29 Matakana North

29.1 Site description

The Matakana North shoreline is located on the northwest side of Matakana Island. The site consists of approximately 9 km of consolidated cliff, 6 km low-lying estuarine area and 1 km of unconsolidated shoreline. The site is split into 19 cells based on differences in morphology, exposure and shoreline elevation (Figure 29-1).

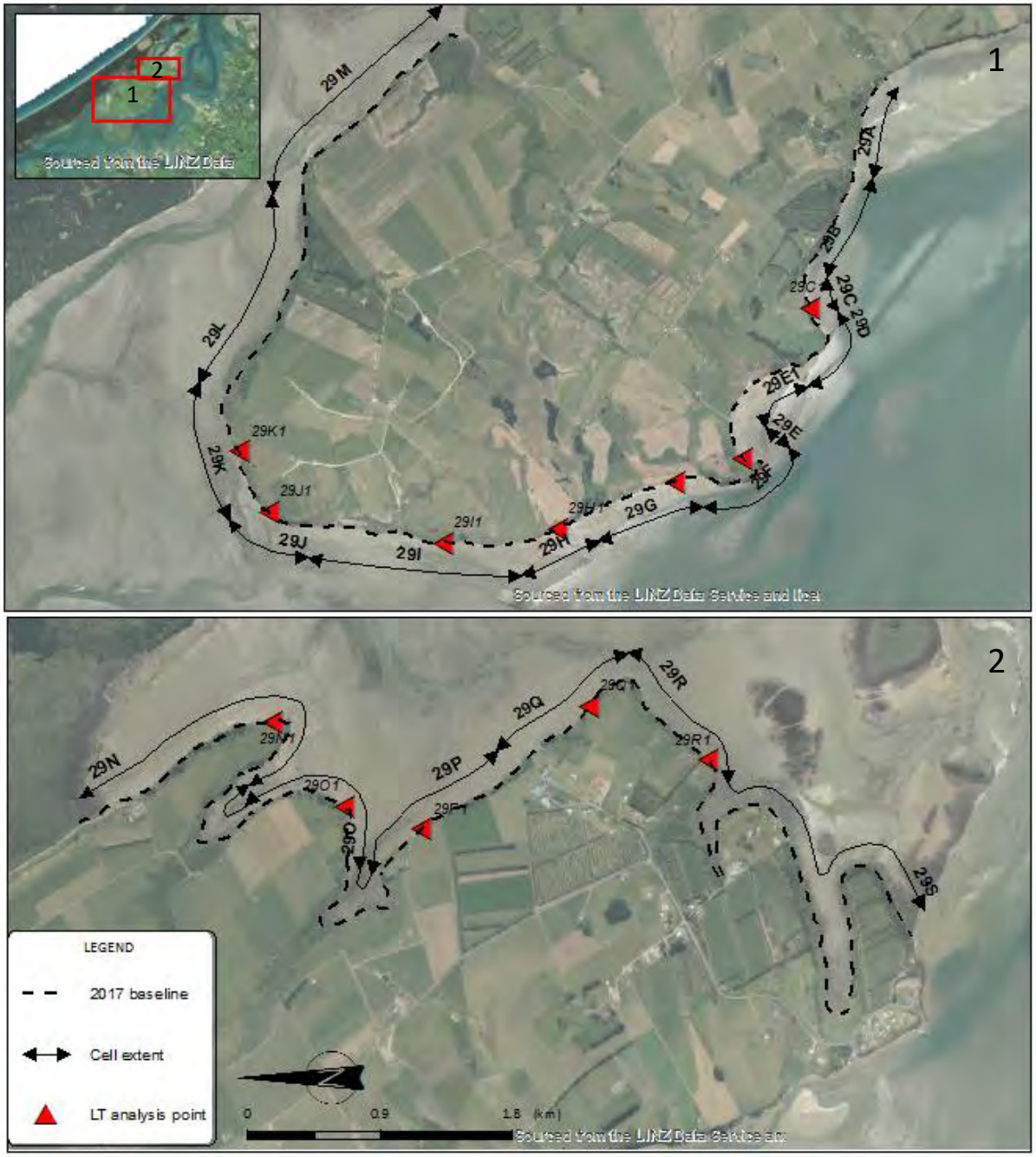


Figure 29-1 Location and extent of cells around the Matakana North shoreline within Tauranga Harbour.

