become less and less economic. 2. Environmental - There would be emissions of e.g. dioxins; although apparently very low they would be more than we currently have, and accidents happen. 3. Ash Residue would need a market or else probably stabilising before landfilling. There is also the toxic hazardous ash from the emissions treatment. 4. EU and Nordic countries are moving away from these plants towards upstream solutions. 5. If it did come out from this exercise as the preferred option then it is far from being a done-and-dusted solution - there are a huge number of problems such as where to site it, funding, scalability, consents, data gathering. Which makes it unlikely that it could be delivered for the 2026 deadline. 6. It would definitely have to fit into general WMMP discussions later in the year.</p>
<p>Landfill closure</p>	<p>This option involves closing the landfill and exporting all of WCC waste to a landfill within the Wellington region.</p>	<p>Could include options outside the Wellington area</p>	<p>Support as longer term goal - 20 years, following piggyback option and rapid reduction of landfill waste</p>	<p>WCC loses control over the waste. It would raise costs on disposal and transportation/collection due to distance. Would not be my preferred option as it limits control the city has on its waste. Places the city at the mercy of other controlling parties.</p>	<p>Not really a viable option.</p>	<p>We do not see this as a satisfactory solution as it just shifts the problem elsewhere. We would like to see the Landfill as rapidly as possible phased out as part of the WMMP. After 15 - 20 years we envisage the minimisation of waste and the closing of the Southern landfill.</p>
<p>Additional Comments</p>			<p>Be brave, be bold, be innovative! We only have one planet, we (tangata whenua) have thousand year tested solutions so ensure you engage with us to navigate and co-steer, and think about the legacy you will leave behind for you grandchildren with the options and solutions landed on.</p>			<p>We fully agree with the Beca Report's penultimate sentence: "It may be that WCC is better to invest in upstream activities to reduce waste to landfill."</p>

Waste Free Welly / Para Kore	Carl Savage	Written feedback received as part of 2nd workshop	Summary of Feedback	Amendments to Criteria	Rationale for Amendments	Revised Criteria Wording
Feedback form	Feedback form	Written feedback				
Emissions reduction is an important criteria and it makes sense to align with Te Atakura First to Zero. However, the vague wording risks giving a reductive answer. For example, the benefits of producing 'renewable energy' from burning organics in a Waste-to-Energy facility would look like a positive outcome for GHG emissions if it only considers emissions from the facility itself. This criterion should specify some of the broader emissions impacts, including considering waste-related GHG emissions other than biogenic methane from organic waste decomposing in landfill (i.e. including a consumption-based emissions accounting approach), and the GHG emissions at various stages and processes of the waste management system. As standalone options, none will result in a decrease in waste emissions across material/product lifecycles as they are predicated on continued waste generation. Waste tonnages processed should be consistent across all options - and different waste minimisation scenarios carried out for sensitivity analysis. A consumption-based emissions accounting framework could be added to this sensitivity analysis to see which option best responds to upstream waste and emissions reductions. The criteria also needs to be more specific in terms of boundaries: must be GHG emissions irrespective of where they are generated to avoid options outside of the boundary of WCC (e.g. exporting waste to another landfill) being seen as preferential. The GHG emissions associated with the construction of the infrastructure and the materials used should also be part of the assessment. Finally, the criteria needs to consider how the options will support adaptation to climate change impacts. Some of these points may already be part of Te Atakura, but we recommend adding some of these details to the criteria to reflect the range of emissions and climate change implications of the residual waste options.	AMMENDMENT - reducing gas emissions produced in Wellington City to AS CLOSE TO ZERO AS POSSIBLE by 2050 As such, WCC's Final Waste Option should support this and align with this ambition.	* Te Atakura is good but only a first step, has limitations, Te Atakura only focuses on prod based emissions so landfill emissions methane (4%) are visible but consumption emissions in association with material flow analysis are the future 45%+ of footprint *Criteria needs to reflect support for net carbon reduction at NZ and global level *I support this *Best way to reduce emissions is to keep organics out of our landfill *I support this	Mostly agree Suggested changes: additional details should be added to reflect the range of emission, broader emissions impacts and climate change implications of residual waste options, reduction of emissions to "as close as zero by 2050" Comments: avoid interpretation of the ability to export emission/CO2 liability, Te Atakura may be out of date and has limitations, need to reflect support for net carbon reduction (NZ & world level)	Replacement of "support" with "align"	Agree with community stakeholder suggestions that that the largest opportunities for GHG emission reduction are in upstream waste minimisation and diversion practices, particularly concerning organic waste. The final residual waste disposal option should not be an obstacle to the implementation of effective waste minimisation. Reflects stakeholder working group support for residual waste management strategy to be connected to overall strategy to reduce waste.	Te Atakura First to Zero is WCC's blueprint for reducing greenhouse gas emissions produced in Wellington City to zero by 2050. As such, WCC's Final Waste Option should align with this ambition.
Critical			Critical			
This criteria needs a clearer definition. No disposal option supports and enables a circular economy in and of itself. The links to circular economy in terms of waste disposal are: Whether it locks the Council into continuing to generate and dispose of significant amounts of waste into the future. Whether the location and footprint of the facility impacts on the ability for the Council to put in place other infrastructure that will support the circular economy, e.g. a resource recovery park. The other way to look at it would be to consider the impacts of the construction of the infrastructure itself - earth moving, construction materials etc., and whether these align with circular economy principles. We also suggest adding wording that frames the circular economy as a system that reflects natural systems and puts the wellbeing of Papatūānuku first.	AMMENDMENT - The Final Waste Option should support and enable a transition to a circular economy, AS MUCH AS PRACTICABLE	*Circular economy is vital. The options do not support it except to provide a transition. Waste to energy might even disincentivise it *Is not in line with Māori world view and through destruction of Taonga and resources breaches Te Tiriti *Circular economy is the context, none of the options support circular economy *thing to avoid is lock in	Somewhat agree Suggested changes: define "Circular Economy" in context - waste minimisation, use of "enable" may be unsuitable, statement should include that it reflects on the natural systems and wellbeing of the Papatūānuku.	Replacement of "enable" with "support", include additional statement "that reflects natural systems and puts the wellbeing of Papatūānuku first".	The waste option will provide support for a transition to a circular economy, to "enable" is beyond the scope of this assessment. We agree it is important to define circular systems as reflective of natural systems i.e. fully circular instead of "down-cycling" systems, and take into account material as well as energy inputs.	The Final Waste Option should support a transition to a circular economy that reflects natural systems and puts the wellbeing of Papatūānuku first.
Critical			Very Important			
We support these points being actioned, however, we don't feel they fit well within the MCA process. These factors will require commitment outside of the residual waste options decision - whichever option is chosen, additional actions are required to generate these outputs/outcomes. It is critical that these matters are considered but better fit with alignment on strategic direction and conditions of resource consent sections. This criteria currently includes 3 different matters: community understanding, fly tipping and "community" waste minimisation initiatives. It is not clear to us why 'community' waste minimisation is separate to business, council or government waste minimisation initiatives. We do not feel that fly tipping is particularly relevant to choosing a final waste disposal option. One important but missing connection between these matters is around equity, ensuring that waste minimisation initiatives are affordable and accessible, and that barriers to engagement in waste minimisation are removed.	AMMENDMENT - The Final Waste Option NEEDS WIDE COMMUNITY PUBLICITY, EDUCATION AND PROMOTION TO enable and support community DIALOGUE, connection and understanding of residual waste management, and supports activities that minimise fly tipping and supports community waste minimisation initiatives.	*Faculty should pay benefits to local community Brooklyn & Owairo *The final waste options enables and supports community connection and understanding of residual waste management, and supports equitable community waste minimisation *Requirement of any solutions - needs to be part of the consultation process	Mostly agree Suggested changes: remove statement on fly tipping, change to "equitable" community waste minimisation initiatives, further inclusion of education and promotion to enable community connection and understanding of residual waste management Comments: benefits should be paid to local community, why is "community" different to business, council or government waste, current leadership/engagement is poor in whenua kaitiakitanga	Removal of "fly tipping" statement and change "support" to "is not a barrier" to waste minimisation initiatives.	Fly tipping has been determined not particularly relevant for this assessment based on feedback. The associated matter of equity will be considered though the Council's process for considering and determining future waste minimisation initiatives. Waste minimisation is outside of scope of this assessment.	The final waste disposal option enables and supports community connection and understanding of residual waste management, and is not a barrier to waste minimisation initiatives.
N/A			Important			
We agree that the disposal option needs to avoid locking us into unsustainable practices in the future. It also needs to support WCC's ambition to reduce waste and could explicitly mention the ambition under the current WMMP and likely enhanced ambition in the next WMMP. Ultimately, we want to see Council explore the pathway to eventually stop landfilling waste generated in Wellington in the future (bar a few exceptions) and use all means available to ensure that landfilling is a last resort. There is a need for an assessment of different waste minimisation scenarios in relation to the WMMP for sensitivity analysis. We believe that despite current data limitations, more modelling is required to understand the current capacity and future lifespan of the current landfill and the lifespan of the two landfill options presented. Sensitivity analysis would be a way to incorporate this as part of the MCA process, or it could be part of the checks and balances following the MCA scoring (as per the Future Waste Options report). There is an overlap with Q14 (robust and reliable) and Q17 (resilience). It makes sense to rationalise these three so each relates to a distinct point: flexibility to change in volumes and composition due to waste minimisation initiatives, resilience to shocks of various sorts and technical robustness of the option. We note that there is other infrastructure that the Council can put in place to manage short term increases in waste due to emergency situations e.g. C&D processing. Resilience needs to consider what type of waste disposal will be needed - likely to be dominated by construction and demolition waste. We also suggest adding wording that recognises that any changes to waste composition must not degrade but rather uphold the wellbeing of Papatūānuku.	SUPPORT AND AMMENDMENT - The Final Waste Option should also have SOME FLEXIBILITY BUILD INTO ITS FRAMEWORK in case of short term significant increases in waste due to emergency situations (E.G. FUTURE EARTHQUAKE/S, OTHER NATURAL DISASTERS, ETC).	*Very important, waste to energy not scalable it will encourage perpetuation of waste to production	Mostly agree Suggested changes: inclusion of "upholding the wellbeing of Papatūānuku", include "flexibility" and define emergency situations. Overlap between Resilience, Scalability and Reliability criteria.	Inclusion of examples of emergency situations in description, and relocation of second half of descriptor to Resilience criteria.	The wellbeing of Papatūānuku is considered across other criteria; not strictly related to scalability of final waste disposal option. Overlap resolved by relocation of the second half of descriptor including examples which provide clarity on emergency situations.	The Final Waste Option will need to support and enable future waste minimisation activities which are likely to reduce tonnages and can significantly change the composition of the waste received.
Critical			Critical			

<p>We agree that WCC is better to focus on options that have a proven track record and that there is expertise in Aotearoa to support. Technical solutions must also work within te ao Māori. This means while technically mature options are preferable, innovation from a Māori world view may open new technologies that best suit the cultural and physical environments here. Just because a technology has been implemented elsewhere does not mean it is a 'success'. 'Less than 5 sites globally' seems a very low bar. 'Technical risks' often become more apparent in the medium to long term as the real impacts and consequences unfold. E.g. EU stance on Waste to Energy Incineration being inconsistent with Circular Economy objectives. Ultimately it is not clear that this criteria is still applicable given most of the previous options have been removed - unless Council was considering looking at different types of Waste-to-Energy technologies? If not, all of the options on the table are well-established.</p>	<p>We are not prepared to commit to this open ended statement</p>	<p>*Same as robustness *The two (technical & robustness) are the same as year other, both relate to same matters</p>	<p>Mostly agree</p> <p>Suggested changes: reference to applicable scale material composition, inclusion of Te Ao Māori and the Māori world view, technical solutions including mature and novel should be considers on what best suits cultural and physical environment of NZ</p> <p>Comments: same as robustness</p>	<p>No changes required.</p>	<p>This criteria considers the technical assessment of the final waste option in relation to replicability and the baseline level of risk associated with the technology.</p> <p>The cultural suitability recognizes values which are fundamentally different from the technical assessment and so may be more suitable under its own criterion.</p> <p>Stakeholder feedback re. "inclusion of Te Ao Māori and the Māori world view" relocated to separate Te Ao Māori criteria for incorporation.</p> <p>Other suggested changes are considered by other criteria.</p> <p>Ten prior examples of this technology at scale balances proven replicability of the process in different environments with retaining a desire to support innovative technology.</p>	<p>Implementing a Final Waste Option that is already established will reduce the technical risks involved. Where a technology has had 10 or more successful uses it is likely to be well understood with suitable parts, operators and expertise. Any option that has been implemented in less than ten sites globally or is still in the research phase indicates that this process is novel and so presents a higher risk for Wellington City Council.</p>
<p>Not important</p>			<p>important</p>			
<p>Agree it is important to have a solution in place for 2026 - we understand both the void space and the consent will run out about this time. We note that viable options to reduce waste disposal prior to 2026 exist and we think these should be explored to enable void space to be preserved. We support adding some wording to this criteria to reflect this.</p>	<p>We are not prepared to commit to this open ended statement</p>	<p>*Main time frame concern for me is knowing fixed deadlines and ongoing process/development, but currently no involvement on Mana Whenua, by the time it gets to them, is it too late?</p>	<p>Mostly agree</p> <p>Suggested changes: important to have a solution for 2026 however reads as prejudgment may be viable options to reduce waste disposal prior to 2026, make statement broader</p> <p>Comments: concerns with late engagement with Mana Whenua</p>	<p>Reference to interim measure removed.</p>	<p>It is important that a final residual waste management solution is implemented prior to the consent expiration, noting that airspace in the current consented area will ruin out prior to the consent expiry.</p> <p>The default interim measure includes exporting waste, the working group indicated that this was not a desirable option as it conflicts with other concerns.</p> <p>In regards to viable options to reduce waste disposal this is beyond the scope of this assessment.</p> <p>Stakeholder feedback re. "late engagement with Mana Whenua" relocated to separate Te Ao Māori criteria for incorporation.</p>	<p>The consent for the Southern Landfill expires in June 2026 and as such the Final Waste Option will need to be constructed and operational before this date.</p>
<p>Critical</p>			<p>Very important</p>			
<p>We believe that the considerations should be wider than 'effects' for the MCA. They should consider impacts and broader outcomes for the local community. It also needs to consider facilities or places like Zealandia and schools which are part of the local community. The language currently focuses on the scale of individual people. What about the livability of the area long-term, the connection of locals to their surrounding environment? This and the following environmental criteria do not consider benefits. The focus is on minimising negative rather than accentuating positive impacts. These 'effects' criteria (8-11) should not just consider the facility itself, but also the effects of the management system overall - i.e. transport, fugitive emissions during transport and storage of waste (not just operation) etc. We also believe some community impacts are relevant to the MCA, while some are more suited to the resource consent process. For example, traffic is relevant here, but litter, odour and noise effects are more resource consent issues. Again, 'no landfill' (exporting waste) could come out well according to these criteria, but it is just transporting litter, odour and noise to another community.</p>	<p>Strongly agree</p>	<p>* Consenting issues not MCA *Yes this is consenting issue not MCA</p>	<p>Agree</p> <p>Suggested changes: wider 'effects' should be considered in this criteria, redundant as it is part of the consenting process not MCA</p>	<p>No changes required.</p>	<p>The wider impacts can be addressed within the wider Community criteria.</p> <p>Noise, odour and other community effects are not explicitly addressed in the consenting criterion and effect on local community up to or beyond consentable limits should be addressed as part of the MCA process.</p>	<p>The Final Waste Option should minimise effects on the local community, including odours, noise, and traffic impacts that will disrupt residents, workers and visitors of the surrounding area.</p>
<p>Very important</p>			<p>Very important</p>			
<p>Agree this should be included. Again, this narrowly focuses on effects rather than impacts and broader outcomes. We would like to see each of these 'environmental effects' criteria (Q9-11) broadened for the MCA process to ensure that tikanga and te ao Māori are upheld, and long-term impacts and ecosystem outcomes are considered. The description makes it sound like it is just the water quality and not the broader environmental, cultural and social impacts of degraded waterways. These 'environmental effects' criteria should be consistent with Te Titiriti o Waitangi, especially Article 2 which guarantees tino rangatiratanga to hapū over their lands, waters and natural resources. For example in p.11 of the Government's recent Regulated Product Stewardship Tyres and Large Batteries consultation, it states: "Poor management of products when they become waste can damage taonga that are guaranteed protection under Te Titiriti o Waitangi – for example, through direct pollution of water, air and land, and indirectly through contribution to climate change." This relates to the wider waste management system too, in the sense that environmental effects/impacts can occur beyond the facility itself - e.g. truck movements, leakage from waste capture - and throughout the lifecycle of products and materials that become waste. The residual waste option available can influence how these products/materials move around the economy (another reason why it's hard to separate upstream activity from residual waste options), and thus the environmental effects/impacts of these broader connected elements of waste and materials management should be included.</p>	<p>STRONGLY AGREE</p>	<p>* Very important especially in relation to Te Tiriti obligations</p>	<p>Mostly agree</p> <p>Suggested changes: environmental effects should be consistent with upholding tikanga, Te Ao Māori and Te Tiriti obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). Final options should include a roadmap for replenishing, reinvigorating, and depolluting both the open and closed waterways.</p>	<p>Addition of "adverse", and inclusion of upholding tikanga and Te Ao Māori.</p>	<p>The adverse effects considered only for clarity, inclusion of the Māori world view acknowledges the broader environmental, cultural and social impacts.</p> <p>The final residual waste management option will also need to consider after closure effects and remediation as part of this dimension.</p> <p>Stakeholder feedback re. "Te Tiriti obligations in relation to ensuring tapu is protected" relocated to separate Te Ao Māori criteria for incorporation.</p>	<p>The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse effects to waterways and surrounding aquatic environments i.e. emissions to watercourses.</p>
<p>Very important</p>			<p>Critical</p>			
<p>Agree this should be included. See response to Q9.</p>	<p>Strongly agree</p>	<p>*Environmental Emissions reducers and eliminations (air, water, land) are critical in ensuring tapu is protected and the solution is not in breach of the Te Tiriti (desecration of taonga) *Very important in relation to Te Tiriti obligations</p>	<p>Mostly agree</p> <p>Suggested changes: environmental effects should be consistent with upholding tikanga, te ao Māori and Te Tiriti obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). Final option needs to show a roadmap of replenishing, reinvigorating and reintroducing natural and fragile flora and fauna.</p>	<p>Addition "adverse", and inclusion of upholding tikanga and te ao Māori.</p>	<p>The adverse effects considered only for clarity, inclusion of the Māori world view acknowledges the broader environment, cultural and social impacts.</p> <p>The final residual waste management strategy will need to consider after closure effects and remediation as part of this dimension.</p> <p>Stakeholder feedback re. "Te Tiriti obligations in relation to ensuring tapu is protected" relocated to separate Te Ao Māori criteria for incorporation.</p>	<p>The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions and contamination to surrounding land.</p>
<p>very important</p>			<p>Critical</p>			

