



EAC – Ecological Evaluation Pty Ltd

5/26 Hack Street Mount Barker 5251

Ph: 8185 3225 Mob: 0438 140 237

Nora Creina BushRAT vegetation Survey October 2014

On the 21st & 22nd of October 2014 EAC Ecological Evaluation PTY LTD conducted Bushland Rapid Assessment Technique (BushRAT) vegetation surveys at the Scanlon property at Nora Creina, situated between Robe and Beachport in the South-east of South Australia.

BushRAT is a method developed by the Native Vegetation Management Unit of the SA Department of Environment, Water and Natural Resources (DEWNR), in conjunction with the Nature Conservation Society of South Australia (NCSSA) to assess the biodiversity value of patches of native vegetation. BushRAT is designed for use in the agricultural regions of SA and it separately scores a variety of attributes including vegetation condition, conservation value and landscape context and then weights these attributes according to their importance.

Benchmark vegetation communities, based on those developed by the NCSSA for its Bushland Condition Monitoring (BCM) method, have been identified for South Australia. The benchmarks represent each vegetation community in a relatively undisturbed state. When a site is assessed using BushRAT, the condition attribute scores are assessed against the scores from the benchmark communities. During the surveys 8 vegetation associations were identified, many of them in excellent condition.

BushRAT scoring for flora and fauna

Sites are assessed and given scores for flora and fauna depending on whether they are recorded nearby or during the time of the survey or whether it is deemed that there is suitable habitat. Assigning a score is also reliant on the assessor's technical observations and judgement.

How scores are calculated: -

- If there is poor habitat features, or poor condition and nothing is sighted during the survey, then the site gets a score of zero.
- If there are records from within the area of birds using similar habitat and the habitat is deemed suitable/ potential for a threatened species then half points are assigned. For example if there is suitable habitat for a migratory bird such as the Orange Bellied Parrot then half points are assigned and/ or if there have been recent records from in the area.
- If during the survey a threatened bird/ plant species is recorded, then this increases the score to full points. During this survey a Swamp Wallaby was recorded in area 5 and the Little Dip Spider-orchid in area 2. High point's scores are also assigned to threatened ecosystems such as swamps, for example area 8.



Note that this was not a fauna survey and scores are therefore based on potential or suitable habitat. During the survey it was noted that the site provides suitable habitat for a variety of threatened fauna species recorded in the area and EAC recommends a further 2 day/ night fauna survey conducted of the wetlands. Without further investigation it is unknown what occurs to ascertain what is present in the wetland areas, it is possible that future works could potentially impact on fauna through altered hydrology causing increased nutrient loads, increased salinity and further dune blowouts leading to a loss of critical habitat.

Below are the BushRAT survey site summary tables and maps. Individual scoresheets are included in the appendix.

Yours sincerely,



Ben McCallum
Director, EAC-Ecological Evaluation Pty Ltd
Ph: 0438 140 237
Email: ben.mccallum@eacpl.com.au

Document Information	
Client	D Scanlon & J Scanlon
Issue Date	2/2/2014
Version	1.3
Author	Ben J McCallum
Title	Nora Creina BushRAT vegetation Survey October 2014
Signature	
Verified by	Sarah Telfer
Title	Director
Signature	

Document History	
Version	Issue Date
1.0 draft	1/2/2014

EAC – Ecological Evaluation Pty Ltd have prepared this report for the sole purposes of the Client for the specific purpose only for which it is supplied. We accept no liability for any direct or consequential loss arising from the transmission of this information to third parties. This report is current at the date of writing only and EAC – Ecological Evaluation Pty Ltd will not be responsible for informing of any future changes in circumstances which may affect the accuracy of the information contained in this report. EAC – Ecological Evaluation Pty Ltd does not offer or hold itself out as offering any advice relating to legal or regulatory implications.

Certain assumptions have been made in the preparation of this report. We have assumed that all information and documents provided to us by the Client or as a result of a specific request or enquiry were complete, accurate and up-to-date. Where we have obtained information from a government register or database, we have assumed that the information is accurate. Where an assumption has been made, we have not made any independent investigations with respect to the matters the subject of that assumption. We are not aware of any reason why any of the assumptions are incorrect.