Cell 29A consists of low-lying estuarine shoreline which is fronted with shallow intertidal flats and Tahunamanu Island. Towards north the shoreline rises to cliffs which range in elevation from RL 20 to 33 m (Cell 29B). The cliffs face southwest and are vegetated with large overhanging pohutukawa

trees. There is evidence of some slips occurring along the cliffs. North from the cliffs the shoreline reduces to a south-facing bank elevated approximately RL 2 m (Cell 29C). Sections of the bank are fronted with a small sandy, high-tide beach. The shoreline wraps around to southwest-facing cliffs which are elevated approximately RL 15 m (Cell 29D). The cliff toe is located close to the main tidal channel and there is evidence of slips.

Cell 29E1 is characterised by low-lying estuarine shoreline which is located within a small embayment, fronted with shallow intertidal flats. At the northern end of the embayment the shoreline rises to a low, south-facing cliff (Cell 29E). The shoreline continues to rise and wraps around to west-facing cliffs, ranging in elevation from RL 25 to 35 m (Cell 29F). The toe of the cliff is located relatively close to a main tidal channel and there are sections where large trees have fallen down the cliff face. North from the cliffs there is a section of unconsolidated shoreline with a low, grass backshore (Cell 29G).

The north-western extent of the site is characterised by northwest-facing consolidated shoreline which includes sections of cliffs (Cell 29H and 29J) and low banks (Cell 29I). The shoreline is fronted with shallow intertidal flats and patches of salt marsh vegetation.

Figure 29-2 Site photos for Matakana North. (A) Vegetated cliffs (Cell 29B). (B) Southwest-facing cliffs (Cell 29D). (C) Unconsolidated shoreline (Cell 2G) (D) consolidated cliff and banks (Cell 29H and 29I).

The southern section of Matakana (cells 29N to 29S) is a relatively sheltered environment with sections of low-lying estuarine shoreline and cliffs. Cell 29N consists of stable, east-facing cliff which is elevated approximately RL 11 m. Cell 29O consists of south-facing cliff which ranges in elevation from RL 5 to 10 m. Cells 29P and 29Q are characterised by east-facing cliffs which gradually reduce in

elevation from RL 10 m at the northern end to RL 1 m at the southern end. Cell 29R consists of relatively stable south-facing cliff which is elevated approximately RL 7 m. Cell 29S includes all of the low-lying estuarine sections where there is mangroves and salt marsh vegetation.

29.2 Geology

The geological map of the area[30] 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.
- Pakaumanu Group: Partially welded, pumice and crystal-rich ignimbrite with inverse thermal zonation: lithics of rhyolite and andesite.
- Holocene river deposits: Alluvial gravel, sand, silt, mud and clay with local peat, includes modern river beds.

The existing slope angles in this area are between 20° to 70° in areas of banks or cliffs. The range of stable slope angles for Matakana North are shown in Table 29-1 below.

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

29.3 Coastal processes

Most of the Matakana North shoreline is exposed to relatively large fetches at high tide. Along the southwest-facing side of the site (cells 29B to 29F) the water offshore is relatively deep with the tidal channel running in close proximity to the shoreline. Field observations indicate the sections of cliff are actively eroding, with slip debris being readily removed by tidal currents. Based on regression analysis within cells 29C and 29F the long term erosion rate is estimated to range from -0.1 to -0.2 m/yr. Tree coverage makes it difficult to determine the long term erosion rates along the adjacent cliffs however based on similar exposure, the range of rates are assumed to be the same within Cell 29D.

The low-lying estuarine areas within cells 29A and 29E1 are fronted with intertidal flats and are slightly more sheltered compared to the adjacent consolidated shoreline. The orientation of the sand spit around Tahunamanu Island indicates the dominant direction of sediment transport is southwards.

The northern extent of the shoreline (cells 29G to 29K) is also exposed to large fetches, however there are shallow intertidal flats fronting most of the shoreline. Based on field observations the shoreline is relatively stable indicating that any wind-wave energy is largely dissipated by the shallow intertidal flats. Due to limited aerial photographs it is difficult to measure a long term erosion rate, however based on the aerials available and comparison with sites of similar exposure, the long term erosion rates are estimated to range from -0.05 to -0.1 m/yr.

