

MEMORANDUM

TO: Council

MEETING DATE: 15 September 2021

TITLE: Approval of Best Practicable Option for Palmerston North Wastewater Solution

PRESENTED BY: Sarah Sinclair, Chief Infrastructure Officer and David Warburton, Chair, BPO Project Steering Group

APPROVED BY: Sarah Sinclair, Chief Infrastructure Officer

RECOMMENDATION(S) TO COUNCIL

- 1. That Council adopts as the Best Practicable Option for managing wastewater from Palmerston North for the next 50 years Option 2 with the highest practicable treatment level (Level 4) and a minimum 75% diversion of wastewater from the river when the river flow is below half median.**
 - 2. That Council commit to continuing to explore practicable options to further reduce discharge to the river over the duration of the consent.**
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1. ISSUE

- 1.1 The process to identify the Best Practicable Option (BPO) for the city's wastewater management solution for the next 35 to 50 years has reached the final step of confirming the preferred BPO.
- 1.2 The Project has followed a transparent and robust process to refine a long list of 36 options, to a short list of 11 options and then to a preferred BPO. The options considered included treatment solutions that aim to meet relevant environmental and planning standards but with varying levels of confidence in respect of achieving compliance and potential risk of adverse effects on the receiving environment. The final phase was developed to provide Council with assurance that potential risks have been considered and that the recommended BPO will provide a solution that meets a range of criteria and standards to the best level that can be achieved.
- 1.3 This report provides a summary of the final phase of option selection including the weighting of the seven separate assessments, the assessment of the options against the BPO Criteria and the final determination of the preferred BPO. The report is supported by the report and attachments provided to the Council meeting of 25th August 2021.
- 1.4 At the meeting of the 25th August 2021, Council confirmed the recommended weighting and methodology for determining the preferred BPO as presented

by the Project's Technical team. This included exclusion of options considered to have low levels of alignment and/or high potential risk for not meeting the BPO Criteria, as well as those options where there was strong opposition from iwi and stakeholder groups.

- 1.5 Based on the feedback provided by Council, a recommended BPO has been confirmed in principle subject to the further definition provided in this final recommendation report.
- 1.6 This report is provided to Council to enable Council to formally decide and confirm the selected BPO to Horizons Regional Council and so meet the requirements of Condition 23 of Resource Consent Permit 101829.

2. BACKGROUND

- 2.1 Since late 2017 Council has been working through a process to determine a recommended Best Practicable Option (BPO) for managing the city's wastewater for the next 35 to 50 years. The selection of a BPO in mid-2021 and the lodgement of an application for new resource consents by June 2022 are requirements of Council's existing resource consent (Horizons Regional Council Permit 101829).
- 2.2 Following a refinement process in 2019 an extended long list of options was reduced to a short list of 11 options (refer Table 1). Since September 2020, each of the 11 options was developed further to determine recommended treatment levels, conveyance requirements and irrigation or discharge areas as well as high-level comparative costs.

Table 1 Options Description / Reference

Options		
No.	Summary Description	Technical Description
1	100% to river	R2 (b) (Level 4 treatment)
2	77% to river / 23% to land & river	R2 (b) (75% DWF land): 760 ha. (Level 4 treatment)
3	Dual river discharges: 57% to river Totara Road / 20% to river Opiki / 23% to land & river	Dual R+L (b) (75% DWF to land): 870 ha. (Level 2 treatment, TN=35)
4	97% to land inland	L+R(a): 3760 ha. (Level 1 treatment)
5	97% to land coastal	L+R(b): 2570 ha. (Level 3 treatment, TN=10)
6	53% to land inland	L+R(d-1) 80 m ³ /s trigger: 2000 ha. (Level 2 treatment, TN=35)
7	43% to land inland	L+R(d-2) 62 m ³ /s trigger: 1640 ha. (Level 2 treatment, TN=35)
8	53% to land coastal	L+R(e-1) 80 m ³ /s trigger: 3640 ha. (Level 2

9	43% to land coastal	treatment, TN=35) L+R(e-2) 62 m ³ /s trigger: 3010 ha. (Level 2 treatment, TN=35)
10	47% to Ocean / 3% river / 50% to land and coastal	O+L: 1470 ha. (Level 1 treatment)
11	97% to Ocean / 3% to river	Ocean (Level 1 treatment)