Nora Creina Biodiversity Assessment & BushRAT Score

1 SUMMARY TABLE

Size (ha)	248.8	Management Category (or categories) (¹ maintain, improve, restore)	Maintain / improve
List particular features of the property (e.g. watercourse, wetland, rock outcrops, revegetation areas, prolific natural regeneration); important landscape attributes (e.g. joins two large remnants, adjacent a reserve); summarise ² plant species diversity & extent of weed invasion; comment on scores.	<p>The site consists of complex dune systems, with dune swales, swales with underlying fresh water, large dune crests both perpendicular and parallel to the ocean, dune plateaus (on large consolidated dunes) and wetlands fringing farmland. There are also patches of exposed limestone with shallow sand which naturally occur due to wind scars, where specialist species such as <i>Austrostipa echinata</i> and <i>Leucophyta brownii</i> are re-colonising. See Vegetation Association 7</p> <p>The property is also adjacent to Little Dip Conservation Park and consists of similar vegetation associations, but lacks the Coastal Mallee association commonly found in the park. There are three main wetland areas with brackish water with a mix of freshwater plants such as <i>Gahnia trifida</i> (Cutting Grass), <i>Leptospermum lanigerum</i> (Silky Tea Tree) and <i>Melaleuca lanceolata</i> (Dryland Tea Tree). These wetland attributes could potentially provide habitat for a variety of threatened fauna species.</p> <p>Flora species diversity is high to very high when compared to the benchmark community <i>SE 7.2 - Coastal Dune Shrublands</i>, with 95 species recorded at the time of the survey. There are sections of dunes which have had major blowouts in the past, but are continuing to regenerate well. There were 41 weed species recorded, however they were in relatively low cover throughout all vegetation associations.</p> <p>There are some minor weed incursions of the highly invasive coastal dune weed <i>Ehrharta villosa</i> (Pyp Grass), but they are restricted to the edges of the tracks.</p> <p>Area 1 scored relatively low total biodiversity score and includes sections where blowouts and disturbance from old 4WD tracks occur.</p> <p>Area 2, 5, 6, 7 scored relatively high unit biodiversity scores and in particular area 2 because it supports the nationally endangered <i>Caladenia richardsiorum</i> (Little Dip Spider-orchid).</p> <p>Area 8 scored a relatively high total biodiversity score for the <i>SE 6.6 - Brackish to Saline Tall Shrublands and Low Open Forest</i> and has a good cover of <i>Gahnia trifida</i> (Cutting Grass), a threatened plant community.</p> <p>Each site was naturally treeless, and overall the native to exotic biomass ratios were very high. Very minor grazing was noted on the property.</p>		
Topographic/landform description (from Laut, P. et al., 1977), and remnancy	Beachport Environmental Association (1.1.1) is described as 'A coastal dune system with an active foredune and occasional blowouts. The sand supply comes mainly from the present beach. Older consolidated dunes discontinuously underlie the active foredune, and where these are exposed along the shore, low cliffs have developed. Intermittent swales separate the inland system from the main foredune. Coastal heath occurs throughout, with rushes in		

¹ Clarke, I. Stokes, Z. and Wallace, R. 2010, Habitat Restoration Planning Guide for Natural Resource Managers, DENR, Adelaide.

² You can include plant species from outside of your quadrats in this count as long as you make it clear in the text that the figure includes them.