On the eastern side of the site there is minimal fetch and reduced wave exposure, therefore the sheltered environment allows for the establishment of mangroves within Cell 29L. The cliffs within Cell 29M appear relatively stable with the long term erosion rate estimated to range from -0.02 to -0.08 m/yr.

Due to the combination of large fetch exposure and deep offshore water the SLR response factors for the southwest-facing consolidated shoreline is estimated to range from 0.2 to 0.4. The range of

[30] 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.

SLR response factors are estimated to be slightly less for the northern extent, ranging from 0.1 to 0.3.

The southern extent of the Matakana North site (cells 29N to 29S) is a very sheltered environment with shallow intertidal flats and limited fetch exposure. Historic aerial photographs show very little change in the shoreline position with some small expansion of mangroves in places (Cell 29S). Based on regression analysis the long term erosion rate along the cliff cells is estimated to range from 0 to -0.05 m/yr. Due to the sheltered environment the SLR response factors are estimated to range from 0.1 to 0.3.

29.4 Adopted component values

Adopted component values are presented within Table 29-1 and Table 29-2. 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 29-1 Component values for the cells (29A to 29J) around Matakana North.

Site		29. Matakana North										
Cell		**29A**	**29B**	**29C**	**29D**	**29E1**	**29E**	**29F**	**29G**	**29H**	**29I**	**29J**
Cell centre (NZTM)	**E**	1870181	1869550	1869043	1868707	1868472	1867973	1867973	1867817	1867740	1867455	1867452
	N	5833427	5833613	5833786	5833706	5834168	5834238	5834238	5834267	5834924	5835555	5836518
Morphology		Low-lying estuarine	Consolidated	Consolidated	Consolidated	Low-lying estuarine	Consolidated	Consolidated	Unconsolidated	Consolidated	Consolidated	Consolidated
Geology		Holocene river deposits	Matua Subgroup	Matua Subgroup	Matua Subgroup	Holocene river deposits	Matua Subgroup	Matua Subgroup	Holocene river deposits	Matua Subgroup	Matua Subgroup	Matua Subgroup
Exposure (average fetch/direction)		3.5 km (S)	4 km (SW)	4 km (SE)	4.5 km (SW)	4.5 km (SW)	4 km (S)	5.5 km (W)	5.5 km (W)	5.5 km (W)	9 km (NW)	9 km (NW)
State		Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural
Short-term (m)	**Min**	*No CEHA (Refer to future MHWS layer in Stephens, 2018)*	0	0	0	*No CEHA (Refer to future MHWS layer in Stephens, 2018)*	0	0	5	0	0	0
	Mode		0	0	0		0	0	7	0	0	0
	Max		0	0	0		0	0	9	0	0	0
Dune/Cliff elevation (m above toe or scarp)	**Min**		20	1.5	13		3	25	1.5	10	1	20
	Mode		25	2	15		3.5	30	1.8	15	2	21
	Max		33	2.5	18		4	35	2	20	3	22
Stable angle (deg)	**Min**		24	24	24		24	24	30	24	24	24
	Mode		26	26	26		26	26	32	26	26	26
	Max		55	30	55		50	50	34	45	30	50
Long-term (m)	**Min**		-0.2	-0.2	-0.2		-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
	Mode		-0.15	-0.15	-0.15		-0.15	-0.15	-0.08	-0.08	-0.08	-0.08
	Max		-0.1	-0.1	-0.1		-0.1	-0.1	-0.05	-0.05	-0.05	-0.05
Closure slope (beaches)/SLR response factor (cliffs)	**Min**		0.2	0.2	0.2		0.2	0.2	0.2	0.2	0.2	0.2
	Mode		0.3	0.3	0.3		0.3	0.3	0.3	0.3	0.3	0.3
	Max		0.4	0.4	0.4		0.4	0.4	0.4	0.4	0.4	0.4

Table 29-2 Component values for the cells (29K to 29S) around Matakana North.

