
Appendix P – MCA detailed results

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Management Options Assessment for Dune Management - Evaluation Matrix

Stanwell Park

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 3
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling		0	0	1	-2	-3	3	Rank
	<i>Sub Total</i>	0.00	0.00	2.19	-5.00	-1.88	0.00	-4.69
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		0	0	0	0	1	1	Rank 2
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.63	0.00	0.63
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Coalcliff

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 3
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		0	0	0	0	1	1	Rank 2
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.63	0.00	0.63
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Scarborough

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 3
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species		0	0	0	0	2	1	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		0	0	0	0	1	1	Rank 2
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.63	0.00	0.63
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Coledale

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 3
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		0	0	0	0	1	1	Rank 2
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.63	0.00	0.63
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Austinmer

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species								Rank N/A
	<i>Sub Total</i>							
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of Acacia longifolia								Rank N/A
	<i>Sub Total</i>							
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Thirroul

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species								Rank N/A
	<i>Sub Total</i>							
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of Acacia longifolia								Rank N/A
	<i>Sub Total</i>							
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Sandon Point

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 3
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of Acacia longifolia		0	0	0	0	1	1	Rank 2
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.63	0.00	0.63
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Bulli

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 11
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC		2	0	0	0	0	0	Rank 3
	<i>Sub Total</i>	6.25	0.00	0.00	0.00	0.00	0.00	6.25
Build a tower		3	0	0	0	-1	1	Rank 1
	<i>Sub Total</i>	9.38	0.00	0.00	0.00	-0.63	0.00	8.75
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight		1	0	0	0	-1	1	Rank 8
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	-0.63	0.00	2.50
Additional management of noxious and invasive weed species		0	0	0	0	2	2	Rank 9
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone		1	1	2	-3	-2	1	Rank 10
	<i>Sub Total</i>	3.13	1.56	4.38	-7.50	-1.25	0.00	0.31
Reduce dune height by re-profiling		2	2	2	-3	-3	3	Rank 4
	<i>Sub Total</i>	6.25	3.13	4.38	-7.50	-1.88	0.00	4.38
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		1	0	0	0	1	2	Rank 6
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	0.63	0.00	3.75
Improve beach access ways		0	3	0	0	-1	0	Rank 5
	<i>Sub Total</i>	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
Raise level of observation area in SLSC and remove vegetation from frontal zone		2	1	2	-3	-2	1	Rank 7
	<i>Sub Total</i>	6.25	1.56	4.38	-7.50	-1.25	0.00	3.44
Build a tower and remove vegetation from frontal zone		3	1	2	-3	-2	1	Rank 2
	<i>Sub Total</i>	9.38	1.56	4.38	-7.50	-1.25	0.00	6.56

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Woonona

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 11
	Sub Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC		2	0	0	0	0	0	Rank 4
	Sub Total	6.25	0.00	0.00	0.00	0.00	0.00	6.25
Build a tower								Rank N/A
	Sub Total							
Relocate existing tower		3	0	0	0	-1	1	Rank 2
	Sub Total	9.38	0.00	0.00	0.00	-0.63	0.00	8.75
Remove trees and shrubs affecting line of sight		2	0	0	0	-2	2	Rank 7
	Sub Total	6.25	0.00	0.00	0.00	-1.25	0.00	5.00
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 10
	Sub Total	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone		1	1	2	-1	-2	2	Rank 5
	Sub Total	3.13	1.56	4.38	-2.50	-1.25	0.00	5.31
Reduce dune height by re-profiling		2	1	2	-2	-3	3	Rank 5
	Sub Total	6.25	1.56	4.38	-5.00	-1.88	0.00	5.31
Build seawall		3	1	-3	-3	-3	3	Rank
	Sub Total	9.38	1.56	-6.56	-7.50	-1.88	0.00	-5.00
Management of subspecies of <i>Acacia longifolia</i>		1	0	0	0	1	1	Rank 9
	Sub Total	3.13	0.00	0.00	0.00	0.63	0.00	3.75
Improve beach access ways		0	3	0	0	-1	0	Rank 8
	Sub Total	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
Raise level of observation area in SLSC and remove vegetation from frontal zone		2	1	2	-1	-2	2	Rank 3
	Sub Total	6.25	1.56	4.38	-2.50	-1.25	0.00	8.44
Relocate existing tower and remove vegetation from frontal zone		3	1	2	-1	-2	2	Rank 1
	Sub Total	9.38	1.56	4.38	-2.50	-1.25	0.00	11.56