		<p>the swales. Most of the land is used for conservation.</p> <p>Recreation is important where access roads reach the coast, particularly in the vicinity of Beachport and Grey. Local headlands provide panoramic views of the ocean and coastline and high dunes also provide panoramic views over adjacent inland units. Within the association, local enclosed and detailed views occur within the dune complex.'</p> <p>The Remnancy of vegetation within this Environmental Association is 43%. The property links up with other remnant vegetation of varying quality along the coast with Little Dip Conservation Park to the north and a privately owned Heritage Agreement to the south.</p>						
Conservation significance		<p>The Scanlon property comprises 8 Vegetation Associations, 1 of which is considered to be of state conservation significance.</p> <p>The Scanlon property is providing habitat for at least 1 flora species of national significance and 4 flora species of state significance. It is expected that more species would be found by surveying the swamps more intensively in Summer and Autumn. It is possible that <i>Glycine latrobeana</i> (Clover Glycine), Vulnerable in SA, could be present on the property. A population of the nationally Endangered <i>Caladenia richardsiorum</i> (Little Dip Spider-orchid) were found on the property in area 2 and there are potentially more to be found.</p> <p>The vegetation provides habitat for at least 1 fauna species of national significance, the nationally Critically Endangered <i>Neophema chrysogaster</i> (Orange-bellied Parrot), and up to 14 fauna species of state significance. The number of fauna species likely to be utilising this property for habitat is difficult to determine based on existing database searches and records. There is a lack of previously surveyed fauna sites both on the property and in surrounding areas.</p>						
Vegetation Association identified on site (refer to map)	Assigned "Benchmark" Vegetation Community (as per BCM)	Is the Benchmark Community the desired 'goal state'? Y/N (refer to 2.7)	Size (ha)	Vegetation Condition Score	Conservation Significance Score	Landscape Context Score	Unit Biodiversity Score	Total Biodiversity Score
A1	SE 7.2 - Coastal Dune Shrublands	Y	7.87	51.66	8	12	71.66	564
A2	SE 7.2 - Coastal Dune Shrublands	Y	27.98	57.81	13	13	83.81	2345
A3	SE 7.2 - Coastal Dune Shrublands	Y	10.09	55.35	9	12	76.35	770.4
A4	SE 7.2 - Coastal Dune Shrublands	Y	7.76	60.27	5	12	77.27	599.6
A5	SE 7.2 - Coastal Dune Shrublands	Y	158.36	57.81	11	12	80.81	12797

A6	SE 7.2 - Coastal Dune Shrublands	Y	9.36	67.65	6	12	85.65	801.7
A7	SE 7.2 - Coastal Dune Shrublands	Y	4.76	61.5	11	13	85.5	407
A8	SE 6.6 - Brackish to Saline Tall	Y	22.7	65.19	25	11	101.2	2297
Totals			248.8				³ Average score per ha 73	Total Reserve Score 18169.3

³ Weighted average = Total Reserve Score / Total remnant size

2 VEGETATION ASSOCIATIONS

Nora Creina – Area 1

Name of site: Area 1

GPS Location: 395345, 5872742

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Ozothamnus turbinata*, *Olearia axillaris* Coastal Shrubland. This area is Frontline Coastal Crown Land. Some areas of blowouts and past 4WD disturbance have reduced the intactness, however species diversity is still good and vegetation provides suitable habitat for bird species.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ⁴ BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
None					
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
<i>Thinornis rubricollis rubricollis</i>	Hooded Plover	N	Y	V	
Vegetation Association				Conservation status	
None				AUS	SA

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region

CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance⁵.

N (plants) =Common: not of particular importance⁵.

T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

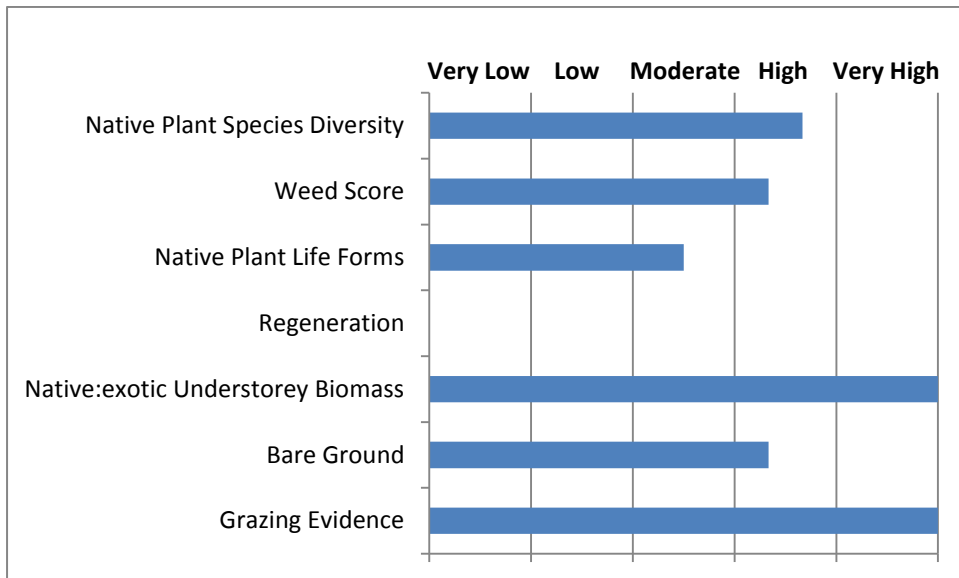
Q (plants) =Not yet assessed but flagged as being of possible significance.