Site		Matakana North								
Cell		**29K**	**29L**	**29M**	**29N**	**29O**	**29P**	**29Q**	**29R**	**29S**
Cell centre (NZTM)	**E**	1868031	1868947	1870316	1872316	1872104	1872019	1872368	1872358	1871794
	N	5837672	5837377	5836782	5834292	5833882	5833477	5832969	5832625	5832112
Morphology		Consolidated	Low-lying estuarine	Consolidated	Consolidated	Consolidated	Consolidated	Consolidated	Consolidated	Low-lying estuarine
Geology		Matua Subgroup	Matua Subgroup	Matua Subgroup	Matua Subgroup	Matua Subgroup	Matua Subgroup	Matua Subgroup	Matua Subgroup	Holocene river deposits
Exposure (average fetch/direction)		9 km (NW)	1 km (NE)	0.5 km (NE)	1 km (S)	1 km (S)	1 km(NE)	1 km(NE)	1 km (SE)	
State		Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural
Short-term (m)	**Min**	0	*No CEHA (Refer to future MHWS layer in Stephens, 2018)*	0	0	0	0	0	0	*No CEHA (Refer to future MHWS layer in Stephens, 2018)*
	Mode	0		0	0	0	0	0	0	
	Max	0		0	0	0	0	0	0	
Dune/Cliff elevation (m above toe or scarp)	**Min**	1.5		9	10	5	7.5	1	7	
	Mode	2		10	11	7	8.5	1.5	7.5	
	Max	3		11	11.5	10	10	2	8	
Stable angle (deg)	**Min**	24		24	24	24	24	24	24	
	Mode	26		26	26	26	26	26	26	
	Max	30		45	45	40	40	40	40	
Long-term (m)	**Min**	-0.1		-0.08	-0.05	-0.05	-0.05	-0.05	-0.05	
	Mode	-0.08		-0.05	-0.02	-0.02	-0.02	-0.02	-0.02	
	Max	-0.05		-0.02	0	0	0	0	0	
Closure slope (beaches)/SLR response factor (cliffs)	**Min**	0.2		0.1	0.1	0.1	0.1	0.1	0.1	
	Mode	0.3		0.2	0.2	0.2	0.2	0.2	0.2	
	Max	0.4		0.3	0.3	0.3	0.3	0.3	0.3	

29.5 Coastal erosion hazard assessment

Coastal erosion hazard distances for Matakana North are presented within Table 29-3 and an overview map in Figure 29-4. 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).

Both the current and future erosion hazard is largest along the west-facing cliffs (cells 29B and 29F). The current $P_{66\%}$ ranges from -3 m along the low consolidated bank within Cell 29Q to -41 m along the cliffs within cell 29F. The $P_{5\%}$ for 1.6 m SLR in 2130, ranges from -10 m along the sheltered shoreline, to -97 m along the exposed cliffs.

Due to the sheltered environment and in some places the expansion of mangroves, there is no current erosion hazard within cells 29A, 29E, 29L and 29S. Inundation as a consequence of SLR is likely to be a greater hazard for the low-lying shoreline in the future.

Table 29-3 Coastal erosion hazard widths (m) for 2030, 2080 and 2130 timeframes.

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	$P_{66\%}$	$P_{50\%}$	$P_{5\%}$	$P_{1\%}$	Max
Matakana North	29A	Current (2030)	0.03	*No CEHA (Refer to future MHWS layer in Stephens, 2018)*					
		50yr (2080)	0.12						
			0.2						
			0.4						
			0.6						
		100yr (2130)	0.22						
			0.6						
			0.8						
			1.25						
			1.6						
	29B	Current (2030)	0.03	-18	-32	-36	-57	-64	-74
		50yr (2080)	0.12	-23	-39	-44	-65	-71	-84
			0.2	-24	-41	-46	-66	-73	-86
			0.4	-26	-43	-48	-69	-76	-89
			0.6	-27	-45	-50	-71	-78	-91
		100yr (2130)	0.22	-29	-47	-52	-72	-79	-93
			0.6	-32	-53	-58	-79	-86	-101
			0.8	-34	-55	-60	-81	-89	-103
			1.25	-36	-59	-64	-85	-93	-109
			1.6	-38	-61	-66	-88	-96	-112
	29C	Current (2030)	0.03	-4	-6	-6	-7	-8	-8
		50yr (2080)	0.12	-9	-13	-14	-16	-17	-18
			0.2	-11	-15	-15	-18	-19	-20
			0.4	-12	-17	-18	-21	-22	-25