Agree this should be included. See response to Q9.	Strongly agree	* Very important especially in relation to Te Tiriti obligations	Mostly agree Suggested changes: environmental effects should be consistent with upholding tikanga, Te Ao Māori and Te Tiriti obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). Final option must be to achieve as close to zero air emissions as current technological solutions enable.	Addition "adverse", and inclusion of upholding tikanga and Te Ao Māori.	The adverse effects considered only for clarity, the inclusion of the Māori world view acknowledges the broader environment, cultural and social impacts. The final residual waste management option will need to consider after closure effects and remediation as part of this dimension. Stakeholder feedback re. "Te Tiriti obligations in relation to ensuring tapu is protected" relocated to separate Te Ao Māori criteria for incorporation.	The Final Waste Option must uphold tikanga and Te Ao Māori to minimise adverse emissions to air (including from transport) e.g. particulate or VOC emissions.
Very important			Critical			
Agree that this is a useful criteria. We suggest adding wording to consider the urgency of the issue, to reflect a willingness to go beyond the constraints of existing policies which come with existing limitations, and consider bold, brave, innovative and creative approaches.	Without wider consultation and community discussion we are reluctant to commit to answering this question the way it is worded	*Important as time is limited *is important give the time constraint, probably precludes waste to energy *lower process will have to show Te Ao Maori and Te Tiriti partnership has been worked through in relation to this	Mostly agree Suggested changes: inclusion of innovative, brave and creative approaches and a willingness to go beyond constraints of existing policies and limitations, consider the urgency of the issue and government policy, need to show work in regards to Te Ao Māori and Te Tiriti partnership as part of this process.	Addition of "and alignment with central policy direction", removal of second half of descriptor.	Government policy must be considered in line with the Council's aims and obligations, the statement has been amended to avoid ruling out suitable options which may have no track record within NZ. Stakeholder feedback re. "Te Ao Māori and Te Tiriti partnership as part of this process" relocated to separate Te Ao Māori criteria for incorporation.	The Final Waste Option should have a strong likelihood of approval given existing policies, and alignment with central policy direction.
Very important			Very important			
The aim should be to maximise value rather than minimise cost. Minimising cost is not adequate on its own - economic implications need to be considered in context. Value is a deep concept that does not relate to money alone - it needs to be considered from an intergenerational perspective, and should prioritise the restoration of the wellbeing of Papatūānuku as a core value. Even the concept of 'value for money' should attempt to account for externalised costs to the environment and community, though the methodologies for doing this are likely underdeveloped. Value for money is about the optimum combination of fitness for purpose and whole of life cost. It is not clear who the cost will be minimised for - only in terms of WCC budgets or best value for Wellington City as a whole including businesses and households paying user charges and gate fees? 'Cheap' options often come with hidden costs and/or push cost and risk out into other parts of the system. A broader framing of value enables opportunity cost to be considered. There is a need to do this so that we have transparency about what Council is choosing not to invest in or enable by picking specific options, e.g. the opportunity costs of continued reliance on disposal over lost local economic development and jobs in waste reduction and minimisation. 'Recycled products' is not an appropriate aspect to include given the options left.	Minimising environmental impacts is more important. That said, there would be a fair expectation that better technology, increased efficiencies would bring costs down long term		Somewhat agree Suggested changes: expansion on assessment measures used or simplification of statement, inclusion of the intergeneration perspective and restoration of the wellbeing of Papatūānuku Comments: funding options need to be considered for the life of the option, aim to maximise value rather than minimise cost, need to account for externalised costs	Addition of consideration from an intergenerational perspective	Agree with community stakeholder assessment that this criterion needs to provide value for money for Wellington City ratepayers, while enabling intergenerational cost perspective. This has been integrated as accounting for externalising past/future costs, this includes having financial reserves in place for rehabilitation after closure and ensuring wellbeing for future generations. Stakeholder feedback re. "restoration of the wellbeing of Papatūānuku" relocated to separate Te Ao Māori criteria for incorporation.	The Final Waste Option should provide overall value for money for Wellington City ratepayers and ensures any financial investments takes into account intergenerational costs considerations.
Slightly important			Important			
This is related to Q5 and Q17. Some overlaps between scalability, technical reliability/robustness and resilience need to be resolved. This criteria seems to relate to the ability of the disposal option to adapt to changes to waste content in an emergency or exceptional circumstances, and ability to handle hazardous or unusual materials that cannot be processed elsewhere. We note that there is other infrastructure that the Council can put in place to manage short term increases in waste due to emergency situations e.g. C&D processing. We would assume that any disposal option chosen would be fit for purpose and functional.	Agree	*Same as technical maturity *The two (technical & robustness) are the same as year other, both relate to same matters	Mostly agree Suggested changes: removal of 2nd statement Comments: overlaps between scalability, technical maturity and resilience	No changes required.	The final waste option must have the capability of the system to operate consistently when required.	The Final Waste Option should be robust and reliable enough to handle changes in incoming waste content, and any equipment should be available and online for as close to 100% of its required operational hours as possible.
Very important			Very important			
Not needed. This Question is only relevant if the disposal option is generating a "product". The Pre-sort options have been taken out of the list so no longer relevant.	As this appears to be the case currently, we see this likely to continue into the foreseeable future	*No longer relevant as only looking at disposal options (no marketable product) *I agree	Somewhat agree - may not be relevant if no marketable product is produced Comments: consideration of community based resource recovery solutions, would require an economic plan in line with OBRA's vision	Remove criteria.	This criteria is no longer relevant to the final waste options as there will be no marketable product.	
N/A			Very important			
Is this needed? Has the work done to date has already ascertained this? If such a criterion is used, it should also consider how it relates to a wider network view of satellite and decentralised waste minimisation and recovery sites/hubs throughout the city, and is designed to integrate into that network.	It is assumed by the term site, it is the whole WCC engineered landfill (currently used and potential sites to be used for new stage/s) area not just the existing stages, then yes.	*Less relevant now that *The waste to energy is a regional solutions, too big for Southern landfills	Somewhat agree Suggested changes: may be a limiting constraint, regional solution size is beyond Southern landfill, statement should include of network approach (decentralisation and integration)	Addition of commentary of wider waste network.	Practical criteria as the Southern Landfill has been designated under the district plan as such the wider network view has been integrated into this statement. For the waste to energy option it is conceptualized on a Wellington City scale.	The Final Waste Option should be able to fit within the existing site, or be able to integrate into existing waste network.
Not important			Important			
This is related to Q5 and Q14. Some overlaps between scalability, technical reliability/robustness and resilience need to be resolved. Apart from the need to emphasise the compatibility of the option with an ambitious waste minimisation programme (Q5), these points otherwise relate to risk associated with disruption to services and ability to access the disposal option. This one seems to be about the availability of the facility itself due to civil emergency type events due to earthquake, Tsunami etc., although reliability (Q14) considers some of these issues too.	This assumes flexibility it disposal methods and types, so agree	* Key for earthquake, etc, having capacity, flexibility, peaks & troughs *Scalability and reserved capacity for the future event, resilience also required	Agree Comments: overlaps need to be resolved	Integration of content removed from Scalability criterion.	Provide greater clarity and reduces overlap with Scalability criterion.	The Final Waste Option should also have resilience in case of short term significant increases in waste due to emergency situations (e.g. earthquakes or other natural disasters). This will consider day-to-day waste transport corridors including whether the option is based locally or outside the Wellington region.
Very important			Very Important			

<p>Having a single criteria relating to Te Tiriti and partnership options does not seem like a useful approach to us. This needs to be considered as an overarching obligation, which must inform all subsequent systems and proposals, to uphold the commitments in Te Tiriti, and ensure long term resilience and wellbeing of taiao and whakapapa for tangata whenua. Responsibilities and consequences need to be embedded into all of the criteria - in particular the 'environmental effects' criteria, Q9,10,11. We see council's Tiriti relationship covering more than just 'consultation' with mana whenua on a proposed course of action. Council also needs to separate out the various strands of obligations and considerations: 1. Partnership with mana whenua - embedded in long term relationship 2. Te Tiriti articles - WCC responsibilities in relation to these 3. Te Tiriti principles 4. Te ao Māori - worldview 5. Mātauranga - practical wisdom and knowledge</p>	Agree		<p>Comments: Core, overarching criteria/obligation which needs to be set in conjunction with local Iwi, which informs all subsequent systems and proposals. It is critical to align with te ao Māori and uphold the commitments in Te Tiriti as it informs all subsequent systems and proposals, must reflect the changed palate of the community which are culturally and socially sustainable not just business focused. The council has obligations and considerations to uphold in regards to their partnership with Mana Whenua, Te Tiriti, Te Ao Māori and Mātauranga.</p> <p>Comments relocated from other criterion: * The technical maturity criterion considers the technical feasibility within the physical parameters of NZ, but it is also important to consider the cultural suitability of different option. WCC recognizes there are te ao Māori-specific values which are not explicitly covered in other criteria so have discussed capturing these in a separate criterion. * In regards to timeframe there are concerns regarding engagement with Mana Whenua. * In relation to adverse environmental effects on land, air and water, this should be consistent with upholding Te Tiriti o Waitangi obligations in relation to ensuring tapu is protected - includes the wider environmental, cultural and social impacts of the waste management system (beyond the facility itself). * Within the consenting and planning process work needs to be shown in regards to Te Ao Māori and the Te Tiriti partnership. * In terms of Value for Money the final waste option should invest adequately into the restoration of the wellbeing of Papatūānuku.</p>	All relevant feedback summarised in new criteria	<p>Wellington City Council recognises the significance of Te Tiriti and its own obligations and commitments to the principles contained within.</p> <p>We agree with the community stakeholder assessment that this is a core criteria and overarching obligation that must inform all subsequent systems and proposals. WCC has endeavoured to integrate this viewpoint into the design and construction of all criteria.</p> <p>We have determined that some feedback and recommendations identified within the community stakeholder assessment of other criteria, including: - the importance of preserving and restoring wellbeing of Papatūānuku, - the need for an assessment of cultural suitability of the option, and - the need for partnership with Mana Whenua, are more appropriate for integration into this overarching criterion.</p>	The Final Waste Option should uphold Te Ao Māori and uphold the commitments of Te Tiriti o Waitangi, to ensure the protection of tapu, the wellbeing and restoration of Papatūānuku, and provide options which are suitable for the physical and cultural environment of Aotearoa. As part of this, a strong partnership with Mana Whenua must be embedded within the foundation of the option.
Critical			Critical			
<p>1. The Final Waste option must align with Council's strategic principles and priorities. Council has a clear set of strategic goals and outcomes as well as specific relevant plans and targets that need to be considered, and the national policy and strategic context set by central government must also be considered. We would expect this type of analysis to be done as a matter of course in any specific council decision making process, but feel that this should be emphasised when considering options. 2. Human health impacts do not appear to be specifically included in any of the criteria. This may be implied in the environmental effects criteria as flow on consequences for humans, but it would be useful to include a specific criteria for this.</p>			<p>* Criteria regarding Te Ao Māori should be first * Criteria for human impacts should be added * When considering options emphasis on alignment with Council's strategic principles & priorities.</p>	No key themes or required changes from these comments.	Human impacts are assessed in environmental impact and community impact statements; council's aims considered in a number of criteria.	
Critical, Very important						
<p>Do not support. This option does not incentivise the Council to reduce waste volumes, it is high cost, requires significant earthworks (with their own environmental costs), environmental impacts associated with encroaching on undeveloped land, large parts of regenerating native forest in the valley will be destroyed, and may create additional problems for Zealandia in the form of litter.</p>	To GBRAI this has always been the most likely solution		<p>Mostly do not support</p> <p>Comments: May provide time for developing technologies, however may not be the best use of funds and may not incentivise waste reduction. Concerns regarding increased wind blown pollution resulting in odour, increased pests & risk of breaches (Zealandia), costs, environmental & ecological impacts. Further assessment of impacts required.</p>			
<p>Strongly support. This option seems most consistent with an ambitious waste minimisation action plan going forward, provided that sites for greenwaste composting and resource recovery facilities can be found. We do have concerns that this option does not remove the continued reliance on the current stream diversion tunnel or mitigate the consequences of a tunnel collapse and the resulting accidental lake forming north of the existing stage 3 landfill. We would like to understand if the waste team and engineering consultants have looked at the potential to mitigate these consequences at the same time. We would like to understand if there is the possibility for a piggyback option with additional engineering work that also mitigates the risk of tunnel collapse.</p>	To GBRAI this is an interesting newer option, but without some better financial breakdowns between the stage 4 and the "piggy back option"- and future cost options when the piggy back is filled - we are reluctant to comment		<p>Mixed - some strong support as opposed to the landfill extension. Preference for Interim extension for WMMP decision making on waste volumes/types.</p> <p>Comments: concerns regarding relocation of composting operations and further assessment required of cost breakdowns, stream/tunnel collapse mitigation and impacts of annual waste volume reduction.</p>			

