26 Plummers Point West

26.1 Site description

The Plummers Point West shoreline is located on the southern side of Mangawhai Bay within Tauranga Harbour. The site consists of approximately 0.6 km of consolidated shoreline. The site is split into 5 cells based on differences in exposure and shoreline elevation (Figure 26-1). The site is relatively sheltered with an average fetch exposure of 1 km from the north.

Figure 26-1 Location and cell extent of the Plummers Point West shoreline within the Tauranga Harbour.

The western extent of the shoreline comprises well-vegetated, northwest-facing cliffs that range in elevation from RL 7 to 10 m (Cell 26A). A narrow strip of salt marsh vegetation exists along the toe of the cliffs. Towards east the shoreline elevation reduces to a low consolidated bank, ranging in elevation from RL 1 to 2 m (Cell 26B). The backshore is a grass esplanade area which gradually rises up from the bank to an elevation of RL 8 m. Further east there is another section of well-vegetated cliffs which are elevated approximately RL 8 m (Cell 26C).

The shoreline within Cell 26D is characterised by a low grass bank, which is partially protected by a timber seawall and rock rip rap. The bank is northwest-facing and ranges in elevation from RL 1 to 2 m. There is evidence of some undercutting along the unprotected sections of the bank. The grass bank continues to wrap around to a north-facing orientation with small patches of salt marsh along the toe of the bank (Cell 26E).