*Percentage based on duration not volume

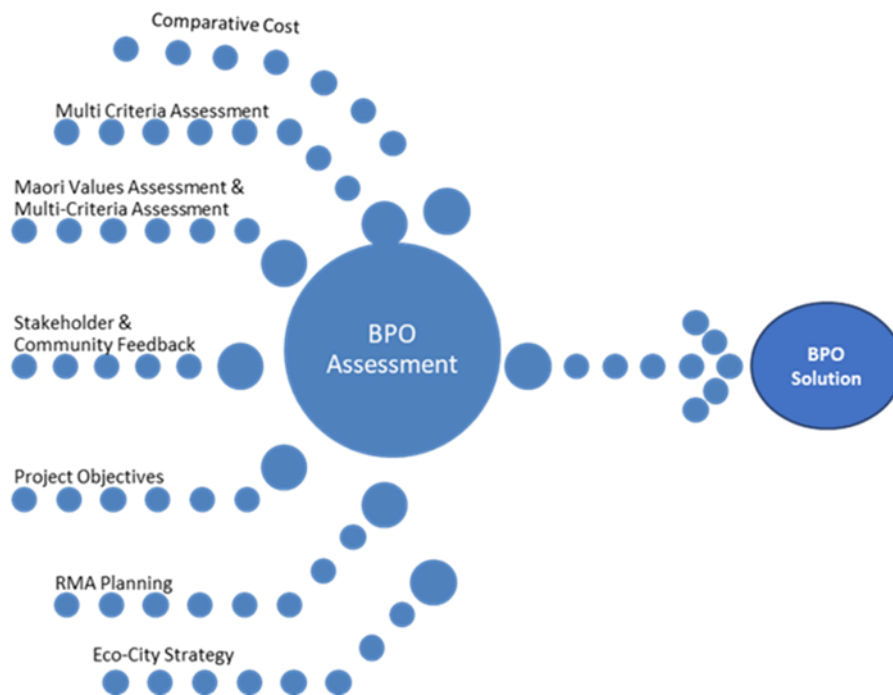
- 2.3 Rangitāne o Manawatū, as mana whenua in Palmerston North, and part of the project's steering group, as well as Council's Project Team have worked closely with Council officers and elected members at both governance and technical levels of the project. Engagement with iwi throughout the wider Manawatū Region has also occurred and significant effort has been undertaken by iwi to incorporate their values into the options assessment and selection process.
- 2.4 Community and stakeholder groups in Palmerston North and the wider Manawatū Region have been invited to provide feedback and work with Council at multiple stages of the project. This has included three rounds of community engagement between 2019 and 2021.
- 2.5 The BPO selection process has been guided by the Project Objectives set by Council at the start of the project which comprise:
1. Protects public health and minimises public health risk
 2. Minimise adverse environmental effects on air, land and water
 3. Is sustainable, enduring and resilient
 4. Contributes to improving the health and mauri of the Manawatū River
 5. Takes an integrated approach to the management of the Manawatū Catchment including understanding the cumulative effects
 6. Enhances people's use and enjoyment of the Manawatū River
 7. Is affordable and cost effective
 8. Minimises whole of life carbon emissions and optimises resource recovery
 9. Is innovative while being evidence based
 10. Facilitates long term growth and economic development
 11. Is developed with the active engagement of the community and key stakeholders

3. THE FINAL BPO SELECTION PROCESS

3.1 The final stage of the BPO selection process as depicted in Figure 1, was developed to achieve two key outcomes:

- Bring together a range of technical, social, economic and cultural considerations in a robust and transparent manner allowing for weighting of different considerations to arrive at a single preferred option
- Ensure the selected BPO met the requirements of the BPO test which is a condition of Council's current wastewater consent.