<p>Strongly do not support. This option is least consistent with an ambitious waste minimisation plan. We agree with and support the Zero Waste Network's position on Energy from waste/Waste to energy technologies: https://zerowaste.co.nz/waste-to-energy-incineration/</p>	<p>Unrealistic. Wellington/greater Wellington is not large enough as a metro area, this system perpetuates waste creation to keep the incineration plant in operation, is hideously expensive, while it creates energy it creates its own waste, and is viewed as incompatible with the waste minimisation process we as a country and a city/region are on</p>		<p>Strongly not supported as a residual waste option - may be considered at an upstream level</p> <p>Comments: similar waste disposal solution rejected by EU, challenge with fitting it into a circular economy, concerns regarding waste burnage, final waste volume, efficiency, cost, site footprint, perpetuation of waste creation rather than reduction, along with an incompatibility with the NZ and city/regional waste minimisation process</p>			
<p>Support as longer term goal - 20 years, following piggyback option and rapid reduction of landfill waste. However, we do not have enough information or know if sufficiently detailed analysis has been done to properly comment on whether this should be an option to consider or not, particularly for the short term but also longer term. We think that a holistic, regional view is needed to better understand existing and future infrastructure asset needs to ensure capital investment is spent in the right way.</p>	<p>Unrealistic, other areas will become reluctant/oppose metro wellingtons waste being exported and filling their landfills. costly, inefficient, does not encourage waste minimisation and likely to be blocked by locals in the area waste is being sent to.</p>		<p>Mixed - but mostly do not support as a current option, but instead support as longer term goal (~20 year) after landfill waste reduction/following piggyback option.</p> <p>comments: Limits city control on waste, increases costs, inefficient and does not encourage waste minimisation (shifts issue). Possible extension beyond Wellington region, however reluctance/opposition of waste exports to other landfills.</p>			
<p>We want to see the following points as part of framing the options for consultation: 1. Conditions must be attached to any landfill option so that the consent supports landfill being a destination of last resort. 2. Any option needs to be set within the context of a strong revised WMMP with associated financial resources for implementation. 3. Council should continue to consider if there are any other potential short term trade-offs, such as a complimentary alternative treatment option for some of the sludge, following appropriate consultation with mana whenua. We would also welcome official Council engagement with novel and complementary approaches to reducing sewage sludge, as were explored during the recent Beyond the Pipes Symposium at Greater Wellington Regional Council. 4. Recognising that this is outside of the control of the waste operations team, Council should seek to use their influence to improve practices at the other landfills in Happy Valley. The C&D landfill is on Council leased land, we request that Council use their influence and engage with the operators to ascertain what is planned and what could be achieved collaboratively.</p>	<p>It is somewhat frustrating that the discussions to date have circled around - and come back to - the stage 4 expansion of the Southern Landfill. The incineration & trucking wellingtons waste elsewhere have been previously discussed and dismissed by both the Community Liaison Group (WCC, Greater Brooklyn Residents Association Inc, Owhiro Bay R/A) and the wider community who has been keeping a close eye on the landfill(s) operations a number of years ago. There have been missed opportunities over the last three to five years or so to progress sensible, direct and honest discussion about the WCC landfill extension. This groups two meetings to date have, candidly, barely moved discussions forward - but I will acknowledge they have moved forward - as the terms of reference and initial agenda have been, to be diplomatic, confusing and not up front. We are looking beyond these discussions to a wider community engagement and hope WCC remains committed to continuing real and genuine community and waste industry engagement</p>	<p>the questions do not appear to have any Maori lens across them limiting the potential exciting and innovative solutions & approaches to the questions/issues proposed</p>	<p>* Statements/questions lack a Māori lens limiting potential innovative solutions and approaches. *Conditions should be attached to any landfill option so that consents support landfills as a last resort destination *Options set within the context of a strongly revised WMMP *Council should continue to consider if there are other potential short-term trade-offs</p>			



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Southern Landfill: Piggyback Option and SLS4

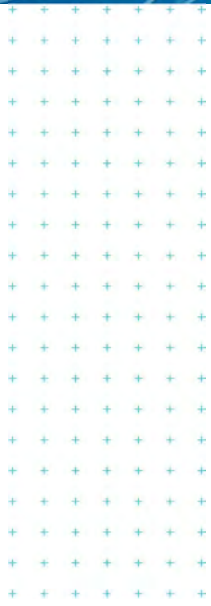
Resource Consent Risks and Opportunities

Prepared for
Wellington City Council Waste Operations

Prepared by
Tonkin & Taylor Ltd

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Executive summary

Wellington City Council (WCC) Waste Operations are considering options to provide additional airspace at Southern Landfill, Happy Valley, Wellington. The current design options are known as the 'piggyback' option, and Southern Landfill Stage 4 (SLS4). WCC have requested a high-level assessment of the consenting risks and opportunities for both options, which are discussed in this report.

The 'piggyback' option proposes a new landfill development over the top of a closed landfill at the site (known as Stage 2), and would provide 2 million cubic metres of landfill airspace. The location and subsequent construction of the landfill would generally avoid the removal of large areas of vegetation and would include the reclamation of a swale drain that was established as part of the closure of the previous stage of the landfill.

The SLS4 option is located north of the current landfilling activities and would fill in an area further up the valley currently in regenerating bush cover, along with the reclamation and piping of Carey's Gully Stream and construction of a regenerated stream. This option provides 2.5 million cubic metres of landfill airspace.

Both options will be fully lined landfill in accordance with WasteMINZ technical guidance.

The requirement for offset or compensation to mitigate the ecological effects of the project will be greater for SLS4.

As both options will require the discharge of contaminants to Careys Gully Stream, both options require resource consent as a non-complying activity. Therefore, the applications for both options will need to pass the gateway test under section 104D of the RMA, before it can be considered for a decision.

Although there are consenting challenges for both options, overall, we consider that the piggyback option is the least complex from a resource consent perspective. This option requires the least area of vegetation clearance (including the proposed borrow area) and requires the shortest length of stream reclamation and piping of a lower quality stream, however the piggyback option provides a smaller available airspace volume and therefore will not provide the same longevity for the facility.

1 Introduction

1.1 Overview

We understand Wellington City Council Waste Operations would like a high-level assessment of the consenting risks and opportunities to provide additional airspace at Southern Landfill, Happy Valley, Wellington. The design options are known as the 'piggyback' option, and Southern Landfill Stage 4 (SLS4).

1.1.1 'Piggyback' option

The 'piggyback' option proposes to establish a new landfill area mostly on the top of an existing closed landfill at the site (known as Stage 2). This area is currently where the existing composting windrows and container storage area are located, which would be moved to another location within the site if the piggyback option was progressed.

This option proposes a new, fully lined landfill in accordance with WasteMINZ technical guidance. This option would provide approximately 2 million cubic metres of landfill airspace. The location and subsequent construction of the landfill would generally avoid the removal of large areas of vegetation. This option includes the reclamation of a swale drain that was established as part of the closure of the previous stage of the landfill, which may be classified as a stream (we suggest the swale drain is assessed by a freshwater ecologist to confirm status).

This option also includes a borrow area, to obtain the required cover material for landfilling operations. The general location and layout is shown in Figure 1.1 below.

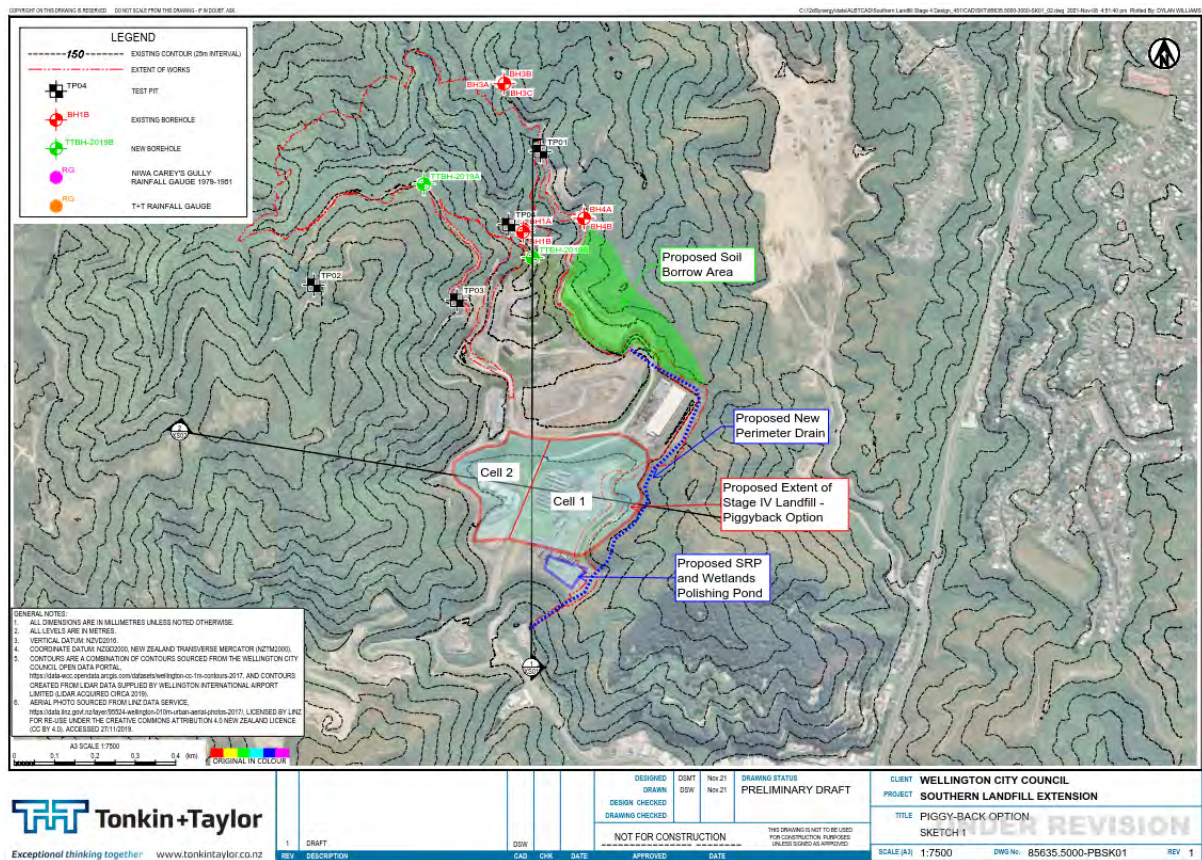


Figure 1.1 Location and layout of Piggyback option

1.1.2 Southern Landfill Stage 4 (SLS4)

The SLS4 option is located north of the current landfilling activities, and would fill in an area further up the valley. This area of the valley is currently in regenerating bush cover. This option will include a 100m gap between the current Stage 3 extent and involves the piping of streams and construction of a regenerated stream. Cover material for landfilling options will be obtained from the earthworks required to construct the landfilling stages.

This option proposes a new, fully lined landfill in accordance with WasteMINZ technical guidance. It will provide approximately 2.5 million cubic metres of landfill airspace. The location and subsequent construction of the landfill does require the removal of a large area of vegetation, and the reclamation of part of Carey's Gully Stream, as it is located in a valley adjacent to the existing landfill operational area.

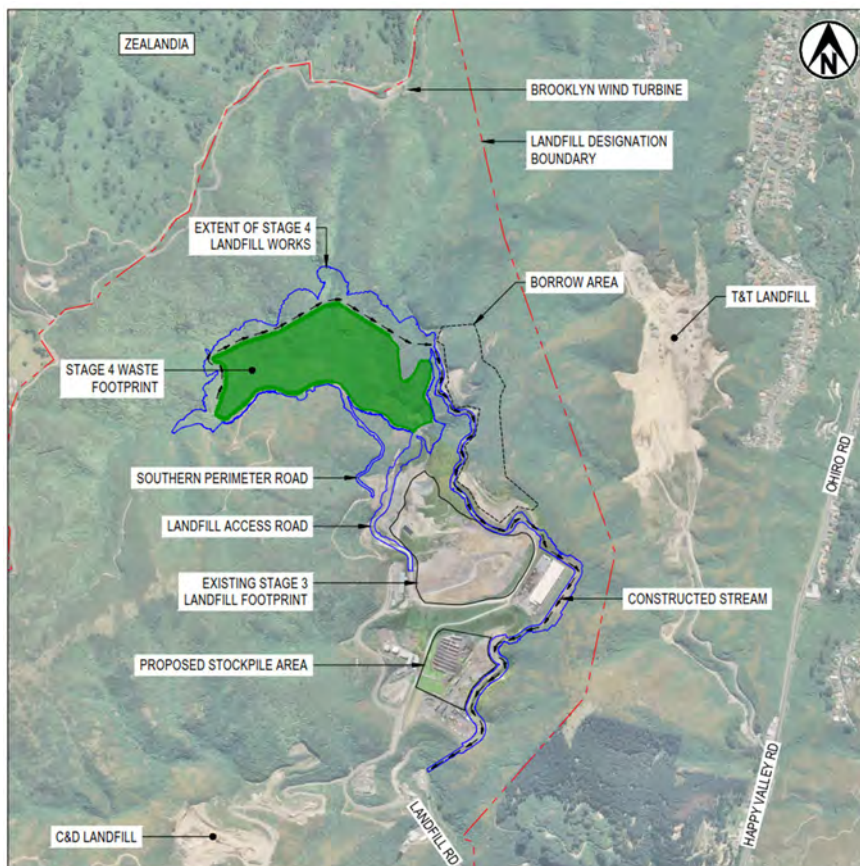


Figure 1.2 Location and layout of SLS4 option

2 Likely consent requirements

2.1 High-level comparison of the options

Table 2.1 below summarises the key consent requirements for both design options at a high level. Overall, both design options generate similar consenting requirements, however the scale of activity and resulting likely effects differs between the designs. The number of ticks in the table below denotes the anticipated general level of effect and scrutiny afforded to each of the aspects identified (i.e. the more ticks, the greater the likely potential effect).

Table 2.1: Consent and approvals likely for both options

Consent/approval requirements	Piggyback option	SLS4 design
Discharge of dust, landfill gas and odour to air	✓	✓
Discharge to land from landfilling activities	✓	✓
Discharge of stormwater to land/water	✓	✓✓
Discharge of contaminants to land/water	✓	✓
Earthworks	✓	✓✓
Stream reclamation	✓	✓✓✓
Damming and diversion of water	✓	✓✓✓
Vegetation clearance	✓	✓✓
Wildlife Act permits	✓	✓✓
National Environmental Standard Contaminated Soil	✓	✓
National Environmental Standard Freshwater	✓	✓✓
National Environmental Standard Air Quality	✓	✓
Designation – Outline Plan of Work	✓	✓✓

3 Risks and opportunities

The piggyback option will be constructed mostly over the top of a previous stage of the landfill which is not lined, and the quality of the cap is not known. Therefore, consideration of the potential effects of placing additional waste on top of this previous landfill stage should be considered in the design of this option.

The piggyback option is located within a part of the site already modified by landfilling activities, and unlike SLS4 it does not involve landfilling in a new valley which requires removal of a significant area of high-quality regenerating bush. Although the removal of vegetation is also required for the piggyback option, the quality of vegetation and the area of removal is less than SLS4.

Similarly, piping and the associated reclamation of stream bed is required for both options, although the extent of removal is significantly less for the piggyback option than SLS4. Further, the swale drain that would be reclaimed as part of the piggyback option appears to be of lower quality than the stream that would be reclaimed for SLS4, although the status of the swale drain will be assessed by a freshwater ecologist to confirm its status.

The above activities will require offset or compensation to mitigate the ecological effects of the project, however the extent of offset or compensation required, and scrutiny of the proposal is yet to be determined, however it will be greater for SLS4.

The definition of ‘regionally significant infrastructure’ (RSI) in the Proposed Natural Resources Plan has been confirmed and the consent order issued, following appeal. Landfills are now listed as RSI and can therefore rely on the supporting policies for RSI in the PNRP. In turn, this means that landfills are now defined as ‘specified infrastructure’ in the National Policy Statement for Freshwater Management 2020 and are afforded a number of exclusions under the NPS-FM policy framework.

As both options will require the discharge of contaminants to Careys Gully Stream, which is a tributary to the Owhiro Stream and is listed as a site of significance in Schedule F1 of the PNRP, both options require resource consent as a non-complying activity. Therefore, the applications for both options will need to pass the gateway test under section 104D of the RMA, before it can be considered for a decision.

Both options will require resource consents for earthworks and vegetation clearance activities. Permits under the Wildlife Act are also likely, given the nature of the regenerating bush in the area, although the loss of this bush is far less for the piggyback option compared to SLS4.

We have assumed that landfill gas will be managed in the same way for both options, and the lining systems will both comply with WasteMINZ technical guidelines and industry good practice. We have also assumed that stormwater, leachate, and clean surface water will be separated and managed appropriately for both options.

4 Review of the Wellington City District Plan

Wellington City Council (WCC) have released the Draft Wellington City District Plan for feedback. While the Draft Plan does not have any statutory status at this stage of the process, it provides a strong indication of the direction the Council wishes to take for the notified version. We understand that WCC intends to notify the Proposed Plan in mid-2022.

The Draft District Plan shows the existing landfill designation being 'rolled-over' into the Draft Plan, reference 'Careys Gully Landfill' and its purpose is 'Refuse disposal and associated works'. The Draft Plan maps show that almost the entire designation area (excluding the current active landfill areas) have been identified as a Significant Natural Area (SNA).

While the designation prevails over the SNA overlay and the associated district plan rules, the presence of an SNA overlay in this location is at the very least a conflict within the Plan, and it will likely have implications for the future management and operation of the landfill, including future development.

Namely, the SNA overlay may affect the Outline Plan process. An Outline Plan must include discussion and a description on how any adverse effects are to be avoided, remedied or mitigated. The specific SNA (ref WC135 in the Draft Plan) summarises the native plant and animal species (including at risk species) likely to be present in the site. It may be difficult to avoid, remedy or mitigate effects on the features the SNA is trying to protect. This issue will need to be considered each time that an Outline Plan is required for works within the landfill area.

An Outline Plan would be required as part of the landfill development process, and with an SNA overlay in place Council may request changes to the Outline Plan (and consequently the design and operation of the landfill), although the requiring authority (WCC Waste Operations) can decline this request. However, Council, in its capacity as regulatory authority can appeal to the Environment Court if the requiring authority does not accept the changes requested.