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Bellambi

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 11
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC		3	0	0	0	0	0	Rank 4
	<i>Sub Total</i>	9.38	0.00	0.00	0.00	0.00	0.00	9.38
Build a tower		3	0	0	0	-1	1	Rank 5
	<i>Sub Total</i>	9.38	0.00	0.00	0.00	-0.63	0.00	8.75
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight		1	0	0	0	-2	1	Rank 9
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	-1.25	0.00	1.88
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 10
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone		1	1	1	0	-1	1	Rank 6
	<i>Sub Total</i>	3.13	1.56	2.19	0.00	-0.63	0.00	6.25
Reduce dune height by re-profiling		2	2	2	0	-3	3	Rank 3
	<i>Sub Total</i>	6.25	3.13	4.38	0.00	-1.88	0.00	11.88
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		1	0	0	0	1	2	Rank 8
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	0.63	0.00	3.75
Improve beach access ways		0	3	0	0	-1	0	Rank 7
	<i>Sub Total</i>	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
Build a tower and remove vegetation from frontal zone		3	1	1	0	-1	1	Rank 1
	<i>Sub Total</i>	9.38	1.56	2.19	0.00	-0.63	0.00	12.50
Raise level of observation area in SLSC and remove vegetation from frontal zone		3	1	1	0	-1	1	Rank 1
	<i>Sub Total</i>	9.38	1.56	2.19	0.00	-0.63	0.00	12.50

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Corrimal

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 9
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower		3	0	0	0	-1	1	Rank 4
	<i>Sub Total</i>	9.38	0.00	0.00	0.00	-0.63	0.00	8.75
Remove trees and shrubs affecting line of sight		1	0	0	0	-2	2	Rank 7
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	-1.25	0.00	1.88
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 8
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone		1	2	2	0	-2	2	Rank 3
	<i>Sub Total</i>	3.13	3.13	4.38	0.00	-1.25	0.00	9.38
Reduce dune height by re-profiling		2	2	2	0	-3	3	Rank 2
	<i>Sub Total</i>	6.25	3.13	4.38	0.00	-1.88	0.00	11.88
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		1	0	0	0	2	2	Rank 5
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	1.25	0.00	4.38
Improve beach access ways		0	3	0	0	-1	0	Rank 6
	<i>Sub Total</i>	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
Relocate existing tower and remove vegetation from frontal zone		3	2	2	0	-2	2	Rank 1
	<i>Sub Total</i>	9.38	3.13	4.38	0.00	-1.25	0.00	15.63

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Towradgi

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 9
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower		3	0	0	0	-1	1	Rank 2
	<i>Sub Total</i>	9.38	0.00	0.00	0.00	-0.63	0.00	8.75
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight		1	0	0	0	-1	1	Rank 7
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	-0.63	0.00	2.50
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 8
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone		1	2	2	-2	-2	2	Rank 3
	<i>Sub Total</i>	3.13	3.13	4.38	-5.00	-1.25	0.00	4.38
Reduce dune height by re-profiling		2	2	2	-3	-3	3	Rank 3
	<i>Sub Total</i>	6.25	3.13	4.38	-7.50	-1.88	0.00	4.38
Build seawall		3	2	-3	-3	-2	2	Rank
	<i>Sub Total</i>	9.38	3.13	-6.56	-7.50	-1.25	0.00	-2.81
Management of subspecies of <i>Acacia longifolia</i>		1	0	0	0	1	2	Rank 6
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	0.63	0.00	3.75
Improve beach access ways		0	3	0	0	-1	0	Rank 5
	<i>Sub Total</i>	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
Build a tower and remove vegetation from frontal zone		3	2	2	-2	-2	2	Rank 1
	<i>Sub Total</i>	9.38	3.13	4.38	-5.00	-1.25	0.00	10.63

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Fairy Meadow

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 11
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC		2	0	0	0	0	0	Rank 5
	<i>Sub Total</i>	6.25	0.00	0.00	0.00	0.00	0.00	6.25
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower		3	0	0	0	-1	1	Rank 3
	<i>Sub Total</i>	9.38	0.00	0.00	0.00	-0.63	0.00	8.75
Remove trees and shrubs affecting line of sight		1	0	0	0	-2	2	Rank 9
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	-1.25	0.00	1.88
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 10
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone		1	1	2	-1	-2	2	Rank 6
	<i>Sub Total</i>	3.13	1.56	4.38	-2.50	-1.25	0.00	5.31
Reduce dune height by re-profiling		2	2	2	-1	-3	3	Rank 2
	<i>Sub Total</i>	6.25	3.13	4.38	-2.50	-1.88	0.00	9.38
Build seawall		3	2	-3	-3	-2	2	Rank
	<i>Sub Total</i>	9.38	3.13	-6.56	-7.50	-1.25	0.00	-2.81
Management of subspecies of <i>Acacia longifolia</i>		1	0	0	0	1	2	Rank 8
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	0.63	0.00	3.75
Improve beach access ways		0	3	0	0	-1	0	Rank 7
	<i>Sub Total</i>	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
Raise level of observation area in SLSC and remove vegetation from frontal zone		2	1	2	-1	-2	2	Rank 4
	<i>Sub Total</i>	6.25	1.56	4.38	-2.50	-1.25	0.00	8.44
Relocate existing tower and remove vegetation from frontal zone		3	1	2	-1	-2	2	Rank 1
	<i>Sub Total</i>	9.38	1.56	4.38	-2.50	-1.25	0.00	11.56