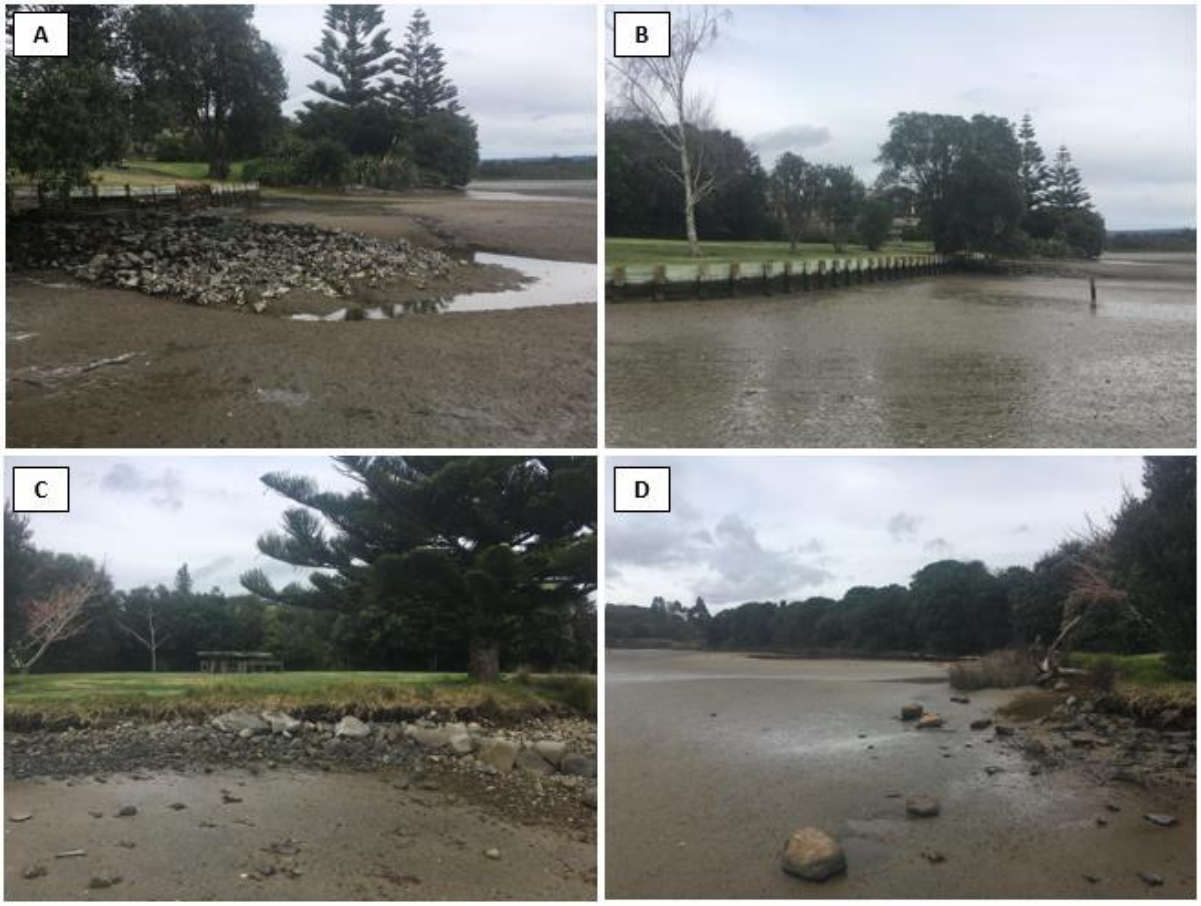


Figure 26-2 Site photos for Plummers Point West. (A) Rock around drain outfall (Cell 26D), (B) timber seawall (Cell 26D), (C) consolidated bank (Cell 26D), (D) low grass bank with patches of salt marsh (Cell 26E).

26.2 Geology

The geological map of the area[27] indicates that the site comprises:

- Matua Subgroup: Poorly to moderately sorted gravel with minor sand and silt underlying terraces; includes minor fan deposits and loess.

Field observations were in line with the published geology.

Existing slope angles for the consolidated cliffs range from 30° to 45°. The range of stable slope angles for the Plummers Point West shoreline are shown in Table 26-1 below.

The failure types observed around Plummers Point West were typically shallow surface failures. The likelihood of deep seated movement is low to moderate.

26.3 Coastal processes

Fetch exposure is relatively small along the Plummers Point West shoreline and therefore wave heights at the shoreline are likely to be relatively small. There is a tidal channel which runs close to the shoreline within Cell 26D. Based on regression analysis the grass bank within both cells 26B and 26D is retreating on average at -0.1 m/yr (Table 26-1). Due to tree coverage it is difficult to determine the long term erosion rates along the adjacent cliffs, however based on field observations

[27] Leonard, G.S.; Begg, J.G.; Wilson, C.J.N. (compilers) 2010: *Geology of the Rotorua area*. Institute of Geological & Nuclear Sciences 1:250,000 geological map 5. 1 sheet + 102 p. Lower Hutt, New Zealand. GNS Science.

the cliffs appear relatively stable with patches of salt marsh along the toe. The average erosion rates are assumed slightly less than the adjacent banks, averaging at -0.05 m/yr.

Due to the orientation of the low bank within Cell 26E, it is more sheltered compared to the rest of the site. The regression analysis shows long term erosion rates ranging from -0.02 to -0.08 m/yr.

26.4 Local considerations

There is approximately 50 m of timber seawall along the grass bank within Cell 26D (Figure 26-2B). There is also a drain outfall within Cell 26D which is surrounded with rock rip rap (Figure 26-2A).

26.5 Adopted component values

Adopted component values are presented within Table 26-1. The short term values are equal to zero for the consolidated cells as short term erosion is not applicable for consolidated shorelines (see section 4.6.2 in main report).

Table 26-1 Component values for the cells around Plummers Point West.

Site		26. Plummers Point West				
Cell		**26A**	**26B**	**26C**	**26D**	**26E**
Cell centre (NZTM)	**E**	1868157	1868252	1868266	1868331	1868436
	N	5827726	5827828	5827952	5828023	5828010
Morphology		Consolidated	Consolidated	Consolidated	Consolidated	Consolidated
Geology		Matua Subgroup	Matua Subgroup	Matua Subgroup	Matua Subgroup	Matua Subgroup
Exposure (average fetch/direction)		0.5 km (NW)	0.5 km (NW)	0.5 km (NW)	0.5 km (NW)	0.2 (N)
State		Natural	Natural	Natural	Partially protected	Natural
Short-term (m)	**Min**	0	0	0	0	0
	Mode	0	0	0	0	0
	Max	0	0	0	0	0
Dune/Cliff elevation (m above toe or scarp)	**Min**	7	1	6	1	1
	Mode	9	1.5	8	2	1.5
	Max	10	2	9	2.4	2
Stable angle (deg)	**Min**	24	24	24	24	24
	Mode	26	26	26	26	26
	Max	40	30	45	30	30
Long-term (m)	**Min**	-0.1	-0.15	-0.1	-0.15	-0.08
	Mode	-0.05	-0.1	-0.05	-0.1	-0.05
	Max	-0.02	-0.05	-0.02	-0.05	-0.02
Closure slope (beaches)/SLR response factor (cliffs)	**Min**	0.1	0.1	0.1	0.1	0.1
	Mode	0.2	0.2	0.2	0.2	0.2
	Max	0.3	0.3	0.3	0.3	0.3

