PAA MCDA CRITERIA – EFFECTIVELY MANAGES THE RISK OF COASTAL EROSION

Management Unit	Pathway	Pathway Description			Effectively manages coastal erosion risk	
		Short term	Medium term	Long term	Score	Notes
Management Unit 11A: Paekākāriki (Erosion Unit)	1	Status Quo[1] and Community Education and Emergency Management[4]	Sea wall[13] (Protect – Hard Engineering)	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	5	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •A further replacement seawall in the medium term is a proportionate response to the nature and scale of the hazard due to the design life of the initial replacement wall (on advice from KCDC). •A coordinated approach to managing the erosion hazard is best practise and will minimise isolated 'hot spots' of erosion in areas of coast with less resilience. •There is potential for some end effects at the northern and southern ends of the wall alignment if adjoining into the natural shoreline. This is the only reason for a potential downgrade in scoring to 4. •Re-establishment of the line will manage the risks by retreat of the most at risk property and infrastructure and giving the shoreline space to move, with a 'backstop' setback wall as the final line of defence. •The progression of options is sensible and likely to be proportionate to the scale of the hazards. Reestablishment of the line could be triggered earlier than the long term if tracking on a higher trajectory of SLR, or dependent on the design of the seawall in the medium term. •Pathways that include the 're-establish the line' option are scored more favourably because they will provide a higher level of risk reduction, and will make space on the beach.
	2	Status Quo[1] and Community Education and Emergency Management[4]	Sea wall[13] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	4	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •A further replacement seawall in the medium term is a proportionate response to the nature and scale of the hazard due to the design life of the initial replacement wall (on advice from KCDC). •A coordinated approach to managing the erosion hazard is best practise and will minimise isolated 'hot spots' of erosion in areas of coast with less resilience. •There is potential for some end effects at the northern and southern ends of the wall alignment if adjoining into the natural shoreline. This potential effect is increased by retaining an enhanced wall in the current position in the long-term, particularly at the boundary to Queen Elizabeth Park. •Enhancement of the seawall in the long term could be a viable long term option if the seawall in the medium term is designed in such a way to make this possible; however in order for the structure to provide adequate protection in its current alignment, it will likely need to take up a larger footprint that may impact other amenities/infrastructure (e.g. loss of part of the road). •This pathway scores less than the above pathway as although it will manage the risks to erosion, there is however likely to be adverse effects through design (e.g. very high wall and foundations required) and loss of amenities (e.g. loss of beach) by the seawall remaining in the same alignment as it currently is. • This is consistent with the corresponding pathway in Management Unit 10A: Raumati seawall.

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	3	Status Quo[1] and Community Education and Emergency Management[4]	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	Enhance protection structure[2] (Protect – Hard Engineering)	5	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •Re-establishment of the line in the medium term with a setback protection structure will manage the risks to erosion by retreat of most at-risk properties and infrastructure and giving the shoreline space to move. •With an appropriate setback distance, Enhancement of the setback protection structure is likely to be effective as there will be space to enable this effectively, as long as the setback seawall is appropriately designed and constructed in the medium term. •A coordinated approach alongshore to managing the risks to coastal hazards is considered to be best practise. •There is some potential for end effects to eventually occur north and south of the setback wall if the shoreline retreats back to this position over the long term, but these will be less relative to maintaining the shoreline in its present day alignment. • This is consistent with the corresponding pathway in Management Unit 10A: Raumati seawall
	4	Status Quo[1] and Community Education and Emergency Management[4]	Re-establish the line with a setback protection structure[10] and Dune reconstruction[11] (Retreat & Protect)	Beach renourishment[10] (Protect – Soft Engineering)	3	•Status quo (replacement Paekākāriki Seawall) likely to effectively manage the risks of erosion to landward infrastructure for the short term, and is proportionate to the nature and scale of risks over time. •Re-establishment of the line in the medium term with a setback protection structure will manage the risks to erosion by retreat of most at-risk properties and infrastructure and giving the shoreline space to move. •Dune reconstruction in the medium term is unlikely to effectively manage the erosion hazard by itself, but will provide some buffer in front of the setback seawall, and provide for other amenities. •There is uncertainty about maintaining the reconstructed dune in the long term under high SLR scenarios in a sediment-starved environment, and is therefore likely to result in large costs in maintaining the beach via renourishment. • Scores neutrally because the backstop wall will provide a line of defence in the medium-term, however the design is unlikely to be proportionate to the scale and nature of the hazard in the long-term, and there is uncertainty around the scale and effectiveness of renourishment required in the long-term.