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix
North Wollongong

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 1
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species								Rank N/A
	<i>Sub Total</i>							
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of Acacia longifolia								Rank N/A
	<i>Sub Total</i>							
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

City

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 8
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower		2	0	0	0	-1	1	Rank 2
	<i>Sub Total</i>	6.25	0.00	0.00	0.00	-0.63	0.00	5.63
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species		0	0	0	0	2	0	Rank 7
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone		1	2	2	-3	-2	2	Rank 6
	<i>Sub Total</i>	3.13	3.13	4.38	-7.50	-1.25	0.00	1.88
Reduce dune height by re-profiling		2	3	2	-3	-3	3	Rank 1
	<i>Sub Total</i>	6.25	4.69	4.38	-7.50	-1.88	0.00	5.94
Build seawall		3	2	-3	-3	-3	2	Rank
	<i>Sub Total</i>	9.38	3.13	-6.56	-7.50	-1.88	0.00	-3.44
Management of subspecies of Acacia longifolia		1	0	0	0	1	2	Rank 5
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	0.63	0.00	3.75
Improve beach access ways		0	3	0	0	-1	1	Rank 4
	<i>Sub Total</i>	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
Build a tower and remove vegetation from frontal zone		2	2	2	-3	-2	2	Rank 3
	<i>Sub Total</i>	6.25	3.13	4.38	-7.50	-1.25	0.00	5.00

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Port Kembla

This assessment has assumed patrol is from Clubhouse and not tower near pool

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
<i>Maintain current management</i>		0	0	0	0	0	0	Rank 9
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Raise level of observation area in SLSC</i>								Rank N/A
	<i>Sub Total</i>							
<i>Build a tower</i>		3	0	0	0	-1	1	Rank 3
	<i>Sub Total</i>	9.38	0.00	0.00	0.00	-0.63	0.00	8.75
<i>Relocate existing tower</i>								Rank N/A
	<i>Sub Total</i>							
<i>Remove trees and shrubs affecting line of sight</i>		1	0	0	0	-2	2	Rank 7
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	-1.25	0.00	1.88
<i>Additional management of noxious and invasive weed species</i>		0	0	0	0	2	0	Rank 8
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
<i>Remove vegetation from frontal zone</i>		0	1	1	0	-1	2	Rank 6
	<i>Sub Total</i>	0.00	1.56	2.19	0.00	-0.63	0.00	3.13
<i>Reduce dune height by re-profiling</i>		2	2	2	0	-3	3	Rank 2
	<i>Sub Total</i>	6.25	3.13	4.38	0.00	-1.88	0.00	11.88
<i>Build seawall</i>		3	2	-3	-3	-2	2	Rank
	<i>Sub Total</i>	9.38	3.13	-6.56	-7.50	-1.25	0.00	-2.81
<i>Management of subspecies of Acacia longifolia</i>		1	0	0	0	1	2	Rank 5
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	0.63	0.00	3.75
<i>Improve beach access ways</i>		0	3	0	0	-1	1	Rank 4
	<i>Sub Total</i>	0.00	4.69	0.00	0.00	-0.63	0.00	4.06
<i>Build a tower and remove vegetation from frontal zone</i>		3	1	1	0	-1	2	Rank 1
	<i>Sub Total</i>	9.38	1.56	2.19	0.00	-0.63	0.00	12.50

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

Management Options Assessment for Dune Management - Evaluation Matrix

Windang

		Criteria						TOTAL
		A	B	C	D	E	F	
		Sight line	Beach access	Recreational amenity	Coastal hazards impacts	Ecology	Pests and vermin	
		3.13	1.56	2.19	2.50	0.63	0.00	
Maintain current management		0	0	0	0	0	0	Rank 3
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raise level of observation area in SLSC								Rank N/A
	<i>Sub Total</i>							
Build a tower								Rank N/A
	<i>Sub Total</i>							
Relocate existing tower								Rank N/A
	<i>Sub Total</i>							
Remove trees and shrubs affecting line of sight								Rank N/A
	<i>Sub Total</i>							
Additional management of noxious and invasive weed species		0	0	0	0	2	1	Rank 2
	<i>Sub Total</i>	0.00	0.00	0.00	0.00	1.25	0.00	1.25
Remove vegetation from frontal zone								Rank N/A
	<i>Sub Total</i>							
Reduce dune height by re-profiling								Rank N/A
	<i>Sub Total</i>							
Build seawall								Rank N/A
	<i>Sub Total</i>							
Management of subspecies of <i>Acacia longifolia</i>		1	0	0	0	1	2	Rank 1
	<i>Sub Total</i>	3.13	0.00	0.00	0.00	0.63	0.00	3.75
Improve beach access ways								Rank N/A
	<i>Sub Total</i>							