Figure 1 Final Phase BPO Assessment Process

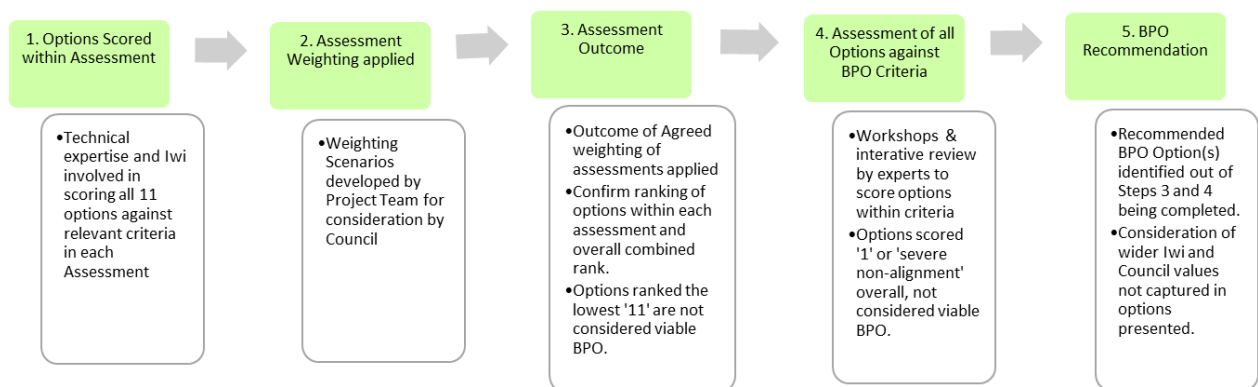


3.2 The selection process developed reflects the complexity of the BPO project while drawing on similar processes used in other complex optioneering projects. It included the following steps described below and illustrated in Figure 2 below.

- Step 1. Assessments for a range of criteria and sub-criteria scored by technical experts, iwi participants or determined from quantitative data (e.g. costs) to determine a single score and rank for each option for each assessment.

- Step 2. A relative weighting scenario developed by experts based on the assessment importance and the robustness of the data assessed. (Technical weighing was adopted by Council at the 25th of August 2021 meeting)
- Step 3. Application of the relative weighting to each of the assessments to determine a single combined score for each option and a rank order. Options ranked below 9 were flagged as not recommended for selection as the preferred BPO.
- Step 4. Scoring of each option on the basis of alignment with each of the 6 BPO criteria. Filtering of options to remove those with poor alignment with any criteria (score of 1) resulting in preferred BPO short-list in rank order.
- Step 5. Recommended BPO identified through step 3 and 4 then checked against wider Council and iwi values considerations to confirm a preferred BPO.

Figure 2 Staged Assessment Approach to Determine BPO



3.3 The seven assessments considered in Step 1 of the process comprised:

1. Comparative Cost Assessment
2. Multi-Criteria Assessment
3. Māori Values / MCA Assessment
4. Stakeholder and Community Feedback Assessment
5. Project Objectives Assessment
6. RMA Planning Assessment
7. Eco-City Strategy Assessment

3.4 Based on the process outlined, scoring of each option was undertaken for the various assessment criteria for each of the 7 assessments. These scores were then tabulated and a rank assigned to each option for each assessment. The resulting ranks in each assessment are depicted in Table 2.

Table	Option	Ranking of Option within each Assessment							Overall Ranking
		MCA	Maori	Stakeholder	Objectives	Planning	EcoCity	Comparative Cost	
	Weight scenario	Combined							
1:	R2 (b) (Level 4)	5	7	3	3	2	5	1	1
2:	R2 (b) (75% DWF land): 760 ha. (Level 4)	8	8	3	2	3	6	5	4
3:	Dual R+L (b) (75% DWF to land): 870 ha. (Level 2, TN=35)	4	9	11	6	6	11	2	10
4:	L+R(a): 3760 ha. (Level 1)	3	1	9	7	6	7	5	7
5:	L+R(b): 2570 ha. (Level 3, TN=10)	7	4	10	5	1	1	9	5
6:	L+R(d-1) 80 m3/s trigger: 2000 ha. (Level 2, TN=35)	6	2	5	10	3	9	2	5
7:	L+R(d-2) 62 m3/s trigger: 1640 ha. (Level 2, TN=35)	2	2	5	10	3	10	2	3
8:	L+R(e-1) 80 m3/s trigger: 3640 ha. (Level 2, TN=35)	10	5	5	8	9	2	9	9
9:	L+R(e-2) 62 m3/s trigger: 3010 ha. (Level 2, TN=35)	11	5	5	8	9	3	9	11
10:	O+L: 1470 ha. (Level 1)	9	10	1	4	11	4	8	8
11:	O no land (Level 1)	1	11	1	1	2	8	5	2

2 Options Rank Across 7 Assessments and Overall

3.5 All options were then assessed in respect of their alignment to 6 BPO Criteria. The BPO Criteria are specifically detailed in Council's current wastewater consent and are considered to comprise the following 6 elements:

1. Receiving Environment Sensitivity
2. Comparison of Effects on the Environment
3. Comparative Financial Implications
4. Technical Knowledge
5. Exceedance of Targets, Limits or Standards
6. RMA Part 2 and Section 104, 105 and 107 Considerations

4. TECHNICAL TEAM RECOMMENDATION

4.1 Technical Assessment Weightings

4.2 Following the five-step process outlined in section 3, the technical team determined a recommended weighting for the seven assessments, to determine a combined score for each option and a final ranking. The recommended technical weighting is depicted in Figure 3.