26.6 Coastal erosion hazard assessment

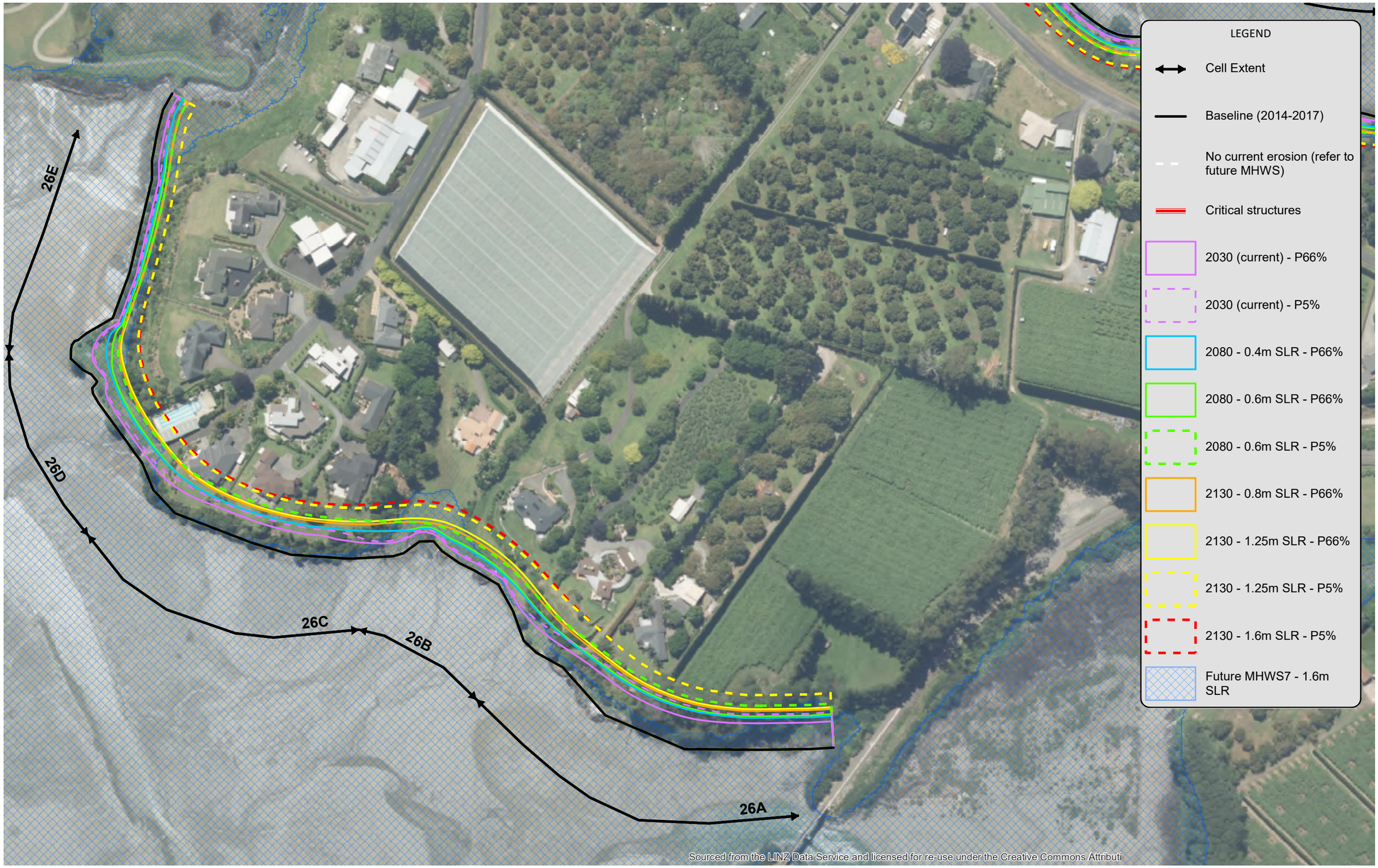
Coastal erosion hazard distances for Plummers Point West are presented within Table 26-2 and an overview map in Figure 26-4. Histograms of individual components and resultant erosion hazard distances using a Monte Carlo technique are shown in Appendix B. For the purpose of this assessment all coastal erosion protection structures have been ignored (refer to main report Section 4.5.4).