Note - Management Options with negative scores were discarded as they indicate actions worse than the current management actions

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Appendix Q – Wollongong coastal erosion emergency action sub plan

Prepared by BMT WBM Pty Ltd January 2012

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Wollongong Coastal Erosion Emergency Action Sub Plan

January 2012

Prepared For: Wollongong City Council

Prepared By: BMT WBM Pty Ltd (Member of the BMT group of companies)

Offices
*Brisbane
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Mackay
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Perth
Sydney
Vancouver*

DOCUMENT CONTROL SHEET

<p>BMT WBM Pty Ltd BMT WBM Pty Ltd 126 Belford Street BROADMEADOW NSW 2292 Australia PO Box 266 Broadmeadow NSW 2292</p> <p>Tel: +61 2 4940 8882 Fax: +61 2 4940 8887</p> <p>ABN 54 010 830 421 www.bmtwbm.com.au</p>	<p>Document : R.N1965.001.04App_EASP.docx</p> <p>Project Manager : Verity Rollason</p> <hr/> <p>Client : Wollongong City Council</p> <p>Client Contact: Philomena Gangaiya</p> <p>Client Reference</p>
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Title:	Wollongong Coastal Erosion Emergency Action Sub Plan
Author :	Doug Lord (Coastal Environment Pty Ltd)
Synopsis :	This Wollongong Coastal Erosion Emergency Action Sub Plan forms an Appendix to the Wollongong Coastal Zone Management Study and Plan. This sub-plan outlines actions to be performed before, during and after an erosion emergency and the roles and responsibilities for coastal erosion emergencies.

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REVISION NUMBER	DATE OF ISSUE	CHECKED BY	ISSUED BY
Appendix to Rev 3	02/12/11	VPR	VPR
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	0	1	2	3
WCC	1			
BMT WBM File	1			
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ACRONYMS

CEEAS	Coastal Erosion Emergency Action Sub-plan
CPA	Coastal Protection Act (1979)
DECCW	Department of Environment Climate Change and Water (former department, now OEH)
LEMC	Local Emergency Management Committee
LEOCON	Local Emergency Operations Controller
OEH	Office of Environment and Heritage
SERM	State Emergency and Rescue Management
SERMA	State Emergency and Rescue Management Act
WCC	Wollongong City Council

1 INTRODUCTION

1.1 Coastal Zone Management Planning

The process for managing coastal hazards and coastal risks along the New South Wales coast is through the preparation of Coastal Zone Management Plans. Through the development and subsequent implementation of these plans, the coastal hazards are identified and, as appropriate, the risks are addressed through a range of planning and protection measures. In this way the likelihood of emergencies resulting from erosion during storm events is minimised. The need for unplanned protection is reduced and the risk to life and property managed. The residual risk to properties, assets and life until such time as the key elements of the plan have been adopted or as a result of potential unforeseen outcomes or storm severity are covered by this Coastal Erosion Emergency Action Subplan (CEEAS).

The CEEAS is a required component of the preparation of a Coastal Zone Management Plan (CZMP) as set out in the NSW *Coastal Protection Act 1979* (the CPA). Section 55C(1)(b) of the CPA states a CZMP must provide for *'emergency actions carried out during periods of beach erosion, including the carrying out of related works, such as works for the protection of property affected or likely to be affected by beach erosion, where beach erosion occurs through storm activity or an extreme or irregular event'*. Section 4 of the CPA states that the part of a CZMP that deals with the matters specified in Section 55C(1)(b) is an emergency action sub plan (OEH 2011, page 1).

1.2 The Role of the Coastal Erosion Emergency Action Sub-plan

"The emergency action sub-plan forms an integral component of a CZMP. It outlines a council's intended response to a coastal erosion emergency and explains ways in which and where beachfront property owners can place emergency coastal protection works according to the Coastal Protection Act 1979 (CPA)" (OEH 2011, page 1).

*"Section 55C(2)(a) of the CPA requires that CZMPs **must not** include matters dealt with in any plan made under the State Emergency and Rescue Management Act 1989 (SERMA) in relation to emergency responses.*

The roles and responsibilities of government agencies, councils and other relevant organisations during severe storm events (including events that cause erosion) are detailed in the NSW State Storm Plan (SES 2007)" (OEH 2011, page 1).