Figure 3 Technical Recommendation of Assessment Weightings

Octopus Arm	Proportion
Multi Criteria Assessment	15%
Maori Values & MCA	20%
Stakeholder & Community Feedback	5%
Project Objectives	25%
RMA Planning	20%
Eco-City Strategy	5%
Comparative Cost	10%

4.3 The basis for the weighting recommended by the project technical advisers is described in summary as follows:

- The highest weighting of 25% was given to Project Objectives, given these were defined at the start of the project with the purpose of defining the priority for options development and assessments. The Objectives have been the point of reference for each assessment phase at which options have been filtered. An options degree of alignment with the objectives will be a key determinate of likely success of a resource consent application.
- The RMA Planning Assessment was allocated the next highest weighting of 20% based on the critical importance of alignment between Council and Rangitāne o Manawatū in respect of agreement on an option in the spirit of true partnership and the importance of demonstrating iwi values have been meaningfully addressed through the consenting process.
- A weighting of 20% was also given to RMA planning on the basis that a BPO selection needs to ensure the risks to consenting are minimized. The RMA Planning assessment considers the broader range of planning issues which may impact on consent risk for any option.
- The MCA assessment was given a weighting of 15% reflecting acceptance that the tool is a proven approach in option selection in complex project environments which require consideration of a wide range of factors. The MCA assessment weighting is considered to have lower importance to the Maori Values and Project Objectives assessments.
- The Eco-City Strategy assessment was given a relatively low weighting largely because the BPO will have a limited impact on the city's carbon footprint and because Council has committed to prioritizing sustainability and wastewater re-use for all options.
- The Stakeholder and Community Feedback was also assigned a low weighting largely because of the low level of confidence in the robustness of the feedback, and concern that the output from the

engagements undertaken was not representative of all community and stakeholder views.

4.4 Based on these weightings a combined score and rank for the options was determined. and this is depicted in Figure 4 of this report. Alternative weightings were also proposed to provide an understanding of the sensitivity of the option ranking to weightings. The alternative weightings were worked through with Council, along with two alternative weightings proposed during the 25th August Council Meeting. Council resolved to adopt the recommended technical weighting.

4.5 **BPO Criteria Assessment**

4.6 The final stage was the assessment of each option against the 6 BPO Test Criteria, using the same 1 to 5 scoring system. The scores (with colour coding) are tabulated in Figure 4 below. These scores are linked to the option and are independent of the weighting scenarios.

4.7 To determine the recommended BPO, options with scores of 1 on any of the BPO criteria were recommended to be removed from further consideration given the low certainty of the option progressing through the consent process. This resulted in the following options being discarded:

- Option 1: 100% to river – score 1 for receiving environment sensitivity
- Option 4: 97% to land inland; 3760 ha – scores 1 for technical knowledge
- Option 5: 97% to land coastal; 2570 ha – scores 1 for comparative financial implications and technical knowledge
- Option 8: 53% to land coastal; 3640 ha – scores 1 for comparative financial implications and technical knowledge
- Option 9: 43% to land coastal, 3010 ha – scores 1 for comparative financial implications
- Option 10: 47% to Ocean / 3% river / 50% to land coastal & river – scores 1 for comparative financial implications

4.8 Figure 4 indicates (outlined in green) those options recommended to progress through to the BPO short list. Of the options not excluded, Option 3 which had ranked at 9 in the Technical Recommendation was also not recommended to proceed to final BPO consideration. The options confirmed to progress comprised:

- Option 2 (77% to river / 23% to land & river),
- Option 6 (53% to land inland) and
- Option 7 (43% to land inland)
- Option 11: 97% to ocean / 3% to river