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	$P_{66\%}$	$P_{50\%}$	$P_{5\%}$	$P_{1\%}$	Max
			0.6	-13	-19	-20	-24	-25	-28
		100yr (2130)	0.22	-15	-20	-21	-25	-26	-28
			0.6	-18	-26	-27	-33	-35	-38
			0.8	-19	-28	-29	-36	-38	-42
			1.25	-21	-31	-33	-41	-44	-48
			1.6	-22	-33	-35	-44	-47	-53
	29D	Current (2030)	0.03	-11	-20	-23	-34	-37	-41
		50yr (2080)	0.12	-18	-27	-30	-42	-45	-48
			0.2	-19	-29	-32	-43	-46	-51
			0.4	-21	-31	-34	-46	-49	-54
			0.6	-22	-33	-36	-48	-52	-57
		100yr (2130)	0.22	-24	-35	-38	-50	-53	-58
			0.6	-27	-41	-44	-57	-61	-67
			0.8	-28	-43	-46	-59	-63	-70
			1.25	-30	-47	-50	-63	-68	-77
			1.6	-32	-49	-52	-66	-71	-81
	29E1	Current (2030)	0.03	*No CEHA (Refer to future MHWS layer in Stephens, 2018)*					
		50yr (2080)	0.12						
			0.2						
			0.4						
			0.6						
		100yr (2130)	0.22						
			0.6						
			0.8						
			1.25						
			1.6						
	29E	Current (2030)	0.03	-4	-7	-7	-10	-10	-11
		50yr (2080)	0.12	-10	-14	-15	-18	-19	-21
			0.2	-11	-16	-16	-20	-21	-23
			0.4	-12	-18	-19	-23	-25	-28
			0.6	-13	-20	-21	-25	-27	-31
		100yr (2130)	0.22	-15	-21	-23	-27	-29	-31
			0.6	-18	-27	-29	-35	-37	-40
			0.8	-19	-29	-31	-38	-40	-43
			1.25	-21	-32	-34	-43	-46	-50
			1.6	-22	-34	-37	-46	-50	-54
	29F	Current (2030)	0.03	-24	-41	-46	-66	-71	-78
			0.12	-29	-49	-54	-73	-78	-85

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	$P_{66\%}$	$P_{50\%}$	$P_{5\%}$	$P_{1\%}$	Max
		50yr (2080)	0.2	-30	-50	-55	-75	-80	-87
			0.4	-32	-53	-58	-77	-83	-91
			0.6	-33	-55	-60	-79	-85	-94
		100yr (2130)	0.22	-35	-56	-62	-81	-86	-95
			0.6	-39	-62	-68	-88	-93	-104
			0.8	-40	-65	-70	-90	-96	-108
			1.25	-42	-68	-74	-94	-101	-114
			1.6	-44	-70	-76	-97	-103	-117
	29G	Current (2030)	0.03	-7	-9	-10	-11	-11	-12
		50yr (2080)	0.12	-10	-13	-13	-15	-16	-17
			0.2	-10	-13	-14	-15	-16	-17
			0.4	-11	-14	-14	-16	-17	-18
			0.6	-11	-15	-15	-17	-17	-18
		100yr (2130)	0.22	-13	-17	-17	-20	-20	-21
			0.6	-14	-18	-19	-21	-22	-23
			0.8	-14	-19	-19	-22	-22	-24
			1.25	-16	-20	-21	-23	-24	-26
			1.6	-17	-21	-22	-25	-26	-28
	29H	Current (2030)	0.03	-12	-22	-25	-35	-39	-45
		50yr (2080)	0.12	-15	-26	-29	-39	-43	-49
			0.2	-16	-27	-30	-40	-44	-50
			0.4	-17	-28	-31	-41	-45	-52
			0.6	-17	-29	-32	-42	-46	-54
		100yr (2130)	0.22	-18	-30	-33	-43	-47	-54
			0.6	-20	-33	-36	-46	-51	-58
			0.8	-21	-34	-37	-47	-52	-60
			1.25	-22	-36	-39	-50	-54	-63
			1.6	-23	-37	-40	-51	-55	-64
	29I	Current (2030)	0.03	-3	-5	-5	-7	-7	-8
		50yr (2080)	0.12	-5	-8	-9	-11	-11	-12
			0.2	-6	-9	-10	-12	-12	-13
			0.4	-7	-11	-11	-13	-14	-15
			0.6	-8	-11	-12	-14	-15	-17
		100yr (2130)	0.22	-8	-12	-13	-15	-16	-17
			0.6	-10	-15	-16	-19	-20	-22
			0.8	-11	-16	-17	-20	-22	-23
			1.25	-12	-18	-19	-23	-24	-26
			1.6	-13	-19	-20	-25	-26	-29
	29J	Current (2030)	0.03	-18	-28	-32	-44	-47	-50