1.3 Extent of the Coastal Erosion Emergency Action Sub-plan

The OEH Guide (2011) advises that *"The minimum area to be covered by an emergency action sub-plan would be either:*

- *any area defined by a direction from the Minister according to Section 55B of the CPA; or*
- *all beachfront margins where erosion is likely to threaten public and private infrastructure or assets.*

The sub-plan may also cover areas of the coastline accessed or utilised by the general public where there is an identified threat posed by erosion, e.g. walking tracks through coastal parkland.”

No direction has been issued under Section 55B for the Wollongong Local Government Area (LGA) coastal zone. The extent of this CEEAS is, therefore defined as the coastal margins of the ocean beaches and headlands within the city boundaries, extending from the Royal National Park at Stanwell Park in the North to the Lake Illawarra entrance in the south (excluding the Port Kembla Harbour foreshores).

1.4 Minimum Requirements for Emergency Action Sub-plans

The CEEAS must be consistent with and not duplicate or contradict any plans prepared under the *State Emergency and Rescue Management Act 1989* (SERM Act). The relationship between these two planning frameworks is indicated in Table 1 which has been adapted from OEH, 2011 (page 14).

Table 1 Contents of CEEAS and SERM Act plans (adapted from OEH, 2011)

Emergency Action Sub Plans	SERM Act Plans
Any coastal protection works or other actions to be carried out by council when coastal erosion is imminent or occurring, or in recovering from coastal erosion.	Actions in relation to the prevention of, preparation for, response to and recovery from emergencies, excluding permanent or temporary coastal protection works.
Any additional requirements for landowner placement of emergency coastal protection works beyond those in the <i>Coastal Protection Act 1979</i> (e.g. constraints on access and the location of works) *	Actions are consistent with the NSW State Disaster Plan and the State Storm Sub Plan.

* No locations for emergency coastal protection works in accordance with the CPA 1979 have been identified in the Wollongong LGA coastal zone.

Where landowners are eligible to place emergency coastal protection works, the CEEAS is to be prepared with direct consultation with landowners affected by the subplan. In the Wollongong LGA coastal zone at present there are no private properties identified as eligible to place emergency coastal protection works in accordance with the CPA 1979 (Part 4C). Therefore, this requirement is not currently applicable.

The minimum requirements for a Coastal Erosion Emergency Action Subplan are set out in the NSW Government Guideline (OEH, 2011) which reflects the requirements expressed in the CPA 1979. These are:

- describing intended emergency actions to be carried out during periods of beach erosion, such as coastal protection works for property or asset protection, other than matters dealt with in any plan made under the *State Emergency and Rescue Management Act 1989* relating to emergency response (sections 55C(1)(b) and (g) of the CPA 1979)
- describing any site-specific requirements for landowner emergency coastal protection works
- describing the consultation carried out with the owners of land affected by a subplan.

2 EMERGENCY PLANNING HIERARCHY

2.1 Declared Storm Emergency

There is a clear hierarchy in planning and responsibility that applies to emergency management in NSW, including those emergencies resulting from a defined storm or disaster. In these events, the NSW State Emergency Services are designated as the lead combat agency and are in charge of the emergency response. The various roles and responsibilities are defined in the NSW Storm Plan and within the City of Wollongong Local Disaster Plan (DISPLAN). The DISPLAN states at paragraphs 114 and 115 that:

“114 Subject to the requirements and provisions of the SERM Act, and under the provisions of the SES Act, for the emergencies of flood and damage control for storms, including the coordination of evacuation and welfare of affected communities, the overall control of operations in response to these emergencies is vested in the Director General of the State Emergency Service.

115 In both flood or storm emergencies, the DISPLAN for the District and/or any Local Area to which the emergency applies is automatically active and Police, the other Emergency Services and Functional Areas are to provide support as required by the Combat Agency Controller. The Local or District Emergency Operations Controller is then to be prepared to coordinate support if requested by the appointed Local/Division State Emergency Service Controller.”

Therefore, the Wollongong DISPLAN informs this Coastal Erosion Emergency Action Sub-plan.

The role of Council in a storm emergency is limited to those activities that may be requested by the SES to assist with the emergency relief or to activities (including protection works) undertaken by the Council to protect assets under Council control. Where any proposed protection works require development approval, Council must only undertake such works during an emergency where the consent has been obtained in advance. Where the works are exempt (such as minor works or emergency works to protect a road or stormwater system under SEPP (Infrastructure) 2007) Council must first undertake an assessment to determine that the works will not result in a significant adverse environmental impact. Before undertaking any works, Council must also confirm that the works proposed are in accordance with the currently gazetted (or adopted) Coastal Zone Management Plan.

There are no protection works proposed for emergency management purposes under this CEEAS that require development consent.