The current $P_{66\%}$ erosion hazard ranges from -4 m to -19 m along the Plummers Point West shoreline. The future $P_{5\%}$ erosion hazard for 1.6 m SLR in 2130 is up to -29 m in Cell 26C where the cliff height is largest.

Table 26-2 Coastal erosion hazard widths (m) for current, 2080 and 2130 timeframes.

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	$P_{66\%}$	$P_{50\%}$	$P_{5\%}$	$P_{1\%}$	Max
Plummers Point West	26A	Current	0.03	-9	-15	-16	-20	-21	-23
		50yr (2080)	0.12	-11	-17	-19	-23	-24	-28
			0.2	-11	-18	-19	-23	-25	-28
			0.4	-12	-18	-20	-24	-26	-29
			0.6	-12	-19	-20	-25	-26	-30
		100yr (2130)	0.22	-13	-20	-21	-27	-29	-33
			0.6	-13	-22	-23	-29	-31	-35
			0.8	-13	-22	-23	-29	-32	-36
			1.25	-13	-23	-24	-31	-33	-37
			1.6	-14	-23	-25	-31	-34	-38
	26B	Current	0.03	-3	-4	-4	-5	-6	-6
		50yr (2080)	0.12	-5	-9	-9	-12	-12	-13
			0.2	-6	-9	-10	-13	-13	-15
			0.4	-7	-10	-11	-14	-15	-17
			0.6	-7	-11	-12	-15	-16	-18
		100yr (2130)	0.22	-8	-13	-14	-18	-20	-21
			0.6	-10	-16	-17	-22	-24	-26
			0.8	-10	-16	-18	-23	-25	-28
			1.25	-10	-18	-19	-25	-27	-31
			1.6	-11	-18	-20	-27	-29	-33
	26C	Current	0.03	-7	-12	-13	-17	-19	-20
		50yr (2080)	0.12	-8	-15	-16	-21	-22	-25
			0.2	-9	-15	-16	-21	-23	-25
			0.4	-9	-16	-17	-22	-23	-27
			0.6	-9	-16	-17	-22	-24	-27
		100yr (2130)	0.22	-10	-17	-19	-24	-26	-29
			0.6	-10	-19	-20	-26	-28	-32
			0.8	-11	-19	-21	-27	-29	-33

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	$P_{66\%}$	$P_{50\%}$	$P_{5\%}$	$P_{1\%}$	Max
			1.25	-11	-20	-21	-28	-30	-35
			1.6	-11	-20	-22	-29	-31	-36
	26D	**Current**	0.03	-3	-5	-5	-6	-7	-7
		50yr (2080)	0.12	-6	-9	-10	-12	-13	-14
			0.2	-6	-10	-11	-13	-14	-15
			0.4	-7	-11	-12	-15	-16	-17
			0.6	-7	-12	-12	-16	-17	-19
		100yr (2130)	0.22	-8	-14	-15	-19	-20	-22
			0.6	-10	-16	-18	-23	-24	-26
			0.8	-10	-17	-18	-24	-26	-28
			1.25	-10	-18	-20	-26	-28	-31
			1.6	-11	-19	-21	-27	-30	-33
	26E	**Current**	0.03	-2	-4	-4	-5	-5	-5
		50yr (2080)	0.12	-3	-6	-6	-8	-8	-9
			0.2	-3	-6	-7	-8	-9	-10
			0.4	-4	-7	-7	-9	-10	-11
			0.6	-4	-7	-7	-10	-10	-12
		100yr (2130)	0.22	-4	-8	-9	-11	-12	-13
			0.6	-5	-9	-10	-13	-14	-15
			0.8	-5	-10	-10	-14	-15	-16
			1.25	-5	-10	-11	-15	-16	-18
			1.6	-6	-11	-12	-15	-17	-19



Notes: Aerial photograph sourced from the LINZ Data Service (dated 2015)

A3 SCALE 1:2,000

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Tauranga Harbour Coastal Erosion Assessment

Erosion Hazard Overview

Site 26: Plummers Point West

FIGURE No. Figure 26-4 Rev. 0

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