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	$P_{66\%}$	$P_{50\%}$	$P_{5\%}$	$P_{1\%}$	Max
		50yr (2080)	0.12	-22	-32	-36	-48	-51	-54
			0.2	-22	-33	-37	-49	-51	-54
			0.4	-23	-34	-38	-51	-53	-56
			0.6	-24	-35	-39	-52	-54	-58
		100yr (2130)	0.22	-25	-36	-40	-52	-55	-58
			0.6	-26	-39	-43	-56	-58	-63
			0.8	-27	-40	-44	-57	-60	-64
			1.25	-28	-42	-46	-59	-62	-68
			1.6	-28	-43	-47	-60	-63	-70
	29K	Current (2030)	0.03	-4	-5	-5	-7	-7	-8
		50yr (2080)	0.12	-6	-9	-9	-11	-11	-12
			0.2	-7	-10	-10	-12	-12	-14
			0.4	-7	-11	-11	-13	-14	-16
			0.6	-8	-12	-12	-15	-16	-17
		100yr (2130)	0.22	-9	-13	-13	-15	-16	-17
			0.6	-11	-16	-16	-19	-20	-22
			0.8	-11	-16	-17	-21	-22	-24
			1.25	-12	-18	-19	-23	-25	-27
			1.6	-13	-19	-20	-25	-27	-29
	29M	Current (2030)	0.03	-10	-15	-17	-22	-23	-25
		50yr (2080)	0.12	-11	-18	-19	-24	-26	-28
			0.2	-12	-18	-20	-25	-26	-28
			0.4	-12	-19	-20	-25	-27	-29
			0.6	-12	-19	-20	-26	-28	-30
		100yr (2130)	0.22	-12	-20	-22	-27	-29	-32
			0.6	-13	-21	-23	-29	-31	-34
			0.8	-13	-22	-23	-29	-31	-35
			1.25	-13	-23	-24	-30	-32	-36
			1.6	-13	-23	-25	-31	-33	-37
	29N	Current (2030)	0.03	-10	-16	-18	-23	-24	-26
		50yr (2080)	0.12	-11	-17	-19	-24	-26	-28
			0.2	-11	-17	-19	-25	-26	-28
			0.4	-11	-18	-19	-25	-26	-29
			0.6	-11	-18	-19	-25	-27	-29
		100yr (2130)	0.22	-11	-18	-20	-26	-27	-31
			0.6	-11	-19	-21	-27	-28	-31
			0.8	-11	-19	-21	-27	-29	-32
			1.25	-11	-20	-21	-27	-29	-32
			1.6	-11	-20	-21	-28	-30	-33