Following the emergency, Council is involved in the remediation of damage or hazards and the reinstatement of the dunes, beaches and accessways in an appropriate and safe manner. This will include works of varying priorities and timeframes in accordance with usual Council maintenance procedures.

2.2 Coastal Erosion Emergency (not triggered by a storm)

Where the erosion emergency arises from events other than a declared storm event, then the requirement of the State Storm Plan and Wollongong DISPLAN are not activated. Such an event could arise for example from a period of high tides and large swell, resulting in substantial erosion to the back of the beach. For these conditions it is likely that the erosion resulting would be substantially less than that which would result from the design storm event (unless such an event was to occur immediately following a severe storm event).

It is not possible to determine a trigger event for such an occurrence. Therefore, the determination to invoke the this emergency sub-plan (in this case by Council) would need to be based on monitoring of the beach state. In such a case, the CEEAS would be implemented following a request from the designated Council Officer.

2.3 Assets and Development at Threat

The extent of coastal hazards within the Wollongong LGA coastal zone is defined in the Wollongong City Council Coastal Zone Study (Cardno, 2010). This study maps the landward extent of erosion hazards that may be anticipated for various planning timeframes. Specifically, the landward extent of erosion hazards at present are defined in Maps included in the Wollongong Coastal Zone Study (Cardno, 2010) at Figures 8.5 to 8.13 and form the basis for defining the extent of the erosion hazard at present.

Within the Wollongong LGA coastal zone the extent of storm erosion resulting from a severe design storm event at present is mainly restricted to the sandy beach area with little public infrastructure or private property likely to be affected. Significant encroachments of the storm erosion extent threatening existing development are limited to the following locations:

- the parking area and ramp at Austinmer Boat Harbour (Cardno, 2010 Fig 8.5);
- the seaward portion of the Tuckerman Park carpark at Austinmer North (Cardno, 2010 Fig 8.6);
and
- Thirroul Beach carpark and promenade (Cardno, 2010 Fig 8.7).

At each of these locations the development likely to be impacted is protected by a seawall of unknown design. The potential encroachment of the erosion into these paved areas was calculated on the basis that the seawall at present offered no protection to beach erosion.

In addition to these specific developments there are different types of activities, development and areas that may be impacted during an erosion emergency. These include:

- stormwater and drainage outlet structures located on beaches;
- ocean baths and rock pools;
- defined beach and dune access tracks under care and control of Council; and
- the beaches and dunes.

These exist within an area of known high hazard and are either designed to accommodate the erosion events (such as the stormwater outlets and pools), or are temporarily affected by erosion, limiting their use by the community (such as beaches and accessways). In each case the opportunity to protect the asset prior to an erosion event is low and the risk to life during an event is low. Similarly, the opportunity to undertake emergency works during an event is low and the preferred approach is to identify impacts, assess and repair the asset following the event. In most instances this becomes a routine maintenance role.

The landward extent of the erosion hazard as considered in this CEEAS may increase into the future as sea level rises. The impacts on the future revisions of the CEEAS should take this into account at each plan review.

3 EMERGENCY RESPONSES

3.1 Communication

3.1.1 Storm Emergency

Where coastal erosion is anticipated as a result of a declared storm emergency, the responsibility for communicating the potential hazards defaults to the SES and the Local Emergency Operations Controller (LEOCON). Activation of the Wollongong DISPLAN would trigger this CEEAS. Council would assist in the provision of information on the current state of beaches and ocean pools as well as potential for impacts on beach access. Internally, Council staff with relevant responsibilities should be placed on standby and commence monitoring the impacts. Council employed Lifeguards and local Surf Life Saving Clubs should be contacted with a view to closure of beaches and ocean pools.

As the emergency progresses Council is required to continue monitoring these areas and updating information through the LEOCON as appropriate. Where specific hazards are resulting in damage, Council will provide this information to the LEOCON and for distribution through the media or directly to community as appropriate.

Following the emergency, Council is responsible for advising the current state of beaches and pools in the Council area (when/if they are re-opened for the public). Where residual hazards remain to be addressed, Council should take appropriate action to convey this to local communities including the use of signage and the release of media bulletins.

3.1.2 Non Storm Erosion Emergency

Where the emergency does not trigger the State Storm Plan or Wollongong DISPLAN, Council is responsible for initially monitoring the potential progress of erosion and subsequently implementing this CEEAS. The roles and responsibilities of Council in communicating the emergency to the community remain the same except that information needs to be provided by Council directly through the media rather than through the LEOCON as outlined in Section 3.1.1 above.