We recommend monitoring progress with this plan review process as the Plan is further developed.

5 Interested parties and consultation

In general, the interested parties are likely to be similar for both the piggyback and SLS4 options, including the Friends of Owhiro Stream, mana whenua, and Wellington Water.

Neighbouring property owners are also likely to be interested, and we note that the piggyback option is further away from Zealandia than SLS4. The piggyback option is closer to the suburb of Kingston (east) and further away from Brooklyn (north) than SLS4. This is likely to change the area of interested people although Brooklyn residents may still be interested in the potential traffic effects of both options.

6 Designation and Outline Plan

Both the piggyback option and SLS4 are located entirely within the existing designation for Southern Landfill. Both options will require an Outline Plan to be provided to Wellington City Council (as regulatory authority). We understand that Beca has undertaken assessments on traffic, noise and landscape effects to support the Outline Plan for SLS4. We consider that these assessments could also form the basis of the assessments for the piggyback option (with some minor updates and adjustments to allow for the location of the piggyback option within the designation site).

7 Conclusions

Although there are consenting challenges for both options, overall we consider that the piggyback option is the least complex from a resource consent perspective. This option requires the least area of vegetation clearance (including the proposed borrow area), and requires the shortest length of stream reclamation and piping, however it will also provide a smaller available airspace volume and therefore will not provide the same longevity for the facility.

8 Applicability

This report has been prepared for the exclusive use of our client Wellington City Council Waste Operations, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.


Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:



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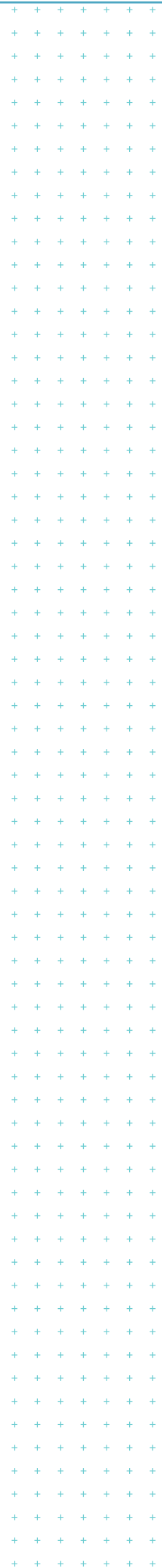
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Hugh Cherrill
Project Director

21-Dec-21

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Southern Landfill: Piggyback Option

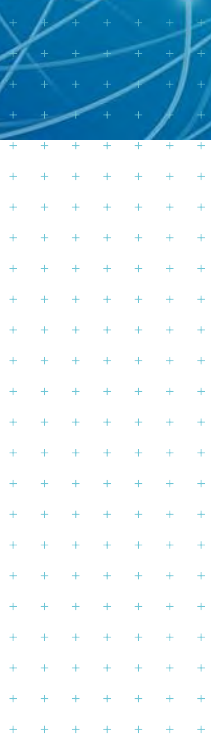
Concept Design, High Level Budget Estimate and Program

Prepared for
Wellington City Council Waste Operations

Prepared by
Tonkin & Taylor Ltd

Date
January 2022

Job Number
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Executive summary

Wellington City Council (WCC) Waste Operations are considering options to provide additional void space at Southern Landfill, Happy Valley, Wellington. The current design options are known as the piggyback landfill option and Southern Landfill Stage 4 (SLS4).

WCC have requested a high-level concept design and high-level budget estimate for the piggyback landfill. Along with this, WCC have also requested a landfill development program comparison between the piggyback landfill and SLS4. This report presents the outcome of the three tasks and discusses the pros and cons between piggyback landfill and SLS4.

The piggyback landfill option proposes to establish a new consented landfill area mostly over the top of an existing closed landfill at the site (known as Stage 2), and would provide approximately 2 million cubic metres of landfill void space. The location and subsequent construction of the landfill would generally avoid the removal of large areas of vegetation and would include the reclamation of a swale drain that was established as part of the closure of the previous stage of the landfill.

The SLS4 option is located north of the current landfilling activities and would fill in an area further up the valley currently in regenerating bush cover, along with the reclamation and piping of Carey's Gully Stream and construction of a regenerated stream. This option provides approximately 2.5 million cubic metres of landfill void space.

Although there are engineering challenges for both options, overall we consider that the piggyback landfill option is the least complex with least risk from a design and construction perspective. The piggyback landfill option also requires a lesser construction cost compared to the SLS4 option.

The landfill development program illustrates that the piggyback landfill option can be ready to receive waste by the current consent expiry date of June 2026 if the project progresses by January 2022, the resource consent is approved by September 2024 and construction of the piggyback landfill starts by October 2024. By contrast, it is not possible for SLS4 to be ready to receive waste by the current consent expiry date of June 2026. If the SLS4 project were to progress by January 2022, completion of SLS4 ready to receive waste is envisaged to be in January 2028, 1.5 years after the expiry date of the existing resource consent

1 Introduction

1.1 Overview

Tonkin & Taylor Ltd (T+T) has been assisting Wellington City Council Waste Operations (WCC) with the design and consenting aspects for the development of Southern Landfill Stage 4 (SLS4). WCC has now requested T+T to carry out:

- A high-level concept design of a piggyback landfill option;
- A high-level budget estimate for the development of the piggyback landfill option; and
- A high-level landfill development program for the piggyback landfill option in comparison to the SLS4 option.

This report has been prepared as a variation to T+T's contract with WCC for SLS4 dated 15 August 2019.

1.2 Background

1.2.1 'Piggyback landfill' option

The piggyback landfill option proposes to establish a new consented landfill area mostly over the top of an existing closed landfill at the site (known as Stage 2). This area is currently used for windrow composting and utilised as a storage area. These activities would be relocated to another location within the landfill designation area if the piggyback landfill option was progressed.

This option proposes a new, fully lined landfill in accordance with WasteMINZ technical guidance. This option would provide approximately 2 million cubic metres of landfill void space. The location and subsequent construction of the landfill would generally avoid the removal of large areas of vegetation. This option includes the reclamation of a swale drain that was established as part of the closure of the previous stage of the landfill.

This option also includes a borrow area, to obtain the required cover material for landfilling operations. The general location and layout is shown in Figure 1.1 below.

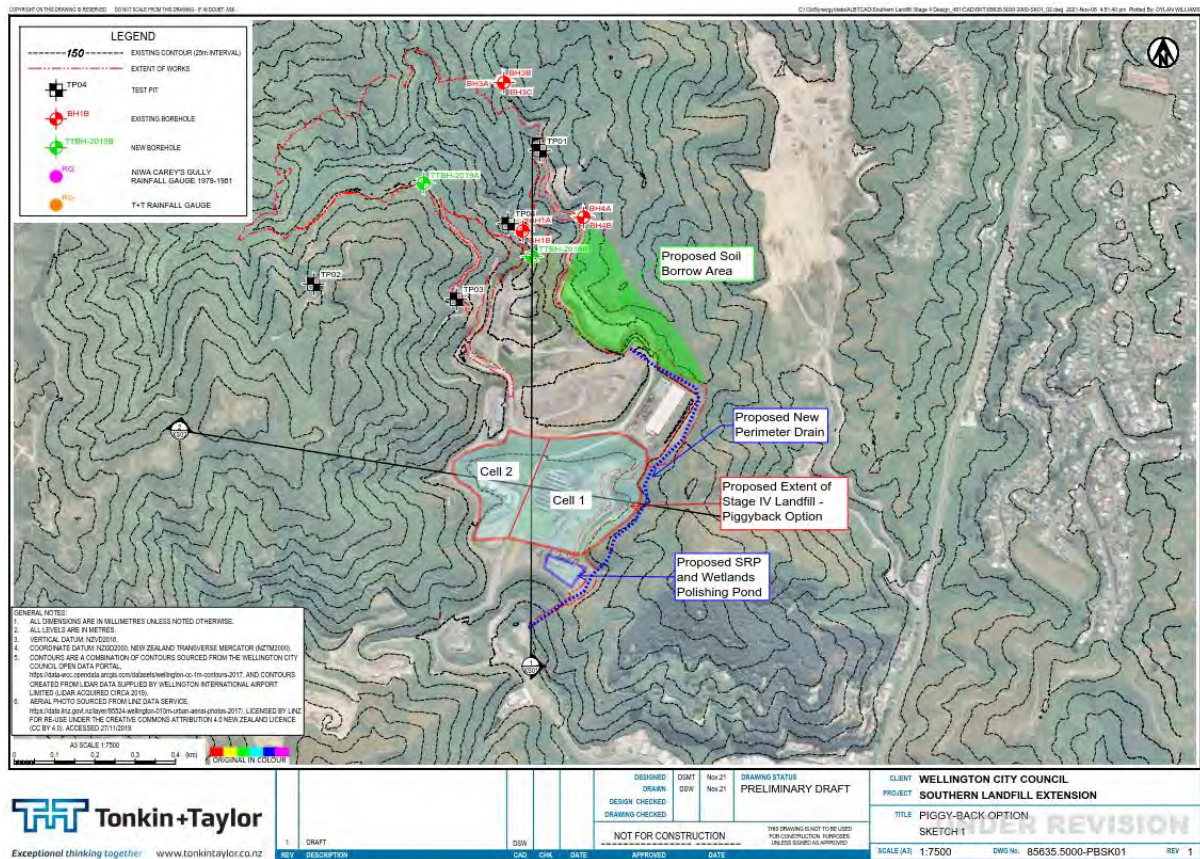


Figure 1.1: Location and layout of Piggyback option

1.2.2 Southern Landfill Stage 4 (SLS4)

The SLS4 option is located north of the current landfilling activities, and would fill in an area further up the valley. This area of the valley is currently in regenerating bush cover. This option would include a 100 m gap between the current Stage 3 extent and involves the piping of streams and construction of a regenerated stream. Cover material for landfilling options would be obtained from the earthworks required to construct the landfilling stages.

This option proposes a new, fully lined landfill in accordance with WasteMINZ technical guidance. It would provide approximately 2.5 million cubic metres of landfill void space. The construction of the landfill would require the removal of a large area of vegetation, and the reclamation of part of Carey's Gully Stream, as it is located in a currently undeveloped valley adjacent to the existing landfill operational area.

The SLS4 landfill has been shaped to provide maximum landfill void space. It is not likely that any further piggyback landfill can be constructed over the SLS4 final cap profile without affecting the landfill stability. Should WCC waste operations wishes to increase the landfill capacity of SLS4, the footprint of the SLS4 landfill will need to be increased.

This option also includes a borrow area, to obtain the required cover material for landfilling operations. The general location and layout of the SLS4 landfill option is shown in Figure 1.2 below.

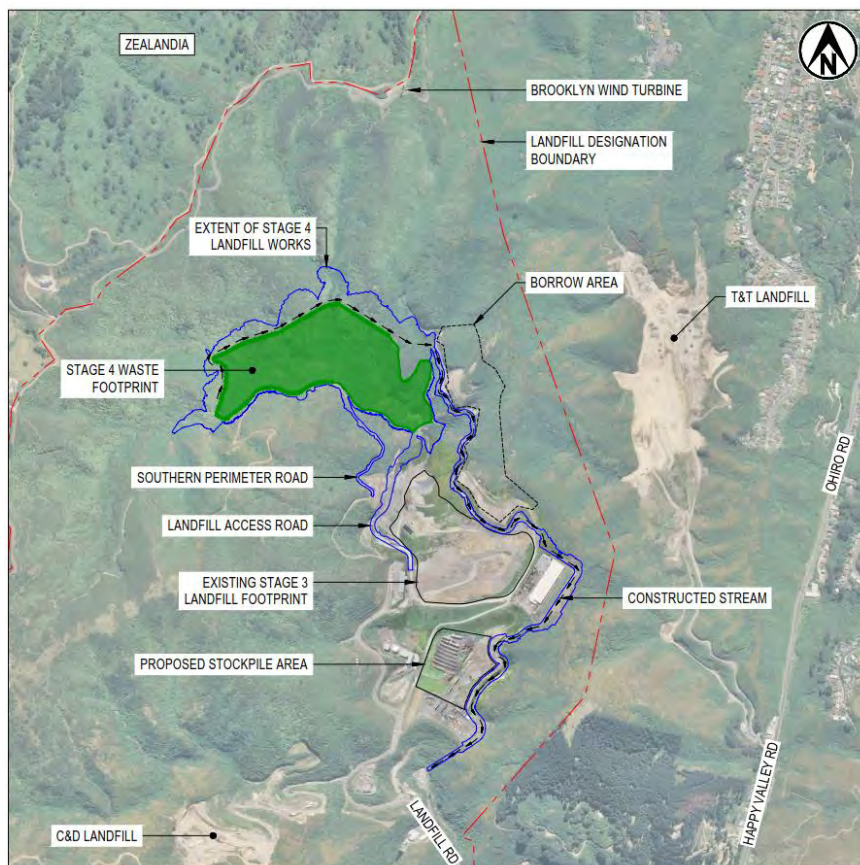


Figure 1.2: Location and layout of SLS4 option

2 High-level concept design – ‘Piggyback landfill’ option

High-level concept design sketches for the Piggyback landfill option is presented in Appendix A. The sketches developed are listed as follows:

Sketch No.	Sketch Title
85635.5000 PB SK 01	Overall Layout Plan
85635.5000 PB SK 02	Sections
85635.5000 PB SK 03	Phase 1 Cell 1-1 Development
85635.5000 PB SK 04	Phase 1 Cell 1-2 Development
85635.5000 PB SK 05	Phase 1 Cell 1-3 Development
85635.5000 PB SK 06	Phase 2 Development
85635.5000 PB SK 07	Basegrade and Drainage
85635.5000 PB SK 08	Groundwater Drainage System
85635.5000 PB SK 09	Leachate Collection System
85635.5000 PB SK 10	Landfill Lining System
85635.5000 PB SK 11	Final Cap Stormwater Drainage
85635.5000 PB SK 12	Landfill Gas Collection System

These sketches have been drawn using PDF exchange for the purposes of discussion and further development of concepts. At this high-level concept design stage, the piggyback landfill option appears to be viable. However, this high-level concept design needs to be verified following geology

and hydrogeology investigations, water quality monitoring, technical studies such as ecology, air quality, engineering analysis and calculations such as landfill stability analysis.

3 High-level budget estimate – ‘Piggyback landfill’ option

The high-level concept design provides an indicative basis for the high-level budget estimate for the construction cost of the piggyback landfill option. A breakdown of the high-level budget estimate is presented in Appendix B.

The rates utilised for this high-level budget estimate are based on a combination of WCC’s provided budget estimate, T+T’s internal costing database referring to other landfills within New Zealand and tender rates for similar projects within the regional area along with the latest available rates from QV Cost Builder database (formerly Rawlinsons). These rates are based on historic information and data and do not include allowance for any cost escalation since the date of the data other than where/as specifically stated.

Consequently, a significant margin of uncertainty exists on the high-level budget estimate and the contingency we have allowed should be considered as part of the cost rather than a potential add on.

In particular, we have not made any attempt to allow for the potential impact of COVID-19 in this high-level budget estimate. Supply chain disruptions are changing construction costs and schedules with little warning. We recommend WCC to seek up-to-date specialist economic advice on what budgetary allowances WCC should make for escalation, including for any potential changes in construction costs and timing in relation to both COVID 19, labour market impacts and supply-chain issues.

Inflation is not included in the high-level budget estimate, and the model will need to be reviewed and adjusted over time in line with relevant price indices. The high-level budget estimate provided in Appendix B is in 2021 (\$).

This high-level budget estimate is not a whole-of-life budget estimate and is only suitable for high level comparison and decision making to inform the landfill development options selection. For example operational costs, which may vary between the two options, are not considered.

4 High-level Landfill Development Program

The landfill development program for both SLS4 Option and the piggyback landfill option has been worked backwards from mid June 2026 (Southern Landfill Stage 3 consent expiry date) allowing for:

- Realistic construction duration needed for a small waste disposal area with at least 1 year landfill capacity;
- Innovative procurement strategy to purchase specialised building material from overseas that is not manufactured in NZ - time and cost saving;
- Tender administration to procure Landfill CAPEX Contractor;
- Detailed landfill design suitable for construction;
- Duration for consent processing, and
- Duration for stormwater quality monitoring, hydrogeology monitoring, freshwater ecology monitoring etc. (min. 6 months) and preparation for lodging the Assessment of Environment Effects (AEE).

The three critical project milestones for the landfill development of SLS4 and the piggyback option are:

- Date to lodge consent application for new landfill;

- Date for approval of new resource consent, and
- Date to complete construction of the first phase of the new landfill and start waste filling.

The development program for both the SLS4 and piggyback landfill option is presented in Appendix C.

Comparison and comments on the landfill development program for SLS4 and piggyback landfill option is summarised in Table 4.1.