4.9 Wider Issues Consideration

- 4.10 Following confirmation of the 4 short list BPO options the technical team then considered the wider issues to confirm which of the options should be selected as the preferred BPO. Initially, the highest ranked option in the short list was Option 11 comprising discharge to ocean, which is also a potential regional solution. Based on the consistent feedback from iwi that this option was not supported as confirmed by the options ranking at 11 in the Maori Values / MCA Assessment, the team considered that this option would be very difficult to consent and so was not recommended.
- 4.11 Option 2 was recommended for preferred BPO, on the basis that it mitigated concerns from all stakeholders around contaminant discharges by providing for the highest practicable level of treatment and allowing for beneficial diversion of treated wastewater to land when the river is most sensitive. This was also a practicable option in its likelihood of achieving consent.
- 4.12 Option 2 requires the smallest land area of all the options proposed to mitigate the impact of continuing to discharge to the river. Providing for diversion of wastewater to land when the river is below half median flow, reduces the uncertainty around irrigation of wastewater as wastewater is applied when the soils are in moisture deficit and crop water demand is greatest. Selection of this option recognises the concerns from the farming community about the negative impact of using productive agricultural land for wastewater irrigation.
- 4.13 The two remaining options in the BPO short list were Options 6 and 7. Both are split river / land options and provide for higher levels of diversion of wastewater from the river to land than under Option 2. While these options more effectively meet the aspirations for increased removal of wastewater from the river, the level of treatment provided is below that desired by many in the community. In addition, the large areas of land required are of significant concern to the farming community. For these reasons the technical team considered the options to be less preferred to Option 2.
- 4.14 Based on the assessment outlined, the Technical Team's recommendation that Option 2 be selected as the preferred BPO was accepted by Council at its 25th August meeting. In line with the commentary in the August report, Council confirmed its support for continuing to support exploring other practicable options to increase the diversion of wastewater from the river by such means as:
- beneficial re-use to replace potable water use e.g. parks and golf course irrigation and industrial re-use
 - beneficial re-use through further agricultural irrigation
 - recharge of new or degraded wetlands
- 4.15 Council also expressed support for an adaptive management approach being applied through the consent timeframe to ensure that the outcomes,

particularly the diversion of wastewater from the river, could be maximised in the face of the uncertainty around growth projections, future technological innovation and as yet unknown environmental effects.

Figure 4 Recommended BPO Ranking and BPO Criteria Scoring

Option	Rank of Octopus	BPO Scores (Mark out of 5)						BPO Score	Technical Recommendation
		Receiving environment sensitivity	Comparison of effects on the environment	Comparative financial implications	Technical Knowledge	Exceedances of standards, limits or targets	RMA Part 2 and Section 104, 105 and 107 considerations		
1: R2 (b) (Level 4)	5	1.0	3.0	5.0	4.3	2.0	2.5	17.8	5
2: R2 (b) (75% DWF land): 760 ha. (Level 4)	2	2.0	3.1	3.0	3.3	3.0	2.8	17.2	2
3: Dual R+L (b) (75% DWF to land): 870 ha. (Level 2, TN=35)	9	3.0	2.3	4.0	3.3	3.6	3.0	19.2	9
4: L+R(a): 3760 ha. (Level 1)	6	3.0	1.3	2.0	1.0	4.4	3.8	15.4	6
5: L+R(b): 2570 ha. (Level 3, TN=10)	8	3.0	2.8	1.0	1.0	4.6	3.8	16.1	8
6: L+R(d-1) 80 m3/s trigger: 2000 ha. (Level 2, TN=35)	4	3.0	2.4	3.0	2.0	4.0	3.5	17.9	4
7: L+R(d-2) 62 m3/s trigger: 1640 ha. (Level 2, TN=35)	3	3.0	2.6	4.0	2.0	4.0	3.5	19.1	3
8: L+R(e-1) 80 m3/s trigger: 3640 ha. (Level 2, TN=35)	10	3.0	2.6	1.0	1.0	4.0	2.8	14.4	10
9: L+R(e-2) 62 m3/s trigger: 3010 ha. (Level 2, TN=35)	11	3.0	2.6	1.0	1.0	4.0	2.8	14.4	11
10: O+L: 1470 ha. (Level 1)	7	4.0	2.6	1.0	1.7	4.8	3.5	17.6	7
11: O no land (Level 1)	1	5.0	3.5	2.0	3.3	5.0	3.5	22.3	1

5. RECOMMENDED BEST PRACTICABLE OPTION

5.1 The technical recommendation supported by Council and outlined by the technical team comprised two elements:

1. Acceptance of Option 2 as the preferred BPO with the highest practicable level of treatment (Treatment Level 4) and a minimum of 75% of ADWF discharged to land when the river is below half median flow,
2. Confirmation of Council support to continue exploring other practicable options to increase the diversion of wastewater from the river during the period of the consent through the adoption of an Adaptive Management Approach

5.2 BPO Solution

5.3 The baseline option comprises Option 2: R2 (b) which provides for 75% of average dry weather flows to be discharged to land when the river is below half median flow (37.5m³/s). The work undertaken to date indicates that 760 ha is the gross area of land required to achieve this.