3.2 Landowner Initiated Actions

There are no locations in the Wollongong LGA coastal zone at which temporary emergency coastal protection works (CPA 1979, Part 4c Sand/Sandbags ECPW) are permitted. This includes properties within the immediate erosion hazard line in the LGA, such as at Thirroul Beach. Temporary emergency coastal protection works are only permitted under the CPA 1979 at locations listed in Schedule 1 of that act, none of which exist in Wollongong LGA.

Property owners, such as those at locations within the immediate erosion hazard line, are permitted to submit development applications to install permanent protection works, provided such works are consistent with the Wollongong CZMP once it is certified.

Where property owners wish to install permanent protection works (either prior to or during a coastal erosion emergency):

- they must submit a development application for the works,

- they must have a valid approval, and
- they must comply with all conditions of consent applying to that approval, before proceeding with the works.

Any illegal works placed by a property owner may result in prosecution of the person and removal of the works.

A property owner may be able to undertake minor works to minimise damage to their property and/or dwelling where such works do not require development approval and do not result in adverse impacts. The types of things permitted without consent are unlikely to provide significant protection from any coastal erosion that is occurring but may limit consequent damage, for example: Sealing of the space at the bottom of a doorway to limit water entry, repair/replacement of damaged windows, cladding or roofing, clearing of drains, pumping of ponded water, removal of objects from proximity to an escarpment (such as fences, sheds, furniture), etc.

The owner of a property has the right to undertake a wide variety of activities/maintenance in relation to their property which may or may not result from damage during a storm event and which, generally are of a minor nature. As with all activities there is a common law obligation not to cause a nuisance to neighbours or damage to adjacent properties. Generally those works resulting in structural alterations to a building (de including demolition or removal), or significant construction (such as a retaining wall or underpinning a structure) or significant earthworks (excavation or placement of fill) would require prior development/building approval.

3.3 Council Actions Prior to a Coastal Erosion Emergency

- Where the likelihood of an emergency event is identified (e.g. Storm warnings or damaging wave warnings from the SES/BOM), the local Lifeguards (employed by Council) will inform the local Surf Life Saving Clubs. The Council Lifeguards and / or the local SLSCs will then take the appropriate action in terms of closing the beaches and/or ocean pools.
- Where difficulties/damage are known to exist on beach accessways and these are likely to be exacerbated by storm erosion, then Council at their discretion may close those walkways and place appropriate signage.
- Council will commence monitoring the effects of the erosion on assets and development potentially at threat (section 5).
- As appropriate, the Council CEEAS controller will initiate the CEEAS.

3.4 Council Actions During a Coastal Erosion Emergency

The following activities would be undertaken by Council during the emergency:

- Council activities during a coastal erosion emergency will be guided by issues relating to the safety of Council staff.

- Where damage to walkways is identified and/or reported to Council, as practical Council will take appropriate action to close off the accessways and/or advise the local community of the hazards at the first opportunity.
- Where damage to assets is identified through monitoring (Section 5), Council will assess the damage and any opportunities for limiting further damage that may be appropriate during the event.
- Where repairs are permissible (as outlined in Section 2.1) and may be readily and safely undertaken, this will be done at the first opportunity.
- At the appropriate time the CEEAS controller will determine that the emergency has passed and that the remediation stages of the plan are to commence.

3.5 Council Actions Following the Cessation of a Coastal Erosion Emergency

The following activities would be undertaken by Council following the emergency, within their usual maintenance programs.

- Following the erosion emergency, Council will undertake an inspection of all beach accessways to establish any damage to the access or dangers to the public in using the access to the beach.
- Where an accessway is considered unsafe, action will be taken to close the access (top and/or bottom) and to place appropriate signage warning the access is unsafe for use.
- Council will prioritise the work required to repair and reopen any damaged or unsafe accessways in accordance with the Council maintenance works schedule.
- Where an erosion escarpment has been created at the back of the beach (height greater than 1.5m), Council will document the extent of the escarpment and at the earliest opportunity undertake a risk assessment of the likely hazard to beach users (both to persons on the beach and to persons on the dune above the scarp) from collapse of the erosion scarp.
- Where the risk is deemed unacceptable, Council will at the earliest opportunity undertake appropriate mitigation works which may include:
 - regrading the escarpment to a stable slope (following approval from Council's environment division);
 - fencing and signposting escarpments, to discourage public access (top and/or bottom) until such time as the beach recovers naturally; and
 - keeping the beach closed until such time as the risk has reduced to an acceptable level.
- At the appropriate time the Council CEEAS controller will declare the emergency has finished and the CEEAS is no longer operative.

4 RESPONSIBILITIES

Specific responsibilities under the CEEAS are tabulated in Table 2.

Council through the nominated CEEAS controller must tabulate relevant Council positions and responsibilities for implementation and execution of the CEEAS. This will require an up to date list (names and contact numbers) for relevant contacts to be maintained by Council and updated as positions or responsibilities change. This list is to be readily available within Council and communicated to each of the nominated contact persons following any update.