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Management Unit 12A: Paekākāriki (Erosion Unit)	1	Status Quo[1] and Community Education and Emergency Management[4]	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	3	•Status Quo approach is unlikely to effectively manage the projected erosion hazard over the short term as residual life of existing structures is in some cases <10 years. Pathways with Status Quo in the short term typically score lower as the current structures do not have long residual lives. •A continued piece-meal approach to managing erosion is not best practise and may lead to exacerbating erosion hazards in unprotected areas (e.g. Ames Street Reserve). •Enhancing existing protection structures in the medium term will still result in a piecemeal approach to managing the erosion risks, which is not best practise. •Re-establishing the line with a setback protection structure over the long term will result in a coordinated approach to managing the hazard, and by retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at-risk properties and infrastructure are retreated. • Due to the long-term setback protection, the pathway scores as neutral overall. • This is consistent with the corresponding pathway in Management Unit 9A: Raumati north of Wharemauku Stream)
	2	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	Sea wall[13] (Protect – Hard Engineering)	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	4	•Enhancing existing protection structures in the short term will still result in a peiecemeal approach to managing the erosion risks, which is not best practise, however will provide a greater level of protection to areas currently protected to help manage the impacts of erosion. •A coordinated seawall approach in the medium term alligns with best practise in terms of physical works to manage the hazard. • There is potential for end-effects from the medium-term seawall, but these may be negated by the setback protection in the long-term. • Re-establishing the line with a setback protection structure over the long term will result in a coordinated approach to managing the hazard, and by retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at risk properties and infrastructure are retreated. • This is consistent with the corresponding pathway in Managemment Unit 9A: Raumati north of Wharemauku Stream)
	3	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	Enhance sea wall[2] (Protect – Hard Engineering)	5	•Enhancing existing protection structures in the short term will still result in a piecemeal approach to managing the erosion risks, which is not best practise, however will provide a greater level of protection to areas currently protected to help manage the impacts of erosion. •Re-establishing the line with a setback protection structure in the medium term will result in a coordinated approach to managing the hazard, and by retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at risk properties and infrastructure are retreated. •Enhancement of the setback protection structure over the long term is likely to be effective as there will be space to add onto the structure to provide greater elevations and volumes, as long as the setback seawall is appropriately designed and constructed in the medium term. •There is some potential for end effects to eventually occur at the ends of existing structures in the short term, and north and south of the setback wall if the shoreline retreats back to this position over the medium-long term, but these will be less relative to maintaining the shoreline in its present day alignment.

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						• This is consistent with the corresponding pathway in Management Unit 9A: Raumati north of Wharemauku Stream)
	4	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	Re-establish the line with a setback protection structure[10] (Retreat & Protect)	Beach renourishment[10] (Protect – Soft Engineering)	3	•Enhancing existing protection structures in the short term will still result in a piecemeal approach to managing the erosion risks, which is not best practise, however will provide a greater level of protection to areas currently protected to help manage the impacts of erosion. •Re-establishing the line with a setback protection structure in the medium term will result in a coordinated approach to managing the hazard, and retreating the shoreline will give the coast some space to move. The residual risk will be removed as the most at risk properties and infrastructure are retreated. •Dune reconstruction in the medium term is unlikely to effectively manage the erosion hazard by itself, but will provide some buffer in front of the setback seawall, and provide for other amenities. •There is uncertainty about maintaining the reconstructed dune in the long term under high SLR scenarios in a sediment-starved environment, and is therefore likely to result in large costs in maintaining the beach via renourishment. The backstop wall will ultimately provide a line of defence, however the scale to maintain the natural system is unlikely to be proportionate to the scale and nature of the hazard. • Scores neutrally because the backstop wall will provide a line of defence in the medium-term, however the design is unlikely to be proportionate to the scale and nature of the hazard in the long-term, and there is uncertainty around the scale and effectiveness of renourishment required in the long-term.
	5	Sea wall[13] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	3	•A coordinated approach to managing the coastal erosion hazard is best practise, and therefore constructing a new seawall in the short term will be effective in managing the erosion hazard, and is likely to be proportionate to the scale of the hazard. •Depending on the design of the short term seawall, enhancing it in the medium term to provide higher elevations and volumes for protection could be effective in managing the hazard. •Maintaining the shoreline in its current alignment out to the long term will be difficult as pressure increases with SLR. The beach in front of the wall is likely to narrow due to sediment starvation, and therefore the original design of the wall will need to account for the potential future coastal changes out to the 2130 horizon. There will likely be impacts such as end effects and beach lowering/narrowing with SLR. •This pathway scores neutrally as it is good for a coordinated protection approach to be undertaken upfront, however continuing to enhance the wall into the 100 year timeframe may be difficult and will be dependent on how it is initially designed.
	6	Status Quo[1] and Community Education and Emergency Management[4]	Enhance existing protection structure[2], Community Education and Emergency Management[4] (Enhance)	Sea wall[13] (Protect – Hard Engineering)	1	•Status Quo approach is unlikely to effectively manage the projected erosion hazard over the short term as residual life of existing structures is in some cases <10 years. •Enhancement of existing structures to provide protection over the medium term is unlikely to be sufficient in providing protection, especially in unprotected areas (e.g. Ames Street Reserve). •An uncoordinated approach to managing the erosion hazard is not best practise, and will lead to some isolated areas of erosion and end effects. •A coordinated approach over the long term by implementing a new sea wall is best practise, and would be proportional to the scale of the hazard at this timeframe.