Table 4.1: Landfill Development Program Comments

Item	Description	SLS4	Piggyback Landfill
1	Construction Duration	<p>Requires 3 construction seasons + 1 year enabling works</p> <ul style="list-style-type: none"> • Require new access road cutting into steep slopes to get to SLS4 footprint - an enabling works contract was proposed to mitigate this • Require extensive cut off drain to be connected from SLS4 footprint, past existing Stage 3 and Stage 2 and connected to Owhiro stream • Require extensive freshwater and terrestrial ecological compensation/mitigation work • Require extensive groundwater & stormwater management prior to carrying out earthworks • Require extensive earthworks to form the first cell of SLS4 that includes forming of a very large toe bund (40 m high) + 10 m high valley backfilling work • Require extensive landfill lining on steep slopes 	<p>Requires 2 construction seasons. Enabling works not required.</p> <ul style="list-style-type: none"> • Require cut off drain to be constructed on the eastern edge of Stage 3 and Stage 2 and divert clean stormwater to Owhiro stream • Require minor freshwater and terrestrial ecological compensation/mitigation work • Require groundwater & stormwater management prior to carrying out earthworks • Require earthworks to form the first cell of Piggyback that includes forming of a toe bund (5 m high) • Require landfill lining on steep slopes
2	Innovative procurement strategy	Require procuring large diameter HDPE pipes and landfill lining system from international suppliers	Require procuring landfill lining system from international suppliers. Small diameter pipes are available in NZ
3	Tender administration to procure Landfill construction Contractor	Complex and extensive work requiring more resources (machinery) and specialist skilled Contractor	Standard work - resources (machinery) and Contractor availability manageable
4	Detail landfill design suitable for construction	<p>Complex landfill design including high rock cut slopes, steep, narrow and deep valley landfill lining and stormwater management of a very large catchment area.</p> <p>Detail design for dams and stream regeneration.</p>	<p>Landfill design to account for potentially larger settlement of the existing underlying waste of the "piggyback landfill" is required.</p> <p><i>Note: Dams and stream regeneration not required</i></p>

Item	Description	SLS4	Piggyback Landfill
5	Consent complexity and duration for consent processing	<ul style="list-style-type: none"> Require innovative consenting strategy for enabling works construction season to proceed ahead of full consent application approval. Envisage a lot of submissions due to extensive impact to the environment (especially Ecology) Note: Building consents may be required for Dams 	<ul style="list-style-type: none"> Enabling works consent not required. Envisage lesser submissions compared to SLS4 option due to lesser impact to the environment (especially Ecology) Envisage shorter consent processing duration compared to SLS4 option.
6	Minimum technical baseline monitoring required to lodge resource consent such as stormwater quality monitoring, hydrogeology monitoring, freshwater ecology monitoring etc. and preparation for lodging the Assessment of Environment Effects (AEE)	<ul style="list-style-type: none"> Borehole monitoring wells have been installed - require min. 6 months monitoring data. Significant technical studies, design and reporting has been progressed - require time to pull it all together. 	<ul style="list-style-type: none"> Borehole monitoring wells have NOT been installed - require min. 6 months monitoring data. Technical studies, design and reporting has NOT started. Some technical studies carried out for SLS4 option can be repurposed for the Piggyback option.
7	Project commencement date in order for landfill to be constructed and ready to receive waste by mid June 2026	<p>July 2020</p> <p><i>Note: If SLS4 commence project work in January 2022, the projected project completion date in order for landfill to be constructed and ready to receive waste is January 2028.</i></p>	January 2022

5 Conclusions

A high-level concept design and budget estimate has been prepared for the piggyback landfill option as part of WCC's residual waste disposal review. As requested by WCC, the constructability and program delivery of this option has been compared with the previous design option, SLS4. (*Note: Concept design and budget estimate for SLS4 has been provided to WCC separately*). Although there are engineering challenges for both options, overall we consider that the 'piggyback landfill' option is the least complex with least risk from a design and construction perspective. The piggyback landfill option also requires a lesser construction cost compared to the SLS4 option. The landfill development program illustrates that the piggyback landfill option can be ready to receive waste by the current consent expiry date of June 2026 if the project progresses by January 2022, the resource consent is approved by September 2024 and construction of the piggyback landfill starts by October 2024. By contrast, it is not possible for SLS4 to be ready to receive waste by the current consent expiry date of June 2026. If the SLS4 project were to progress by January 2022, completion of SLS4 ready to receive waste is envisaged to be in January 2028, 1.5 years after the expiry date of the existing resource consent.

6 Applicability

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Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:



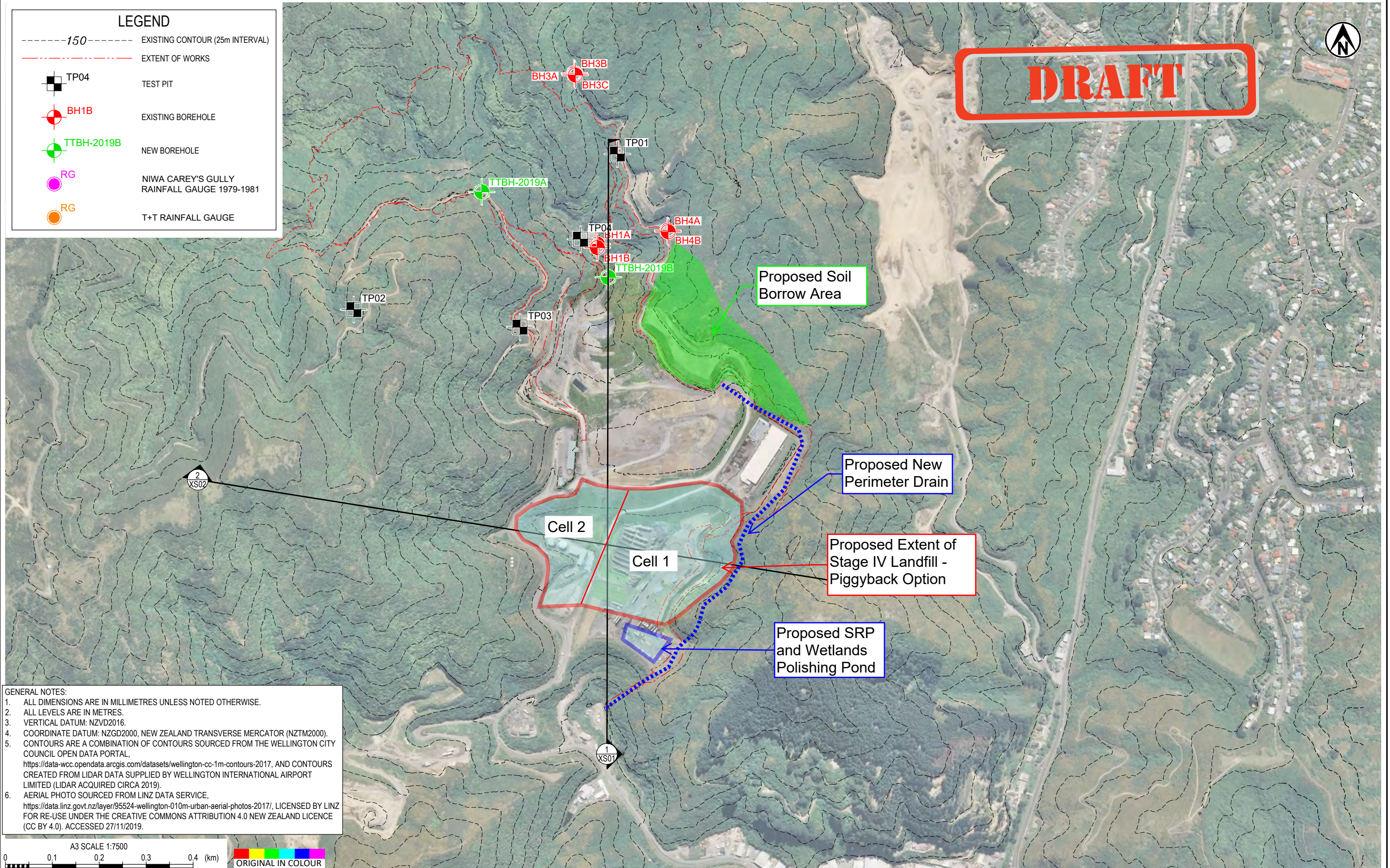
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Project Director

28-Jan-22

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Appendix A: 'Piggyback Landfill' Option: High-Level Concept Design Sketches

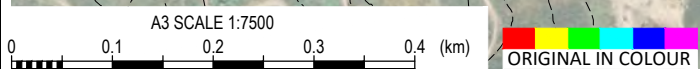


LEGEND

- EXISTING CONTOUR (25m INTERVAL)
- EXTENT OF WORKS
- TP04 TEST PIT
- BH1B EXISTING BOREHOLE
- TTBH-2019B NEW BOREHOLE
- RG NIWA CAREY'S GULLY RAINFALL GAUGE 1979-1981
- RG T+T RAINFALL GAUGE

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES.
3. VERTICAL DATUM: NZVD2016.
4. COORDINATE DATUM: NZGD2000, NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
5. CONTOURS ARE A COMBINATION OF CONTOURS SOURCED FROM THE WELLINGTON CITY COUNCIL OPEN DATA PORTAL, <https://data-wcc.opendata.arcgis.com/datasets/wellington-cc-1m-contours-2017>, AND CONTOURS CREATED FROM LIDAR DATA SUPPLIED BY WELLINGTON INTERNATIONAL AIRPORT LIMITED (LIDAR ACQUIRED CIRCA 2019).
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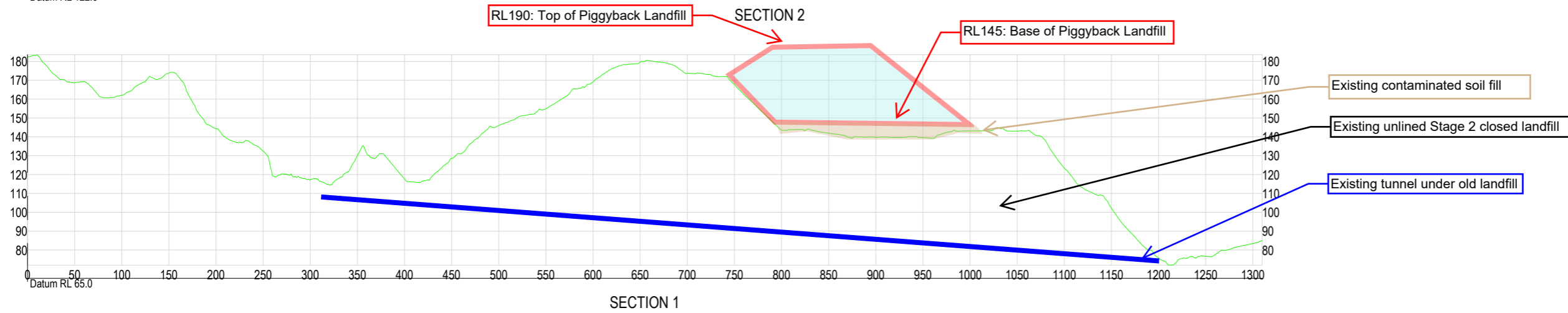
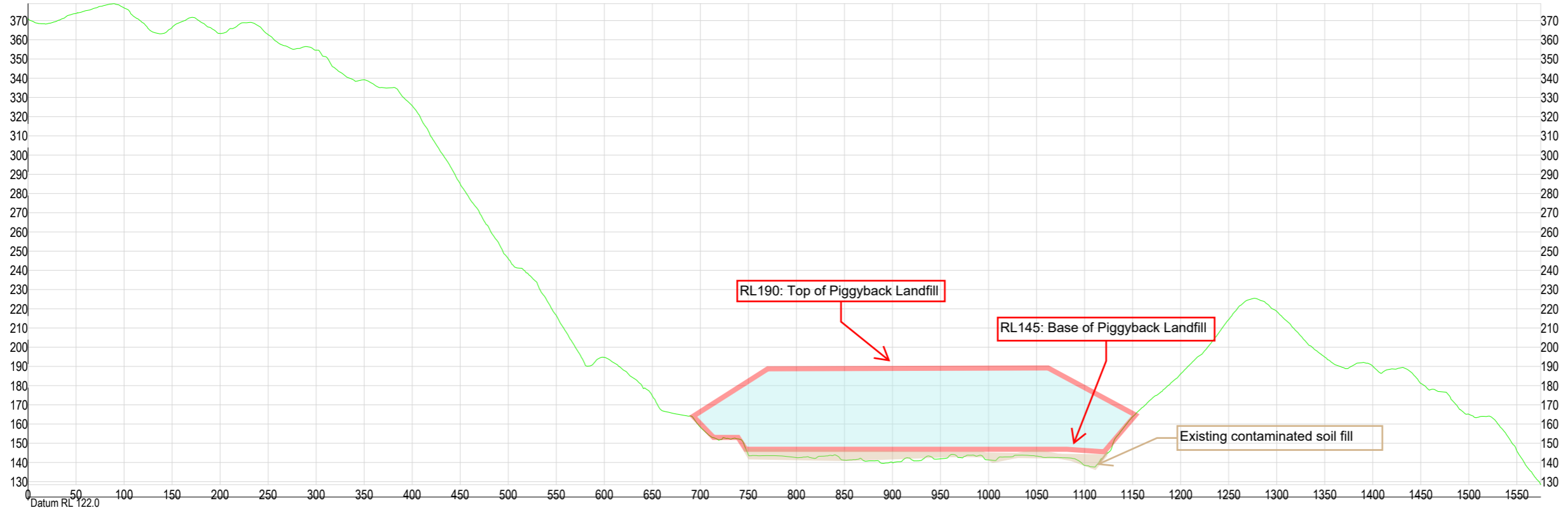
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TITLE	PIGGY-BACK OPTION OVERALL LAYOUT PLAN
SCALE (A3)	1:7500
DWG No.	85635.5000 PB SK 01
REV	1

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REV	DESCRIPTION

REVISION

DRAFT



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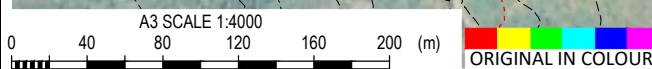
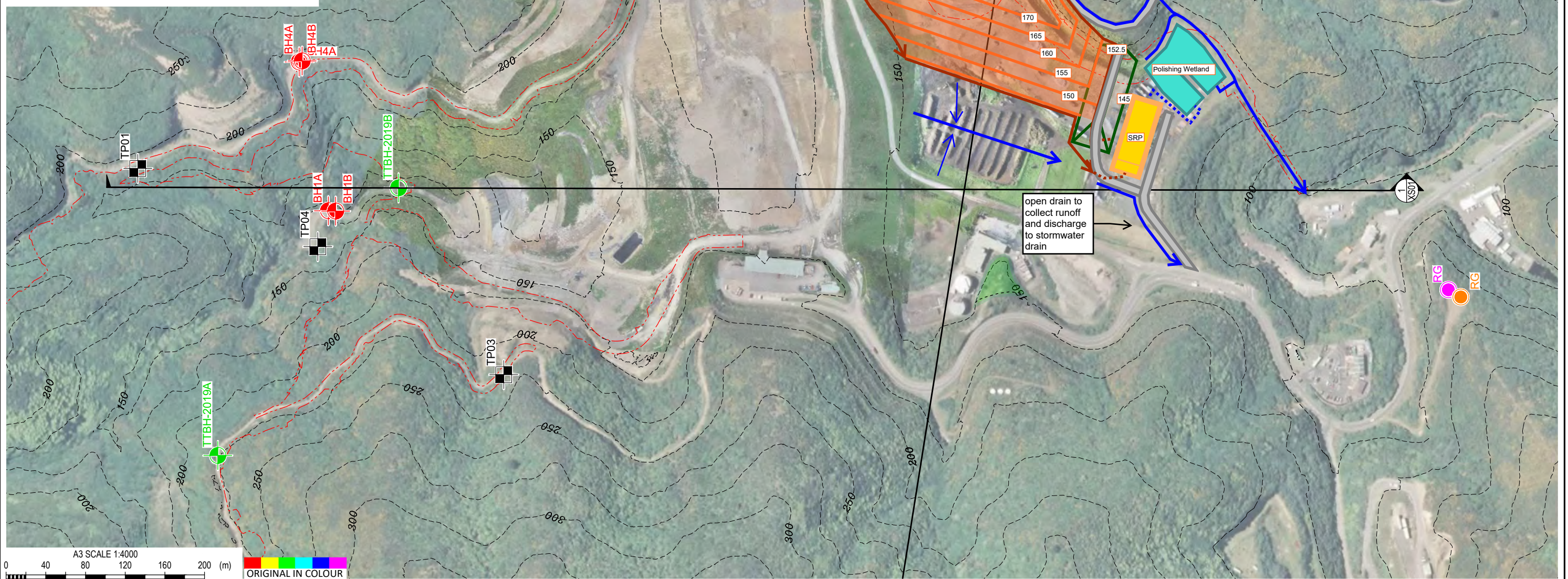
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		REV