⁴ Biological Databases of South Australia, DEWNR, Adelaide.

⁵ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000.* Department for Environment & Heritage, South Australia.

⁶ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions.* July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:



Site photograph:



Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance⁷

*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Apium prostratum</i>	Native Celery			
<i>Carpobrotus rossii</i>	Native Pigface			
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard			
<i>Comesperma volubile</i>	Love Creeper			
<i>Crassula colorata</i> var.	Dense Crassula			
<i>Exocarpos syrticola</i>	Coast Cherry			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Leucopogon parviflorus</i>	Coast Beard-heath			
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			
<i>Ozothamnus turbinatus</i>	Coast Bush-everlasting			U
<i>Pelargonium australe</i>	Australian Pelargonium			
<i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme Riceflower			
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			
<i>Senecio pinnatifolius</i>	Variable Groundsel			
<i>Spinifex hirsutus</i>	Rolling Spinifex			
<i>Stackhousia spathulata</i>	Coast Candles			N
<i>Tetragonia implexicoma</i>	Bower Spinach			
<i>Threlkeldia diffusa</i>	Coast Bonefruit			
* <i>Ammophila arenaria</i>	Marram Grass			
* <i>Avellinia michelii</i>	Avellinia			
* <i>Bromus diandrus</i>	Great Brome			
* <i>Euphorbia paralias</i>	Sea Spurge			
* <i>Lagurus ovatus</i>	Hare's Tail Grass			
* <i>Reichardia tingitana</i>	False Sowthistle			
* <i>Senecio elegans</i>	Purple Groundsel			
* <i>Sonchus oleraceus</i>	Common Sow-thistle			
* <i>Vulpia</i> sp.	Fescue			

⁷ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

BushRAT score sheet:

NVBMU Biodiversity Rapid Assessment Summary Scoresheet			
SITE: Nora Creina, Area 1		RECORDER: BM, PB, AA	DATE: 21-22/10/2014
DESCRIPTION: Ozothamnus turbinata, Olearia axillaris Coastal Shrubland. Frontline Coastal. Crown Land		BCM CODE: SE 7.2 - Coastal Dune Shrublands	
VEGETATION CONDITION SCORE (max.in)	score	LANDSCAPE CONTEXT SCORE	score
Native Plant Species Diversity (15)	11	2 pts if site is the only substantial connection between 2 or more remnants ¹	
Weed Score (15)	10	>20 ha, 1 pt if site is degraded (scattered trees in part, fragmented etc)	0
Native Plant Life Forms (10)	5	Site Shape Score	
Regeneration (8)	0	3 pts if Cleared perimeter:Area (km/km ²)<6,	
Native:exotic Understorey Biomass (10)	10	2 pts if P:A 6 to<12, 1pt if P:A 12 to <18	3
Bare Ground (3)	2	Size of remnant¹ patch (incl. native veg on adjacent properties) score	
Tree Health (5)	0	Patch size less than 2 ha 0 pts	
Tree Hollows (5)	0	Patch size 2-5 ha 1 pt	
Fallen timber (5)	0	Patch size 5-10 ha 2 pts	
Grazing Evidence (4)	4	Patch size 10-20 ha 3 pts	
TOTAL (ADD UP ALL POINTS)	42	Patch size 20-100 ha 4 pts	
If community is naturally treeless x TOTAL by 1.23	51.66	Patch size 100-500 ha 5 pts	
If community is not benchmarked for regen x 1.11		Patch size >500 ha 6 pts	6
ADJUSTED TOTAL SCORE	51.66	Distance to remnant area of more than 50 hectares score	
CONSERVATION SIGNIFICANCE SCORE:	score	>3km 0 pts	
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E ecosystem/ecological	0	1-3km 1 pt	
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E plant species present ² .	0	<1km 2 pts	
1 pt for each State-R, 2 pts for each State-V, 3 pts for each State-E or Nationally-V, 4 pts for each Nationally-E fauna species for which suitable habitat is present. Double points for a sighting. ³	7	contiguous 3 pts	3
% native vegetation remaining in IBRA Assoc. 0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts; >10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts	1	LANDSCAPE CONTEXT SCORE	12
1 pt if Site contains a riparian zone,		Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the UNIT BIODIVERSITY SCORE	
2 pts if contains swamp/wetland (+/- riparian zone)	0		
CONSERVATION SIGNIFICANCE SCORE	8		
Total Biodiversity Score (UBS x size)			71.66
Cleared perimeter(m)	Size(ha)	P:A Ratio	
0	7.87	0.00	
Total no. native species	Adjust for Spring⁴	Environmental Association	
19		Beachport	
Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max.6)	Invasive Threat Category (max.5)	C x I
* <i>Ammophila arenaria</i>	1		3 3
* <i>Euphorbia paralias</i>	1		3 3
* <i>Lagurus ovatus</i>	1		2 2
* <i>Reichardia tingitana</i>	1		2 2
* <i>Senecio elegans</i>	1		2 2
		Total Cover x Threat Invasion	12