5.4 This option has been based on very high-level information and more detailed work is required to confirm specific irrigation application rates and depths for specific soils, as well as more detailed work on modelling of river effects. The option is considered a starting point and further work will be undertaken to confirm a robust option which can meet any diversion condition with confidence. Opportunities to increase the level of diverse will be explored through the adaptive management strategy.

5.5 To enable the consent application and AEE for the preferred BPO to be prepared and lodged by June 2022 additional work to develop the detail of the option will need to be completed in the following areas:

- Staged development and implementation of the new enhanced WWTP, staged implementation of land discharge and reduction in river discharge
- Further baseline monitoring work to robustly establish the existing environment, for both the river environment and the land irrigation areas.
- Preparation of clear and strong monitoring, reporting, and auditing mechanisms to ensure timely action is taken before significant adverse effects eventuate.
- Drafting of enforceable resource consent conditions, which set clear performance requirements and criteria for each stage of project implementation

5.6 The further investigation work will assist with the completion of the AEE in the following areas:

- the extent of the environmental risk
- the importance of the activity, including how this will protect the environment.
- the degree of uncertainty; and
- the extent to which an adaptive management approach will sufficiently diminish the risk and the uncertainty described above.

5.7 **Adaptive Management Strategy**

5.8 Adaptive management is an approach used in consenting and implementation of large and complex projects, where project effects on the natural environment are required to be managed over long time periods. This requires projects to undertake long term planning for and make long term predictions of changes in demand, environmental conditions as well as receiving environment standards all of which are inherently uncertain

5.9 Adaptive management allows the consent holder flexibility to employ a range of management strategies provided the consent outcomes and effects mitigation is achieved. This can reduce the complexity of consent conditions and enable the applicant to respond in a more agile way to change.

5.10 Adaptive management is usually implemented with the support of on-going research and technical analysis from the outset of the consent being granted to increase understanding of effects of the discharges over time. The approach is supported by consent conditions focused on outcomes as well as clear reporting requirements and greater freedom to implement robust management actions.

5.11 The objective of the AMS will be to further reduce the proportion of time that treated wastewater is discharged to the Manawatū River. This could be achieved in a number of ways, which will continue to be explored.

6. **RECOMMENDATION**

6.1 It is recommended that Council:

- Adopt the recommended BPO solution to be Option 2 with the highest practicable treatment level (Level 4) and a minimum 75% diversion of wastewater from the river when the river flow is below half median, with a commitment to continue to explore practicable options to further reduce discharge to the river over the duration of the consent.

6.2 Upon adoption of the recommended BPO, the Council will confirm the BPO solution to the Horizons Regional Council in accordance with Condition 23 of Permit 101829.

6.3 Officers will advance work to develop options and recommendations to come back to Council for approval in late September or early October on:

- Options for a project governance model including terms of reference for the consent phase of the project
- Engagement of technical consultants for the next phase of the project through to lodgement of consents
- An outline project programme and plan which identifies the key tasks for the next phase of the project

7. COMPLIANCE AND ADMINISTRATION

Does the Council have delegated authority to decide? If Yes quote relevant clause(s) from Delegations Manual	Yes
Are the decisions significant?	Yes
If they are significant do they affect land or a body of water?	Yes
Can this decision only be made through a 10 Year Plan?	No
Does this decision require consultation through the Special Consultative procedure?	No
Is there funding in the current Annual Plan for these actions?	No
Are the recommendations inconsistent with any of Council's policies or plans?	No
Council has consulted on the likely impacts of the selection of the BPO through both the just completed 10 Year plan process and a separate BPO engagement process. Legal advice confirms that these processes meet the Local Government Act significance requirements.	
The recommendations contribute to Goal 4: An Eco City	
The recommendations contribute to the achievement of action/actions in Waters The actions include: <ul style="list-style-type: none"> • The Wastewater Treatment Plant is fully compliant with its existing resource consent requirements • Council has agreed to bring forward the renewal of the resource consent for the wastewater treatment plant by five years to June 2022 	
Contribution to strategic direction and to social, economic, environmental and cultural well-being	The decision on the BPO for wastewater management for the city is critical to achieving all four well beings, given it will enable application for resource consents to effectively manage wastewater for at least the next 35 years. Modern and sustainable management of wastewater is a prerequisite for Palmerston North continuing to develop in a way which effectively mitigates the negative impacts of urban development on the landscapes and local environments.

ATTACHMENTS

Nil