LEGEND

- EXISTING CONTOUR (25m INTERVAL)
- EXTENT OF WORKS
- TP04 TEST PIT
- BH1B EXISTING BOREHOLE
- TTBH-2019B NEW BOREHOLE
- RG NIWA CAREY'S GULLY RAINFALL GAUGE 1979-1981
- RG T+T RAINFALL GAUGE
- Clean water
- Dirty water
- Culvert
- Access road

DRAFT

- GENERAL NOTES:**
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REV	DESCRIPTION	CAD	CHK	DATE	APPROVED	DATE

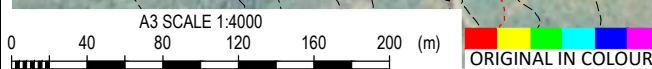
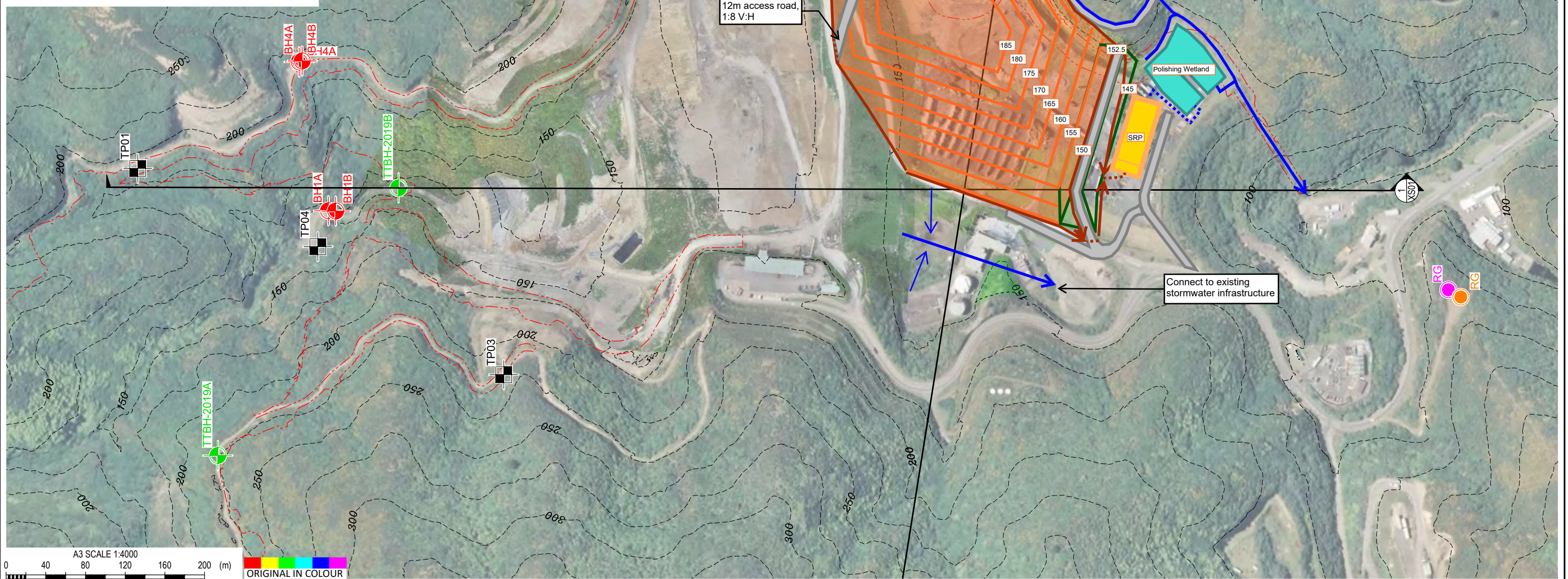
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PROJECT	SOUTHERN LANDFILL EXTENSION
TITLE	PIGGY-BACK OPTION Phase 1 Cell 1-2 Development
SCALE (A3)	1:4000
DWG No.	85635.5000 PB SK 04
REV	1

LEGEND

- EXISTING CONTOUR (25m INTERVAL)
- EXTENT OF WORKS
- TP04 TEST PIT
- BH1B EXISTING BOREHOLE
- TTBH-2019B NEW BOREHOLE
- NIWA CAREY'S GULLY RAINFALL GAUGE 1979-1981
- T+T RAINFALL GAUGE
- Clean water
- Dirty water
- Culvert
- Access road

DRAFT

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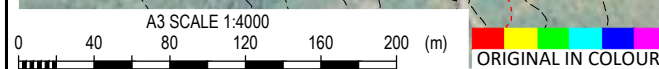
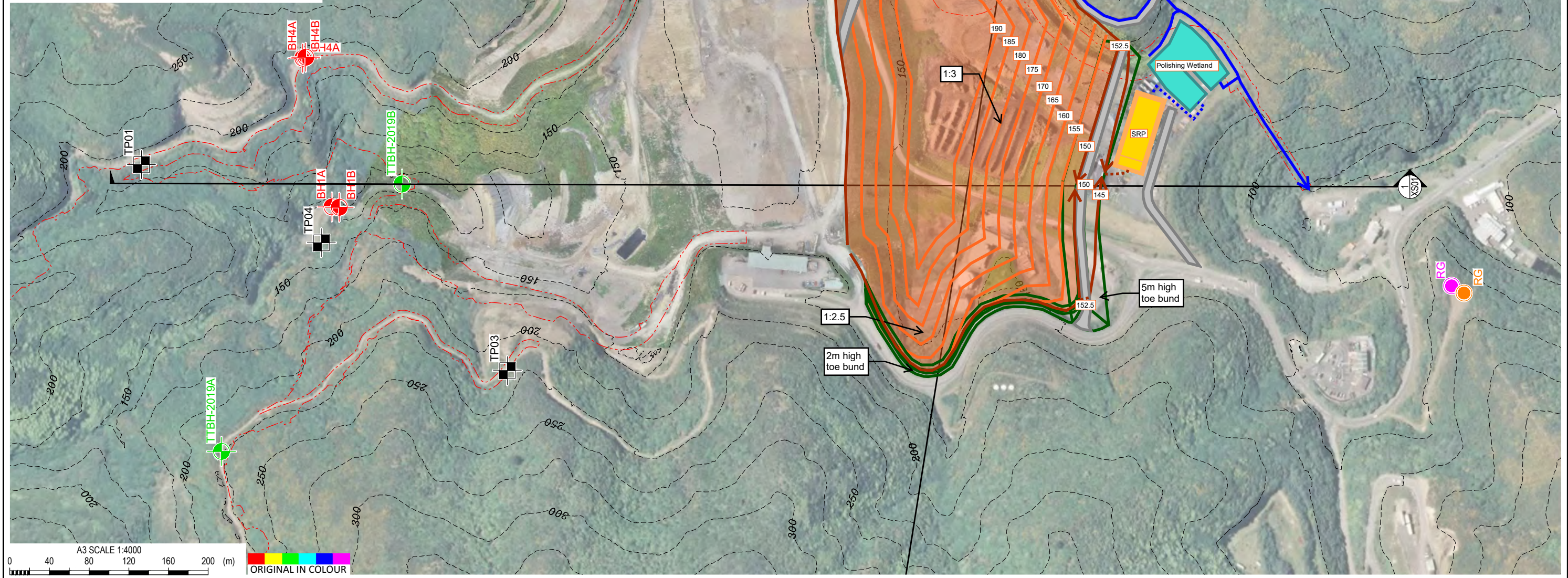
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PROJECT	SOUTHERN LANDFILL EXTENSION
TITLE	PIGGY-BACK OPTION Phase 1 Cell 1-3 Development
SCALE (A3)	1:4000
DWG No.	85635.5000 PB SK 05
REV	1

LEGEND

	150	EXISTING CONTOUR (25m INTERVAL)
		EXTENT OF WORKS
	TP04	TEST PIT
	BH1B	EXISTING BOREHOLE
	TTBH-2019B	NEW BOREHOLE
	RG	NIWA CAREY'S GULLY RAINFALL GAUGE 1979-1981
	RG	T+T RAINFALL GAUGE
		Clean water
		Dirty water
		Culvert
		Access road

DRAFT

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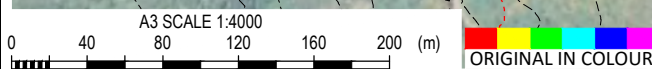
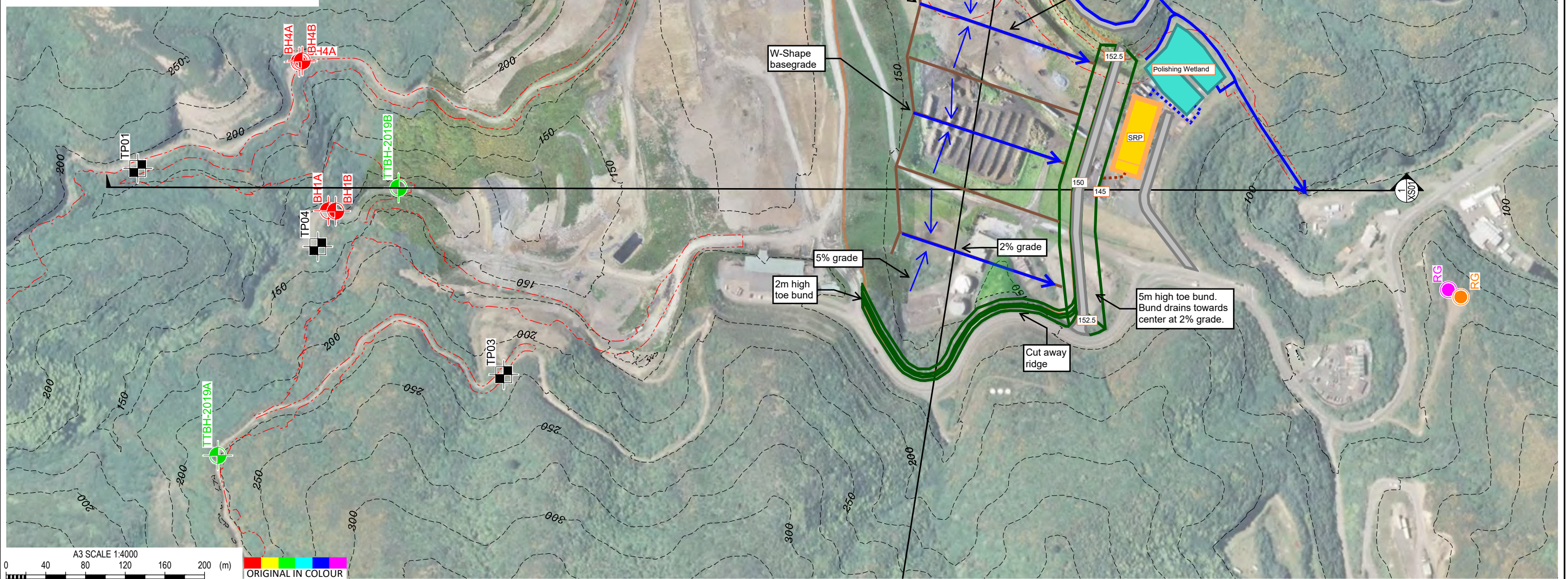
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PROJECT	SOUTHERN LANDFILL EXTENSION
TITLE	PIGGY-BACK OPTION Phase 2 Development
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DWG No.	85635.5000 PB SK 06
REV	1

LEGEND

- EXISTING CONTOUR (25m INTERVAL)
- EXTENT OF WORKS
- TP04 TEST PIT
- BH1B EXISTING BOREHOLE
- TTBH-2019B NEW BOREHOLE
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- Access road

DRAFT

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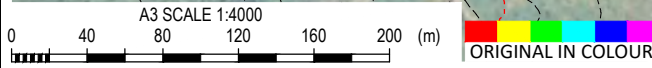
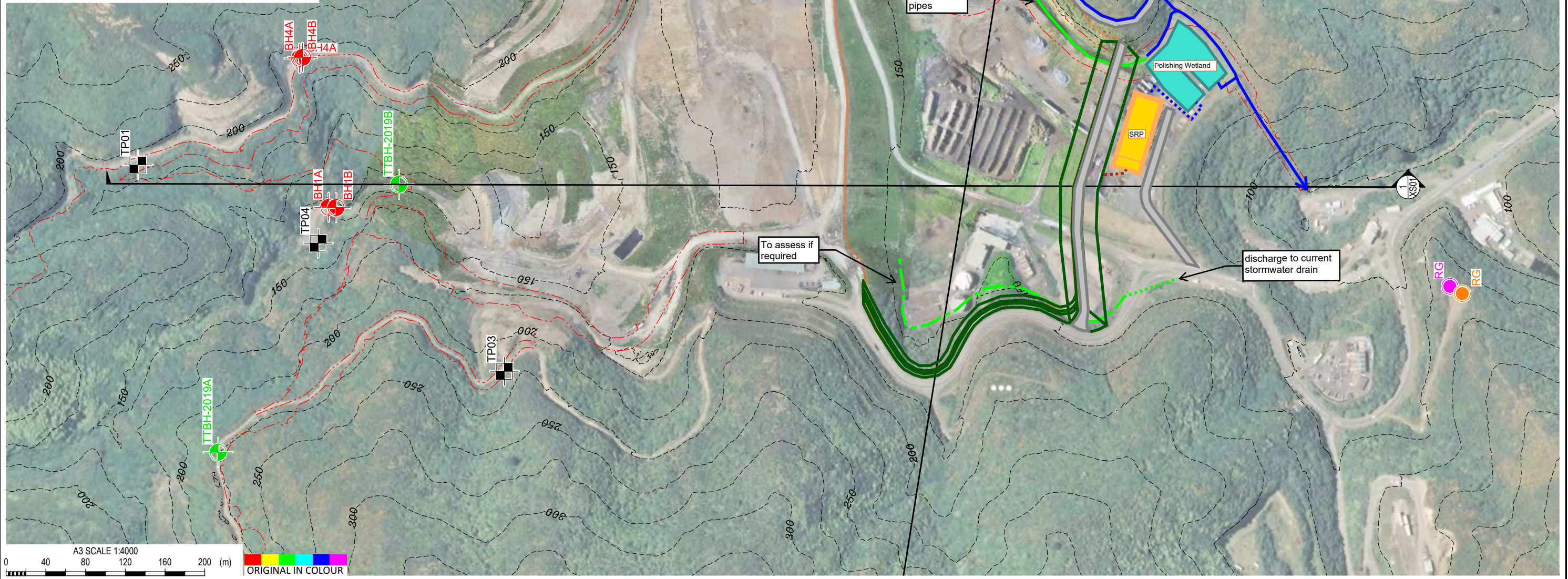
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NOT FOR CONSTRUCTION										TITLE	PIGGY-BACK OPTION			
											DEVISION			
											Basegrade and Drainage			
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LEGEND

- EXISTING CONTOUR (25m INTERVAL)
- EXTENT OF WORKS
- TP04 TEST PIT
- BH1B EXISTING BOREHOLE
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- Access road