Table 2 Specific Responsibilities in implementation of the CEEAS

Position	Responsibilities
Local Emergency Operations Controller (LEOCON)	Execution of the Local DISPLAN, including aspects relating to coastal erosion
Council CEEAS controller	Liaison with LEOCON during storm emergency. Implementation of the CEEAS during non-storm erosion emergency
Council Recreation Services Manager	Monitoring repair of beaches and dunes. Closure of Beaches and ocean pools as appropriate. Post storm remediation.
Council Media Liaison Officer	Distribution of warnings and closures via the media.

5 PLAN REVIEW

This coastal erosion emergency management plan should be maintained as required and reviewed at intervals not exceeding 5 years from its initial adoption. Earlier review may be triggered by:

- occurrence of a coastal erosion emergency that exceeds the defined hazard extent as outlined in the Wollongong City Council Coastal Zone Study (Cardno, 2010) to redefine the extent of the area covered by the Plan;
- revision of the NSW State Storm Plan, the Local DISPLAN (revised each five years) or the Coastal Protection Legislation and associated guides, to ensure the plan remains consistent with their objectives;
- unsatisfactory outcomes or concerns following a coastal erosion emergency; or
- proposed changes to the gazetted Coastal Zone Management Plan.

6 REFERENCES

BMT WBM (2011). *Wollongong Coastal Zone Management Plan: Management Study* Final Report, prepared for Wollongong City Council by BMT WBM, January 2011.

Cardno (2010). *Wollongong City Council Coastal Zone Study* 3 volumes LJ2822/R2564/v2, prepared for Wollongong City Council by Cardno Lawson Treloar, 30 June 2010.

City of Wollongong (2006). *City of Wollongong Local Disaster Plan (Displan)* Amendment 3 as at 15 March 2006, prepared by the Wollongong Local Emergency Management Committee in compliance with the State Emergency and Rescue Management Act, 1989 Section 29 (1).

DECCW (2010). *Guidelines for Preparing Coastal Zone Management Plans*, NSW Department of Environment Climate Change and Water, ISBN 978-1-74293-051-0, DECCW2010/1019, December 2010.

OEH (2011). *Coastal Zone Management Guide note – Emergency action subplans*, NSW Office of Environment and Heritage, ISBN 978 1 74293 300 9. OEH 2011/0631. July 2011.



BMT WBM Brisbane
Level 8, 200 Creek Street Brisbane 4000
PO Box 203 Spring Hill QLD 4004
Tel +61 7 3831 6744 Fax +61 7 3832 3627
Email bmtwbm@bmtwbm.com.au
Web www.bmtwbm.com.au

BMT WBM Denver
14 Inverness Drive East, #B132
Englewood Denver Colorado 80112 USA
Tel +1 303 792 9814 Fax +1 303 792 9742
Email denver@bmtwbm.com
Web www.bmtwbm.com.au

BMT WBM Mackay
Suite 1, 138 Wood Street Mackay 4740
PO Box 4447 Mackay QLD 4740
Tel +61 7 4953 5144 Fax +61 7 4953 5132
Email mackay@bmtwbm.com.au
Web www.bmtwbm.com.au

BMT WBM Melbourne
Level 5, 99 King Street Melbourne 3000
PO Box 604 Collins Street West VIC 8007
Tel +61 3 8620 6100 Fax +61 3 8620 6105
Email melbourne@bmtwbm.com.au
Web www.bmtwbm.com.au

BMT WBM Newcastle
126 Belford Street Broadmeadow 2292
PO Box 266 Broadmeadow NSW 2292
Tel +61 2 4940 8882 Fax +61 2 4940 8887
Email newcastle@bmtwbm.com.au
Web www.bmtwbm.com.au

BMT WBM Perth
Suite 3, 1161 Hay Street West Perth 6005
Tel +61 8 9328 2029 Fax +61 8 9486 7588
Email perth@bmtwbm.com.au
Web www.bmtwbm.com.au

BMT WBM Sydney
Level 1, 256-258 Norton Street Leichhardt 2040
PO Box 194 Leichhardt NSW 2040
Tel +61 2 9713 4836 Fax +61 2 9713 4890
Email sydney@bmtwbm.com.au
Web www.bmtwbm.com.au

BMT WBM Vancouver
401 611 Alexander Street Vancouver
British Columbia V6A 1E1 Canada
Tel +1 604 683 5777 Fax +1 604 608 3232
Email vancouver@bmtwbm.com
Web www.bmtwbm.com.au

GHD

133 Castlereagh St Sydney NSW 2000


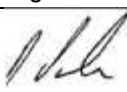
T: 2 9239 7100 F: 2 9239 7199 E: sydmail@ghd.com.au

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