Nora Creina – Area 2

Name of site: Area 2

GPS Location: 395361, 5872788

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Acacia longifolia ssp. sophorae*, *Leucopogon parviflorus*, *Olearia axillaris* Closed Shrubland into swales, with open bare sand, possibly where sand has blown in from dune crest blowouts. There is substantial leaf litter underneath shrubs with some areas of good moss cover. Of interest is the presence of several clumps of *Triodia compacta* previously not recorded for the region.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ⁸ BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
<i>Caladenia richardsiorum</i>	Little Dip Spider-orchid	Y	Y	E	E
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
Vegetation Association				Conservation status	
				AUS	SA
None					

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region

CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance⁹.

N (plants) =Common: not of particular importance¹⁰.

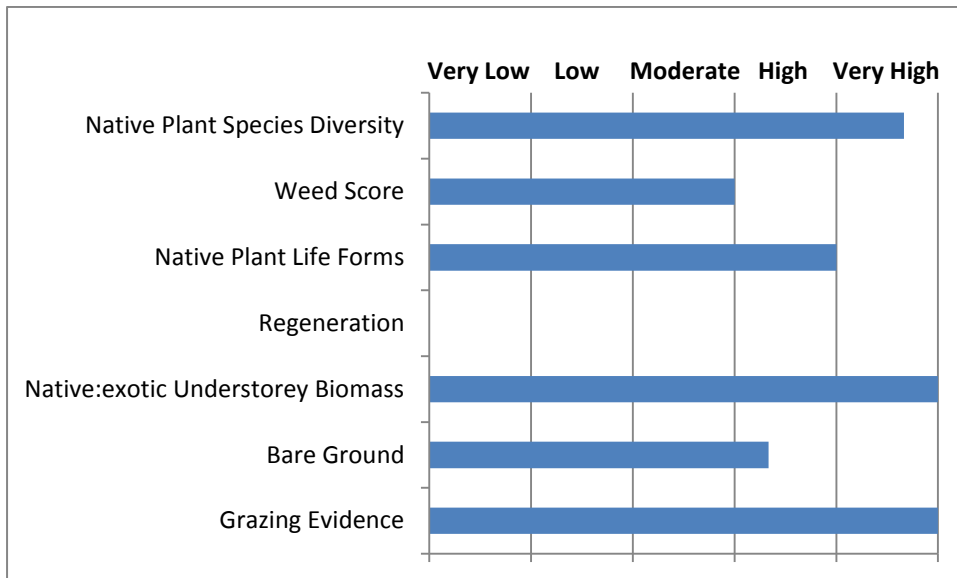
T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

Q (plants) =Not yet assessed but flagged as being of possible significance.

⁸ Biological Databases of South Australia, DEWNR, Adelaide.

⁹ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000*. Department for Environment & Heritage, South Australia.