DRAFT

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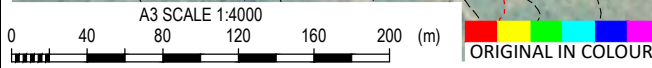
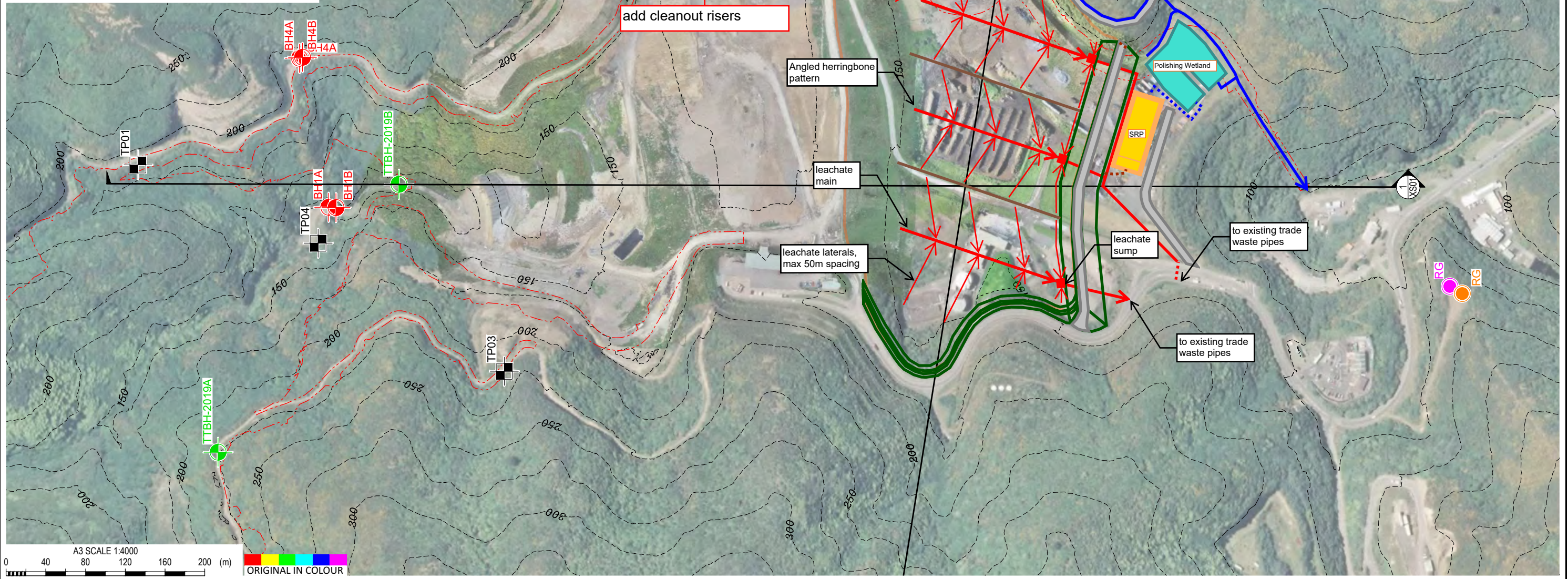
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					DESIGN CHECKED					TITLE	PIGGY-BACK OPTION			
					DRAWING CHECKED						Groundwater Drainage System			
NOT FOR CONSTRUCTION					THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED			SCALE (A3)		1:4000	DWG No.	85635.5000 PB SK 08	REV	1

LEGEND

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- EXTENT OF WORKS
- TP04 TEST PIT
- BH1B EXISTING BOREHOLE
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- RG NIWA CAREY'S GULLY RAINFALL GAUGE 1979-1981
- RG T+T RAINFALL GAUGE
- Clean water
- Dirty water
- Culvert
- Access road

DRAFT








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					DRAWING CHECKED					
					NOT FOR CONSTRUCTION				TITLE PIGGY-BACK OPTION Leachate Collection System	
					THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED				SCALE (A3) 1:4000	DWG No. 85635.5000 PB SK 09
									REV 1	


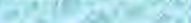







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PROJECT	SOUTHERN LANDFILL EXTENSION
TITLE	PIGGY-BACK OPTION Leachate Collection System
SCALE (A3)	1:4000
DWG No.	85635.5000 PB SK 09
REV	1

LEGEND

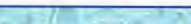




-  EXISTING CONTOUR (25m INTERVAL)
-  EXTENT OF WORKS
-  TP04 TEST PIT
-  BH1B EXISTING BOREHOLE
-  TTBH-2019B NEW BOREHOLE
-  RG NIWA CAREY'S GULLY RAINFALL GAUGE 1979-1981
-  RG T+T RAINFALL GAUGE

-  Clean water
-  Dirty water
-  Culvert
-  Access road





Type A

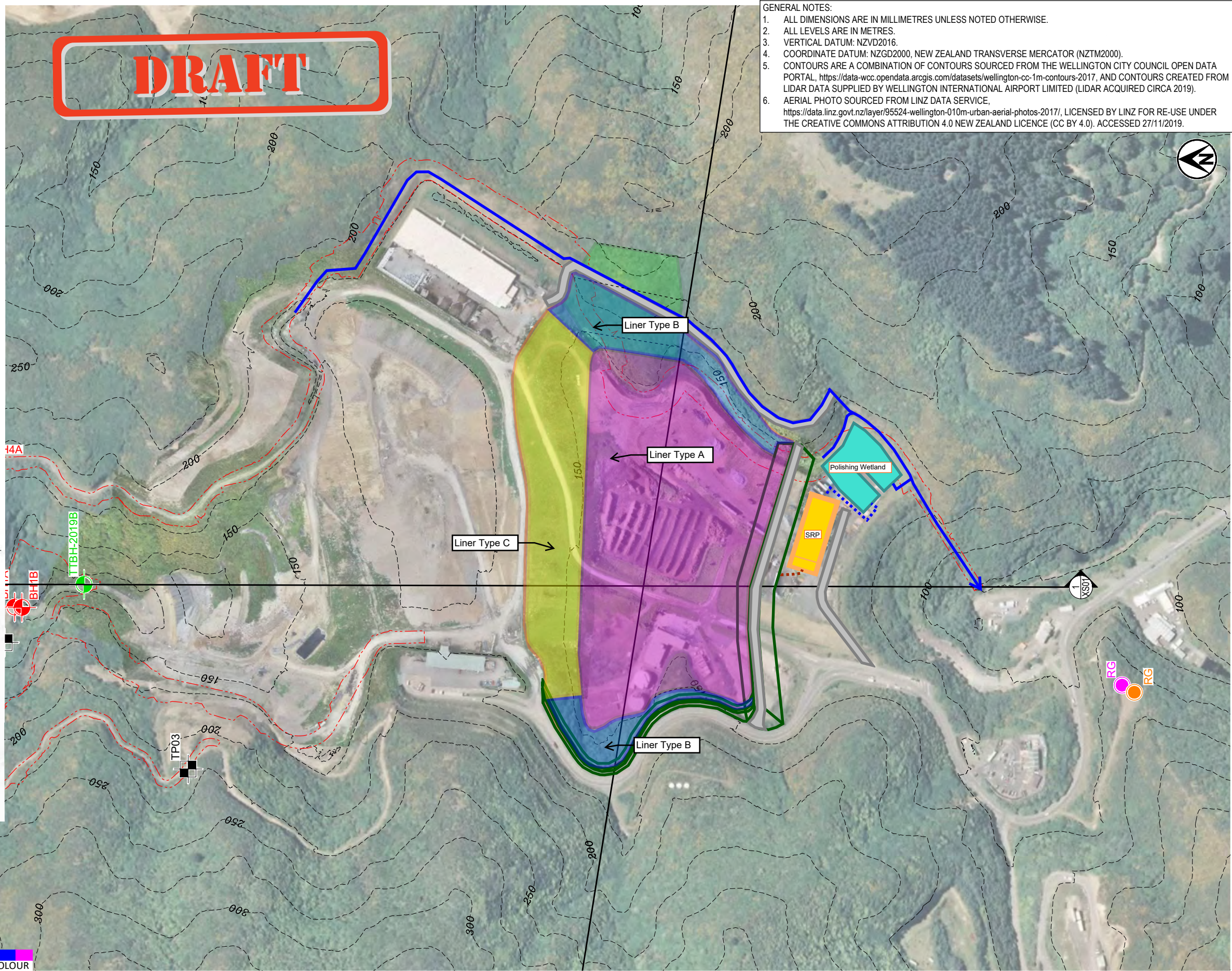
-  Geotextile filter layer
-  400mm leachate gravel
-  HDPE
-  GCL
-  600mm clay
-  Approx. 5m contaminated soil
-  Stage 2 intermediate cover
-  Stage 2 Waste
-  Waste

Type B

-  300mm leachate gravel
-  HDPE
-  GCL
-  3000mm rockfill
-  Natural ground

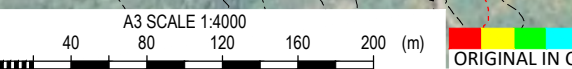
Type C

-  300mm leachate gravel
-  HDPE
-  GCL
-  Stage 3 toe bund



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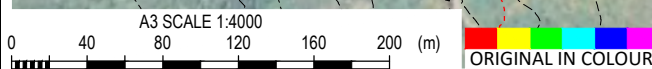
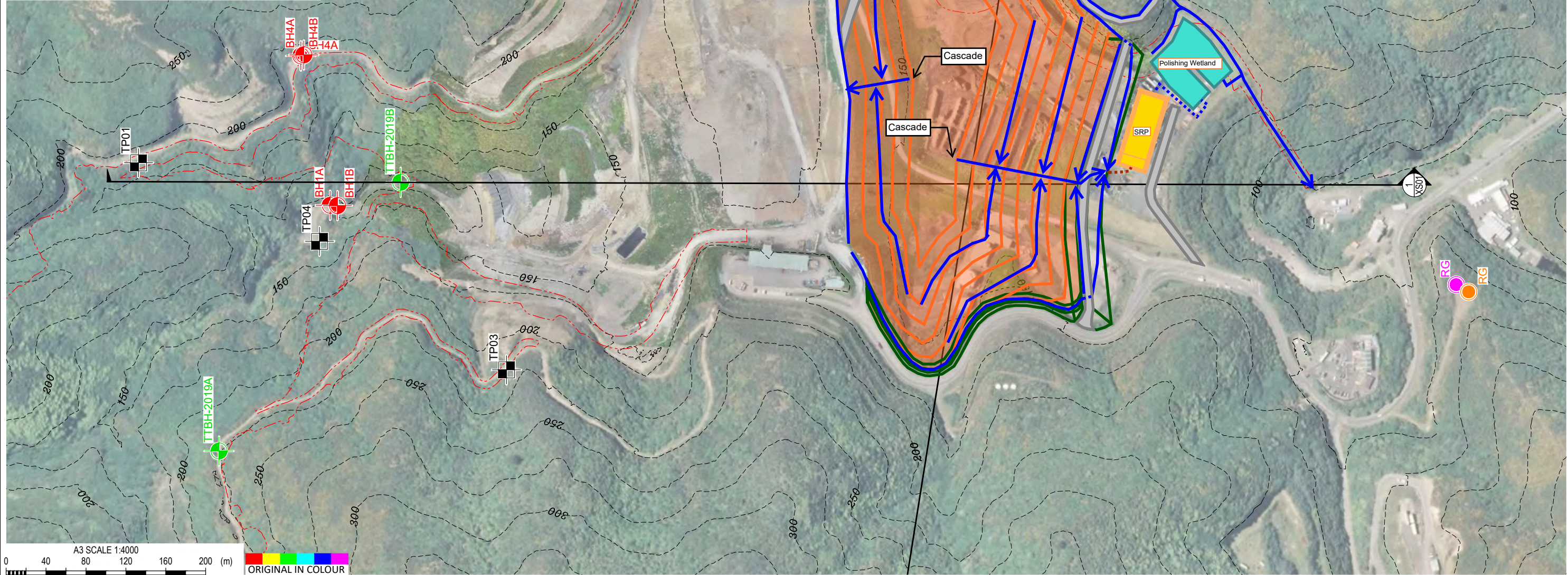
CLIENT	WELLINGTON CITY COUNCIL				
PROJECT	SOUTHERN LANDFILL EXTENSION				
TITLE	PIGGY-BACK OPTION Landfill Lining System				
SCALE (A3)	1:4000	DWG No.	85635.5000 PB SK 10	REV	1

LEGEND

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DRAFT

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NOT FOR CONSTRUCTION			THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED
APPROVED	DATE	DATE	

CLIENT	WELLINGTON CITY COUNCIL
PROJECT	SOUTHERN LANDFILL EXTENSION
TITLE	PIGGY-BACK OPTION Final Cap Stormwater Drainage
SCALE (A3)	1:4000
DWG No.	85635.5000 PB SK 11
REV	1

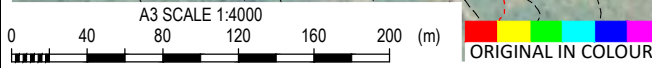
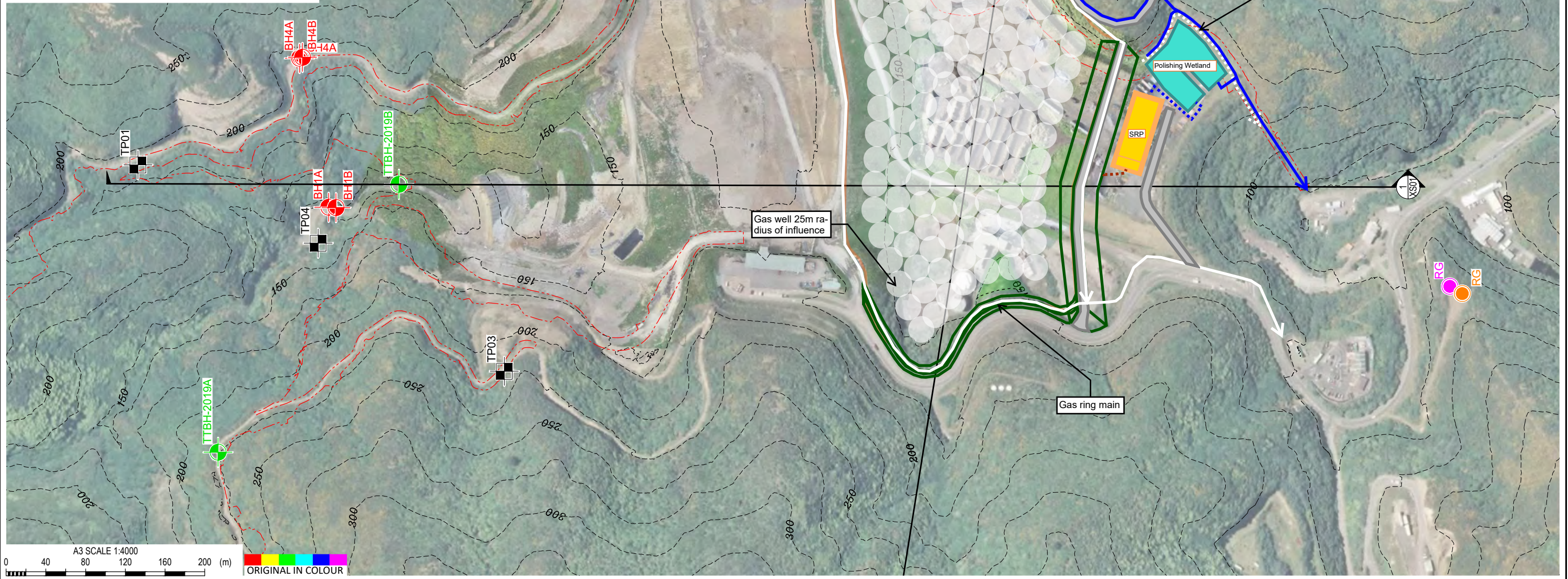
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REV	DESCRIPTION	CAD	CHK	DATE

LEGEND

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REV	DESCRIPTION	CAD	CHK	DATE	APPROVED	DATE			

CLIENT	WELLINGTON CITY COUNCIL
PROJECT	SOUTHERN LANDFILL EXTENSION
TITLE	PIGGY-BACK OPTION Landfill Gas Collection System
SCALE (A3)	1:4000
DWG No.	85635.5000 PB SK 12
REV	1

Appendix B: 'Piggyback Landfill' Option: High-Level Budget Estimate

SLS4 PIGGYBACK OPTION - HIGH LEVEL BUDGET ESTIMATE

LANDFILL ENGINEERING

Base Component		60,000	sq.m
P&G (15%)	\$	33.60	/sq.m
Piggyback landfill (GCL alone including earthworks = soil levelling layer & protection layer, herring bone leachate collection system, toe bund, 1 SRP, ESC and stormwater controls, etc.)	\$	100.00	/sq.m
+ HDPE	\$	20.00	+ HDPE
+ Liner protection	\$	12.00	+ Liner protection
+400 leachate layer	\$	30.00	+400 leachate layer
+ filter geotextile	\$	7.00	+ filter geotextile
+ 2m final cap, grassing	\$	55.00	+ 2m final cap, grassing
	\$	224.00	/sq.m
Slope Component		39,000	sq.m
P&G (15%)	\$	51.38	/sq.m
+ 3m soil cradle	\$	60.00	+ 3m soil cradle
+ Surface prep	\$	66.00	+ Surface prep/soil stabilisation (75mm shotcrete)
+ HDPE	\$	20.00	+ HDPE
+ Liner protection	\$	12.00	+ Liner protection
+ GX 40 x 40 geogrid	\$	7.00	+ GX 40 x 40 geogrid
+300 leachate layer	\$	22.50	+300 leachate layer
+ 2m final cap, grassing	\$	55.00	+ 2m final cap, grassing
	\$	393.88	/sq.m
Average (Base + slope component)	\$	290.92	/sq.m
Total (Base + slope component)	\$	28,801,125.00	

WCC MISC. COSTS

COMPOST RELOCATION	\$	300,000.00	
WEIGHBRIDGE AND NEW KIOSK	\$	500,000.00	
ECOLOGICAL COMPENSATION (Terrestrial + Freshwater)	\$	4,000,000.00	
ROADING IMPROVEMENTS	\$	500,000.00	
EXISTING SEWER IMPROVEMENTS	\$	1,000,000.00	
TUNNEL INSPECTIONS & MAINTENANCE	\$	3,500,000.00	@\$100k/yr for 35 years
Total	\$	9,800,000.00	