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						•A seawall in its current alignment could result in end effects, beach lowering and narrowing as there becomes increased pressure on the shoreline with SLR. •This pathway scores low because a continuation of a piecemeal approach into the next 50 years is unfavorable and will perform poorly in managing erosion risks. A seawall in the long term will manage the risks, however having it in the same alignment as the current day will require the design to accommodate the coastal squeeze created in the short-medium term.
	7	Status Quo[1] and Community Education and Emergency Management[4]	Sea wall[13] (Protect – Hard Engineering)	Enhance Sea wall[2] (Protect – Hard Engineering)	3	•Status Quo approach is unlikely to effectively manage the projected erosion hazard over the short term as residual life of existing structures is in some cases <10 years. •A coordinated approach over the medium term by implementing a new sea wall is best practise, and would be proportional to the scale of the hazard at this timeframe. •Depending on the design of the medium term seawall, enhancing it in the long term to provide higher elevations and volumes for protection could be effective in managing the hazard. •Maintaining the shoreline in its current alignment out to the long term will be difficult as pressure increases with SLR. The beach in front of the wall is likely to narrow due to sediment starvation, and therefore the original design of the wall will need to accommodate the ability to be enhanced for the potential future coastal changes out to the 2130 horizon. There will likely be impacts such as end effects and beach lowering/narrowing with SLR.

Management Unit	Pathway	Pathway Description			Effectively manages coastal erosion risk	
		Short term	Medium term	Long term	Score	Notes
Management Unit 11B: Paekākāriki (Inundation Unit)	1	Status Quo[1] and Community Education and Emergency Management[4]	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	Additional Hard Protection (e.g. Stopbanks[13], Culverts[14], Pumpstations[15]) (Protect)	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.
	2	Status Quo[1] and Community Education and Emergency Management[4]	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	Elevate floor levels of buildings[8] or Flood proofing buildings and infrastructure[6] (Accommodate)	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.
	3	Status Quo[1] and Community Education and Emergency Management[4]	Additional Hard Protection (e.g. Stopbanks[14], Pumpstations[15]) (Protect)	Enhance Existing Inundation Protection[3] (Enhance)	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.
	4	Enhance Existing Inundation Protection[3] and Community Education and Emergency Management[4] (Enhance)	Additional Hard Protection (e.g. Stopbanks[14], Pumpstations[15]) (Protect)	Enhance Existing Inundation Protection[3] (Enhance)	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.
	5	Enhance Existing Inundation Protection$_3$ and Community Education and Emergency Management$_4$ (Enhance)	Elevate floor levels of buildings[8] or Flood proofing buildings and infrastructure[6] (Accommodate)	Additional Hard Protection (e.g. Stopbanks$_{14}$, Pumpstations[15]) (Protect)	1	•Pathway not designed to manage the risks of coastal erosion, and there are no identified co-benefits of this pathway that would additionally manage the erosion hazard.

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