¹⁰ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:**Site photograph:**

Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance¹¹

*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Alyxia buxifolia</i>	Sea Box			
<i>Caladenia richardsiorum</i>	Little Dip Spider-orchid	E	E	E
<i>Cassytha melantha</i>	Coarse Dodder-laurel			
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard			
<i>Crassula colligata</i>	Crassula			
<i>Daucus glochidiatus</i>	Native Carrot			
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			
<i>Dichondra repens</i>	Kidney Weed			
<i>Epilobium billardierianum</i> ssp.	Robust Willow-herb			
<i>Exocarpos syrticola</i>	Coast Cherry			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Hyalosperma demissum</i>	Dwarf Sunray			
<i>Lepidosperma gladiatum</i>	Coast Sword-sedge			
<i>Leucopogon parviflorus</i>	Coast Beard-heath			
<i>Logania minor</i>	Spoon-leaf Logania			R
<i>Lotus australis</i>	Austral Trefoil			
<i>Myoporum insulare</i>	Common Boobialla			
<i>Olearia axillaris</i>	Coast Daisy-bush			
<i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme Riceflower			
<i>Poa poiformis</i> var. <i>poiformis</i>	Coast Tussock-grass			N
<i>Pultenaea tenuifolia</i>	Narrow-leaf Bush-pea			
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			
<i>Senecio odoratus</i>	Scented Groundsel			
<i>Senecio pinnatifolius</i>	Variable Groundsel			
<i>Swainsona lessertiifolia</i>	Coast Swainson-pea			
<i>Tetragonia implexicoma</i>	Bower Spinach			
* <i>Ammophila arenaria</i>	Marram Grass			
* <i>Anagallis arvensis</i>	Pimpernel			
* <i>Bromus diandrus</i>	Great Brome			
* <i>Cyperus</i> sp.				
* <i>Euphorbia terracina</i>	False Caper			
* <i>Galium murale</i>	Small Bedstraw			

¹¹ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

* <i>Lagurus ovatus</i>	Hare's Tail Grass			
* <i>Leptospermum laevigatum</i>	Coast Tea-tree			
* <i>Picris</i> sp.				
* <i>Senecio elegans</i>	Purple Groundsel			
* <i>Vulpia</i> sp.	Fescue			

BushRAT score sheet:

NVBMU Biodiversity Rapid Assessment Summary			Scoresheet	
SITE: Nora Creina, Area 2			RECORDER: BM, PB, AA DATE: 21-22/10/2014	
DESCRIPTION: Acacia longifolia ssp. sophorae, Leucopogon parviflorus, Olearia axillaris Closed Shrubland			BCM CODE: SE 7.2 - Coastal Dune Shrublands	
VEGETATION CONDITION SCORE (max in		score	LANDSCAPE CONTEXT SCORE	
Native Plant Species Diversity (15)		14	2 pts if site is the only substantial	
Weed Score (15)		9	connection between 2 or more remnants ¹	
Native Plant Life Forms (10)		8	>20 ha, 1 pt if site is degraded	
Regeneration (8)		0	(scattered trees in part, fragmented etc)	
Native:exotic Understorey Biomass (10)		10	Site Shape Score	
Bare Ground (3)		2	3 pts if Cleared perimeter:Area (km/km ²)<6,	
Tree Health (5)		0	2 pts if P:A 6 to<12, 1pt if P:A 12 to <18	
Tree Hollows (5)		0	Size of remnant¹ patch (incl. native	
Fallen timber (5)		0	veg on adjacent properties) score	
Grazing Evidence (4)		4	Patch size less than 2 ha 0 pts	
TOTAL (ADD UP ALL POINTS)		47	Patch size 2-5 ha 1 pt	
If community is naturally treeless x TOTAL by 1.23		57.81	Patch size 5-10 ha 2 pts	
If community is not benchmarked for regen x 1.11			Patch size 10-20 ha 3 pts	
ADJUSTED TOTAL SCORE		57.81	Patch size 20-100 ha 4 pts	
			Patch size 100-500 ha 5 pts	
			Patch size >500 ha 6 pts	
CONSERVATION SIGNIFICANCE SCORE:		score	Distance to remnant area of more than	
2 pts for each State-R, 4 pts for each State-V,			50 hectares score	
6 pts for each State-E or Nationally-V, 8 pts for			>3km 0 pts	
each Nationally-E ecosystem/ecological		0	1-3km 1 pt	
2 pts for each State-R, 4 pts for each State-V,			<1km 2 pts	
6 pts for each State-E or Nationally-V, 8 pts for			contiguous 3 pts	
each Nationally-E plant species present ² .		8	LANDSCAPE CONTEXT SCORE	
1 pt for each State-R, 2 pts for each State-V,			13	
3 pts for each State-E or Nationally-V, 4 pts				
for each Nationally-E fauna species for which				
suitable habitat is present. Double points for a				
sighting. ³		4		
% native vegetation remaining in IBRA Assoc.				
0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts;				
>10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts		1		
1 pt if Site contains a riparian zone,				
2 pts if contains swamp/wetland (+/- riparian zone)		0		
CONSERVATION SIGNIFICANCE SCORE		13		
			Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the	
			UNIT BIODIVERSITY SCORE	
			83.81	
			Total Biodiversity Score (UBS x size)	
			2345	
Cleared perimeter(m)		Size(ha)	P:A Ratio	
0		27.98	0.00	
Total no. native species		Adjust for Spring⁴	Environmental Association	
27			Beachport	
Weed species (Top 5 Cover x Invasiveness, annuals in bold)		Cover (max.6)	Invasive Threat Category (max.5)	
*Ammophila arenaria		1	3	3
*Euphorbia terracina		1	3	3
*Lagurus ovatus		1	2	2
*Leptospermum laevigatum		1	3	3
*Senecio elegans		1	2	2
			Total Cover x Threat Invasion	
			13	