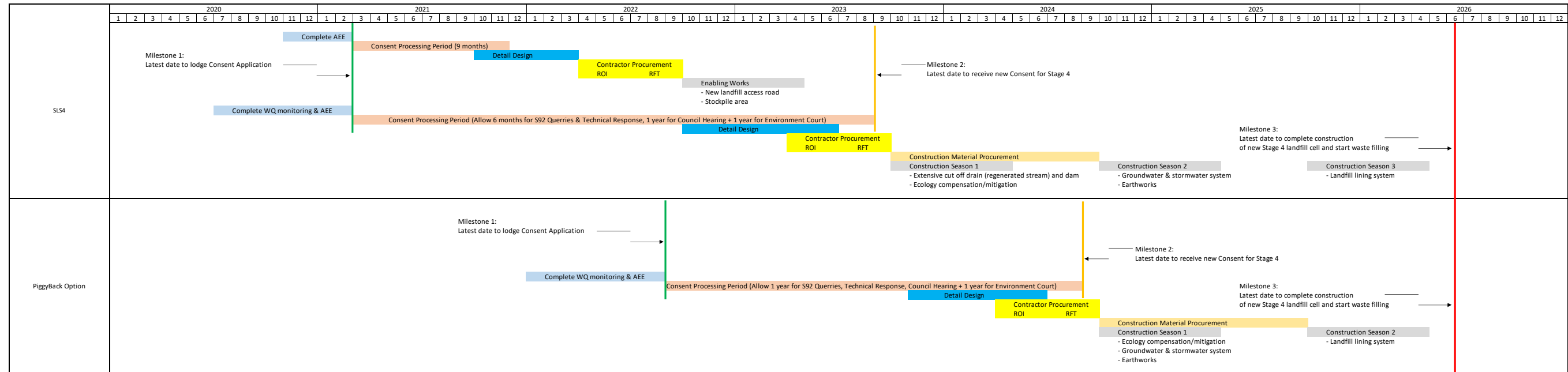
CONTINGENCIES

10%	\$	3,860,112.50	
GRAND TOTAL	\$	42,461,237.50	

ESTIMATED LANDFILL CAPACITY @ waste density 1 ton/cu.m	2,000,000	cu.m
LANDFILL CAPEX @ waste density 1 ton/cu.m	\$	21.23 /ton

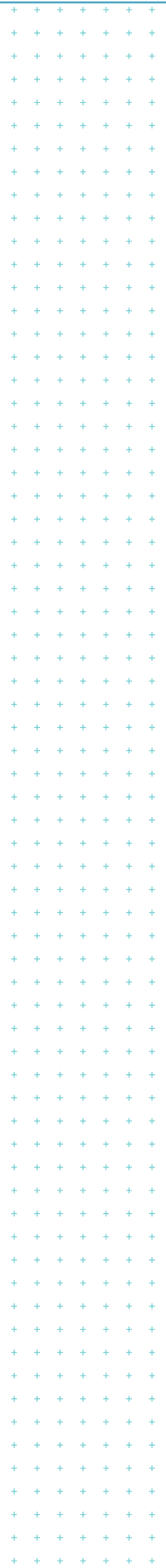
ESTIMATED LANDFILL CAPACITY @ waste density 0.8 ton/cu.m or 1.25 cu.m/ton	1,600,000	cu.m
LANDFILL CAPEX @ waste density 0.8 ton/cu.m or 1.25 cu.m/ton	\$	26.54 /ton

Appendix C: Landfill Development Program: SLS4 vs 'Piggyback landfill' Option



NOTES

- a) Program was worked backwards from Mid June 2026 (Southern Landfill Stage 3 consent expiry date) allowing for:
- Realistic construction duration needed for a small cell with at least 1 year landfill capacity
 - Innovative procurement strategy to purchase construction material that is not available in NZ - time and cost saving
 - Tender administration to procure Landfill CAPEX Contractor
 - Detail CAPEX landfill design
 - Duration for consent processing
 - Duration for Water Quality (WQ) monitoring (min. 6 months) and preparation for lodging the Assessment of Environment Effects (AEE)
- b) 3 Critical project milestones:
- Latest date to lodge consent application
 - Latest date to receive new consent for Stage 4
 - Latest date to complete construction of new Stage 4 landfill cell and start waste filling
- SLS4**
- Realistic construction duration needed for a small cell with at least 1 year landfill capacity
Require at least 3 Construction Seasons + 1 year enabling works due to:
 - Require new access road cutting into steep slopes to get to SLS4 footprint - an enabling works contract was proposed to mitigate this
 - Require extensive cut off drain to be connected from SLS4 footprint, past existing Stage 3 and Stage 2 and connected to Owhiro stream
 - Require extensive freshwater and terrestrial ecological compensation/mitigation work
 - Require extensive groundwater & stormwater management prior to carrying out earthworks
 - Require extensive earthworks to form the first cell of SLS4 that includes forming of a very large toe bund (40m high) + 10m high valley backfilling work
 - Require extensive landfill lining on steep slopes
Note: May require rock blasting activities
 - Innovative procurement strategy to purchase construction material that is not available in NZ - time and cost saving
 - Require to procure large diameter HDPE pipes and landfill lining system
 - Tender administration to procure Landfill CAPEX Contractor
 - Complex and extensive work requiring more resources (machinery) and specialist skilled Contractor
 - Detail CAPEX landfill design
 - Complex landfill design
 - Detail design for dams and stream regeneration
 - Duration for consent processing
 - Require innovative consenting strategy for enabling works construction season to proceed ahead of full consent application approval.
 - Envisage a lot of submissions due to extensive impact to the environment (especially Ecology)
Note: Building consents may be required for Dams
 - Duration for Water Quality (WQ) monitoring and preparation for lodging the Assessment of Environment Effects (AEE)
 - Borehole monitoring wells have been installed - require min. 6 months monitoring data
 - Significant technical studies, design and reporting has been progressed - require time to pull it all together
- Piggyback Option**
- Realistic construction duration needed for a small cell with at least 1 year landfill capacity
Require at least 2 Construction Seasons due to:
 - Require cut off drain to be constructed adjacent to existing Stage 3 and Stage 2 and connected to Owhiro stream
 - Require minor freshwater and terrestrial ecological compensation/mitigation work
 - Require groundwater & stormwater management prior to carrying out earthworks
 - Require earthworks to form the first cell of Piggyback that includes forming of a toe bund (5m high)
 - Require landfill lining on steep slopes
Note: Rock blasting not envisaged
 - Innovative procurement strategy to purchase construction material that is not available in NZ - time and cost saving
 - Require to procure landfill lining system
Note: Standard diameter HDPE pipes are available in NZ
 - Tender administration to procure Landfill CAPEX Contractor
 - Standard work - resources (machinery) and Contractor availability manageable
 - Detail CAPEX landfill design
 - Special considerations for piggyback landfill design is required
Note: Dams and stream regeneration not required
 - Duration for consent processing
 - Enabling works consent not required.
 - Envisage lesser submissions compared to SLS4 option due to lesser impact to the environment (especially Ecology)
 - Envisage shorter consenting duration compared to SLS4 option.
 - Duration for Water Quality (WQ) monitoring and preparation for lodging the Assessment of Environment Effects (AEE)
 - Borehole monitoring wells have NOT been installed - require min. 6 months monitoring data
 - Technical studies, design and reporting has NOT started. Some technical studies carried out for SLS4 option can be repurposed for the Piggyback option.



Appendix 6: Advantages & Disadvantages of the Short-listed Residual Waste Disposal Options

The following tables outline the primary advantages and disadvantages of the short list of Residual Waste Disposal Options.

Option 1: Southern Landfill Redevelopment (Piggyback) Option

Advantages	Disadvantages
<p>The consenting risks are well understood for this option, and therefore in contrast to the waste to energy option, there will be less risk to getting the disposal facility operational by existing consent expiry date.</p>	<p>Carbon emissions for the Piggyback landfill will vary relative to the amount of organic waste content, and the gas recapture and destruction systems in place. It is generally anticipated to be lower than the current landfill as the gas capture infrastructure can be incorporated into design and built structure of the landfill, as opposed to being retrofitted.</p>
<p>This waste disposal option is scalable, meaning that landfill filling rates can be adjusted depending on waste volumes.</p> <p>This option will not be a barrier to future waste minimisation activities or the circular economy concept.</p>	<p>Will involve adverse effects on the local environment, including:</p> <ul style="list-style-type: none"> - Reclamation of a man-made swale drain that was established as part of the closure of the previous stage of the landfill. - Removal of native vegetation. - Disposal of waste to land. - Discharge to water - Discharge to air. <p>It is noted these effects are smaller in scale than Stage 4 landfill extension option.</p>
<p>No change in current service levels for the community and industry, allowing for the disposal of asbestos and contaminated soils.</p>	<p>The current level of adverse effects on the local community will remain, including:</p> <ul style="list-style-type: none"> - High traffic volumes through Happy Valley Road. - Windblown litter - Odour issues - Stream water quality concerns.
<p>No change to current security of supply and resilience concerns as Wellington can prioritise its own waste both during normal operating environment and a civil defence emergency.</p>	<p>Potentially perceived as low tech and less progressive as an option.</p> <p>Also requires after care responsibilities once landfill is closed.</p>
<p>In comparison to a waste to energy solution, a Piggyback landfill redevelopment involves less capital expenditure to construct.</p>	<p>Estimated CAPEX costs - \$42.5 million OPEX - \$4 million (funded through landfill profits).</p>

Advantages	Disadvantages
<p>Operational costs of the landfill can also be funded through landfill revenue.</p> <p>Landfill profit for 2020/21 was \$1.5million.</p> <p>Of the three shortlisted options, this option is the least likely to require rates funding to maintain current Council waste management and minimisation services.</p>	<p>In 2020, the carbon liabilities cost approximately \$1.5 – \$2million.</p> <p>For context, the landfill currently contributes approximately 64% of the Council’s corporate emissions, and carbon liability costs are expected to increase over time.</p>

Option 2: **Landfill Closure and the Export of Waste**

Advantages	Disadvantages
<p>This option is scalable, meaning that the volume of waste exported can be adjusted to varying levels.</p> <p>It will not be a barrier to future waste minimisation or circular economy.</p>	<p>Loss of ability to directly influence waste diversion at the disposal site.</p>
<p>It is noted that without direct control of the disposal facility, the Council will have limited influence to improve carbon capture infrastructure at the receiving facility.</p> <p>There will be a slight increase in carbon emissions due to transport of waste from Wellington to the final disposal location.</p>	<p>Potential for a community perception that Wellington is simply exporting its waste and environmental problems elsewhere.</p>
<p>No adverse effects on the local environment.</p> <p>It is noted that all adverse effects will be exported to the local area of the final disposal location.</p>	<p>Security of supply and Resilience concerns – other TAs could prioritise capacity for their own waste over Wellingtons both during business-as-usual times or during a civil defence emergency.</p>
<p>Overall, less adverse local community effects.</p> <p>It is noted that vehicles would continue to travel to the Landfill Road area to dispose material at neighbouring disposal facilities.</p>	<p>Absence of landfill revenue would result in the need to secure alternative funding to continue the existing level of waste-related servicing.</p> <p>Preliminary estimates suggest that maintaining the same level of service for kerbside recycling collection and providing the same level of resourcing to support existing waste minimisation initiatives could equate to a 3.8% increase in rates.</p>
<p>No capital investment or after care responsibilities.</p>	
<p>The closure of the landfill would immediately remove the cost of ETS liabilities from the Council and shift the responsibility for carbon liabilities to the entity receiving the waste.</p>	<p>Will result in a loss of Council landfill revenue. Landfill revenue was \$17million per annum in 2021.</p> <p>Alternative funding will be required to support all current Council waste</p>

Advantages	Disadvantages
	<p>management and minimisation services is estimated to be \$6.7 million (per annum).</p> <p>Current Council waste management and minimisation services includes:</p> <ul style="list-style-type: none"> - Kerbside recycling services - Resource recovery centre and Tip Shop - Transfer station operations. - Green Waster Diversion and Composting operations <p>waste minimisation staff to support existing waste minimisation activities</p>

Option 3: Waste to Energy

Advantages	Disadvantages
<p>Methane emissions removed and replaced with CO₂ emissions due to the incineration process. CO₂ is considered a less potent greenhouse gas but can stay in the atmosphere for longer.</p> <p>It is noted that the Energy produced can offset energy produced by fossil fuels. In New Zealand, approximately 60% of energy is still generated from fossil fuels.</p>	<p>This option is not scalable, meaning that it won't allow for significantly variable levels of waste inputs.</p> <p>Likely requires a minimum tonnage of waste to make the facility economically viable.</p> <p>Will likely become a barrier to future waste minimisation initiatives and the circular economy concept.</p>
<p>In comparison to the landfill redevelopment (Piggyback) option, waste to energy would have less adverse effects on the local environment overall but would result in an increased discharge to air.</p>	<p>Up to 25% of waste to energy inputs, in the form of highly contaminated ash, would need to be exported to the final disposal location.</p>
<p>Minimal after care responsibilities once waste to energy plant is disestablished.</p>	<p>Adverse effects on the local community remain. Local adverse effects will include:</p> <ul style="list-style-type: none"> - High traffic volumes through Happy Valley Road - Windblown litter - Potential Odour concerns
<p>Perceived as a high-tech, more progressive option.</p>	<p>This option would result in a change in current service levels, as it does not allow for disposal of asbestos and contaminated soils.</p>
	<p>Security of supply and Resilience concerns – since very reliant on overseas supply chain and expertise for maintenance and repairs particularly during a civil defence emergency situation.</p>

Advantages	Disadvantages
	<p>Consenting a waste to energy is untested in the New Zealand context.</p> <p>The Council would likely to have to procure the plant before having clarity of whether the consent is granted to ensure operational by 2026. This investment would require a level of financial risk.</p>
	<p>Estimated CAPEX costs: \$215 million</p> <p>Estimated OPEX costs: \$10.8 million (per annum).</p>

FORWARD PROGRAMME

Kōrero taunaki

Summary of considerations

Purpose

1. This report provides the Forward Programme for the Pūroro Maherehere | Annual Plan/Long-term Committee for the next two meetings.

Strategic alignment with community wellbeing outcomes and priority areas

Aligns with the following strategies and priority areas:

- | | |
|---|---|
| <p>Strategic alignment with priority objective areas from Long-term Plan 2021–2031</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Sustainable, natural eco city <input type="checkbox"/> People friendly, compact, safe and accessible capital city <input type="checkbox"/> Innovative, inclusive and creative city <input type="checkbox"/> Dynamic and sustainable economy <input type="checkbox"/> Functioning, resilient and reliable three waters infrastructure <input type="checkbox"/> Affordable, resilient and safe place to live <input type="checkbox"/> Safe, resilient and reliable core transport infrastructure network <input type="checkbox"/> Fit-for-purpose community, creative and cultural spaces <input type="checkbox"/> Accelerating zero-carbon and waste-free transition <input type="checkbox"/> Strong partnerships with mana whenua |
|---|---|

Relevant Previous decisions

Not applicable.

Financial considerations

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> Nil | <input type="checkbox"/> Budgetary provision in Annual Plan / Long-term Plan | <input type="checkbox"/> Unbudgeted \$X |
|---|--|---|

Risk

- | | | | |
|---|---------------------------------|-------------------------------|----------------------------------|
| <input checked="" type="checkbox"/> Low | <input type="checkbox"/> Medium | <input type="checkbox"/> High | <input type="checkbox"/> Extreme |
|---|---------------------------------|-------------------------------|----------------------------------|

Author	Sean Johnson, Democracy Team Leader
Authoriser	Stephen McArthur, Chief Strategy & Governance Officer

Taunakitanga

Officers' Recommendations

Officers recommend that Pūroro Maherehere | Annual Plan/Long-Term Plan Committee:

1. Receive the information.

Whakarāpopoto

Executive Summary

2. The Forward Programme sets out the reports planned for Pūroro Maherehere meetings in the next two meetings that require committee consideration.
3. The Forward Programme is a working document and is subject to change on a regular basis.

Kōrerorero

Discussion

4. Tuesday 8 March 2022
 - Draft Annual Plan / Long-term Plan amendment consultation document (Chief Strategy and Governance Officer and Chief Financial Officer)
 - Establishing an Innovation and Building Better performance fund (Chief Strategy and Governance Officer)
5. Tuesday 29 March 2022
 - Adoption of Annual Plan / Long-term Plan amendment Consultation Document (Chief Strategy and Governance Officer and Chief Financial Officer)

Attachments

Nil