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	$P_{66\%}$	$P_{50\%}$	$P_{5\%}$	$P_{1\%}$	Max
	29O	Current (2030)	0.03	-7	-12	-13	-18	-19	-22
		50yr (2080)	0.12	-7	-13	-14	-19	-21	-24
			0.2	-7	-13	-14	-19	-21	-24
			0.4	-7	-13	-14	-19	-21	-24
			0.6	-7	-13	-15	-20	-21	-25
		100yr (2130)	0.22	-7	-14	-15	-20	-22	-26
			0.6	-7	-15	-16	-21	-23	-27
			0.8	-7	-15	-16	-21	-23	-27
			1.25	-7	-15	-16	-22	-24	-28
			1.6	-7	-15	-16	-22	-24	-28
	29P	Current (2030)	0.03	-9	-14	-15	-19	-20	-22
		50yr (2080)	0.12	-10	-15	-17	-20	-22	-24
			0.2	-10	-16	-17	-21	-22	-24
			0.4	-10	-16	-17	-21	-22	-25
			0.6	-10	-16	-17	-21	-23	-25
		100yr (2130)	0.22	-10	-17	-18	-22	-23	-26
			0.6	-10	-17	-18	-23	-24	-27
			0.8	-10	-17	-18	-23	-25	-28
			1.25	-10	-18	-19	-24	-26	-28
			1.6	-10	-18	-19	-24	-26	-29
	29Q	Current (2030)	0.03	-1	-3	-3	-4	-4	-5
		50yr (2080)	0.12	-2	-4	-4	-6	-6	-7
			0.2	-2	-4	-4	-6	-6	-7
			0.4	-2	-4	-4	-6	-7	-8
			0.6	-2	-4	-5	-6	-7	-8
		100yr (2130)	0.22	-2	-5	-5	-7	-8	-10
			0.6	-2	-5	-6	-9	-9	-11
			0.8	-2	-5	-6	-9	-10	-11
			1.25	-2	-6	-6	-10	-11	-12
			1.6	-2	-6	-6	-10	-11	-13
	29R	Current (2030)	0.03	-9	-12	-13	-16	-17	-18
		50yr (2080)	0.12	-9	-14	-15	-18	-19	-20
			0.2	-9	-14	-15	-18	-19	-20
			0.4	-9	-14	-15	-18	-19	-20
			0.6	-9	-14	-15	-18	-19	-21
		100yr (2130)	0.22	-9	-15	-16	-19	-20	-22
			0.6	-9	-15	-16	-20	-22	-23
			0.8	-9	-15	-16	-21	-22	-23
			1.25	-9	-16	-17	-21	-22	-24

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	**$P_{66\%}$**	**$P_{50\%}$**	**$P_{5\%}$**	**$P_{1\%}$**	**Max**
			1.6	-9	-16	-17	-21	-23	-25
	29S	**Current (2030)**	0.03	*No CEHA (Refer to future MHWS layer in Stephens, 2018)*					
		50yr (2080)	0.12						
			0.2						
			0.4						
			0.6						
		100yr (2130)	0.22						
			0.6						
			0.8						
			1.25						
			1.6						

Notes:
- Aerial photograph sourced from the LINZ Data Service (dated 2015)
- Coastal Erosion Hazard Areas (CEHA) are offset from the baseline (2014-2017)
- Refer to Stephens, 2018 for all MHWS7 scenarios

A3 SCALE 1:15,000

0 0.3 0.6 (km)

Tonkin+Taylor
105 Carlton Gore Rd, Newmarket, Auckland
www.tonkintaylor.co.nz

DRAWN	RHAU	Dec.18
CHECKED		
APPROVED		
ARCFILE	CEHA OverviewFINAL.mxd	
SCALE (AT A3 SIZE)	1:15,000	
PROJECT No.	1001628.1000	

Tauranga Harbour Coastal Erosion Assessment

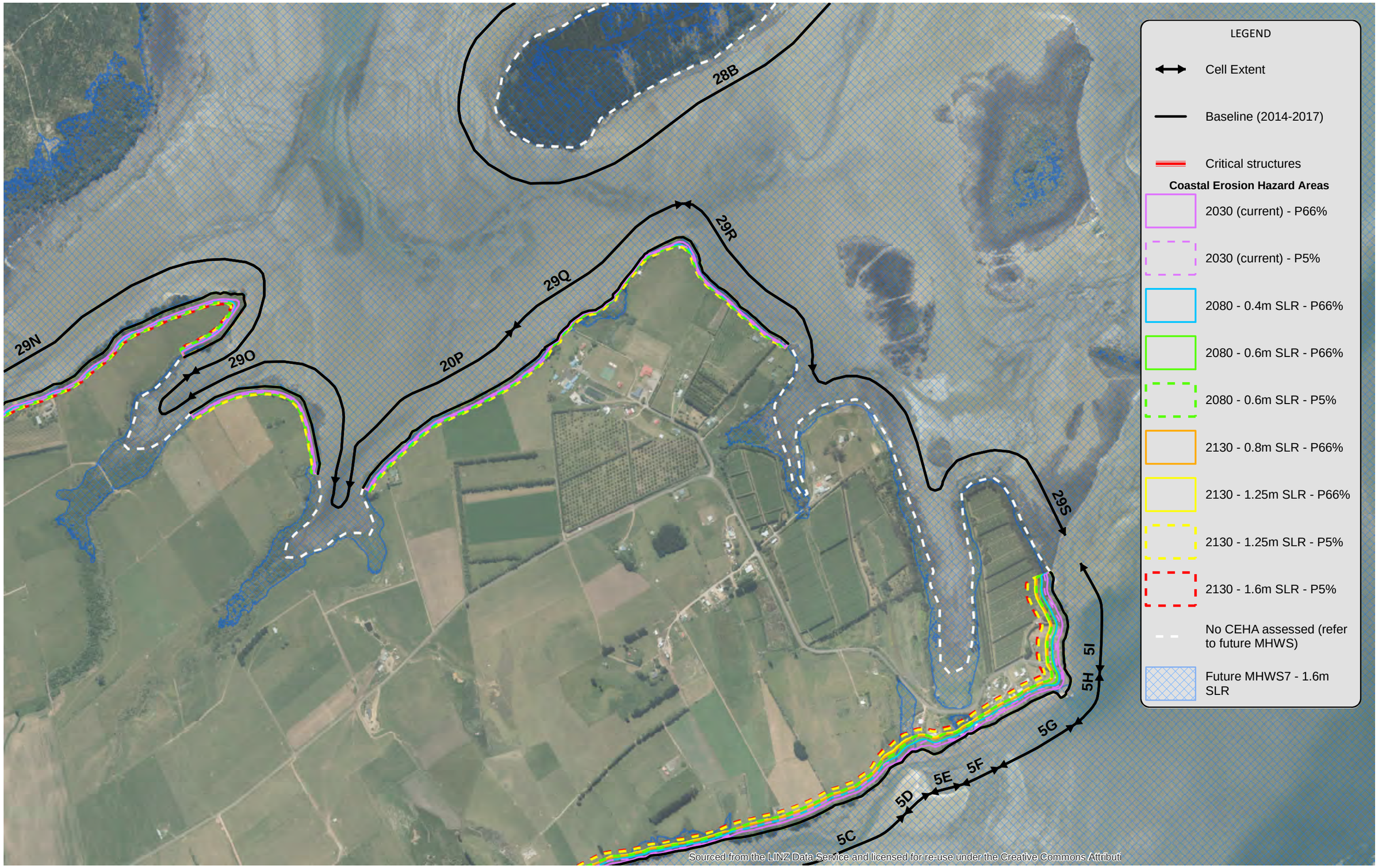
Erosion Hazard Overview

Site 29A: Matakana North

FIGURE No. Figure 29-4

Rev. 0

Path: E:\Final shapefiles 20181210\CEHA OverviewFINAL.mxd Date: 11/12/2018 Time: 10:16:01 AM



Notes:
- Aerial photograph sourced from the LINZ Data Service (dated 2015)
- Coastal Erosion Hazard Areas (CEHA) are offset from the baseline (2014-2017)
- Refer to Stephens, 2018 for all MHWS7 scenarios

A3 SCALE 1:10,000

0 0.2 0.4 (km)

Tonkin+Taylor
105 Carlton Gore Rd, Newmarket, Auckland
www.tonkintaylor.co.nz

DRAWN	RHAU	Dec.18
CHECKED		
APPROVED		
ARCFILE	CEHA OverviewFINAL.mxd	
SCALE (AT A3 SIZE)	1:10,000	
PROJECT No.	1001628.1000	

Tauranga Harbour Coastal Erosion Assessment

Erosion Hazard Overview

Site 29B: Matakana North

FIGURE No. Figure 29-4

Rev. 0

Path: E:\Final shapefiles 20181210\CEHA OverviewFINAL.mxd Date: 11/12/2018 Time: 10:17:36 AM