Nora Creina – Area 3

Name of site: Area 3

GPS Location: 395377, 5872819

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Olearia axillaris*, *Ozothamnus turbinatus* Open Shrubland. Tall dune slopes and crests. Minor dune blowouts were noted, possibly as a result of colonising *Ammophila arenaria* clumps causing a collapse due to a loss of dune structural stability.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ¹² BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
<i>Scaevola calendulacea</i>	Dune Fanflower	Y	Y		V
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
Vegetation Association				Conservation status	
				AUS	SA
None					

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region
CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance¹³.

N (plants) =Common: not of particular importance¹⁴.

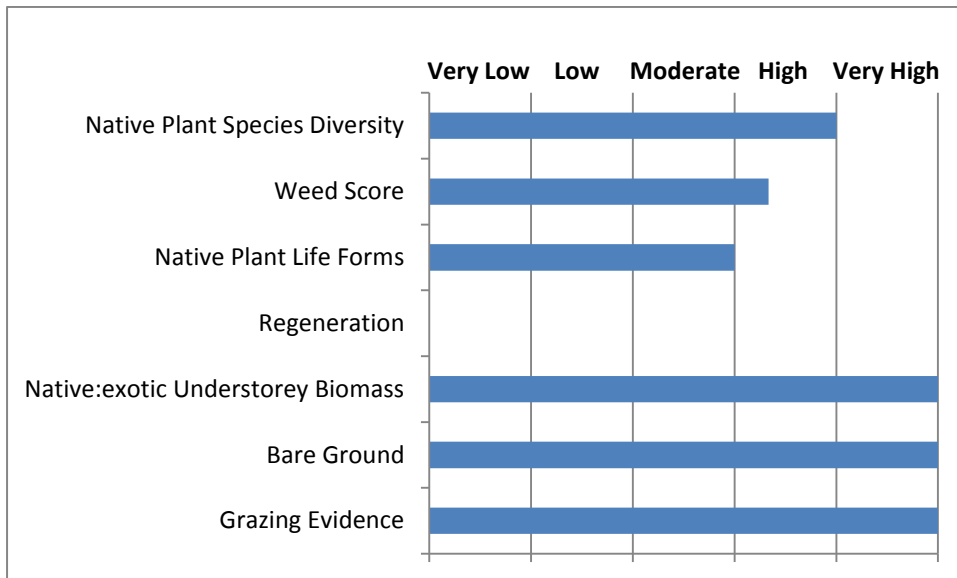
T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

Q (plants) =Not yet assessed but flagged as being of possible significance.

¹² Biological Databases of South Australia, DEWNR, Adelaide.

¹³ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000.* Department for Environment & Heritage, South Australia.

¹⁴ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions.* July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:**Site photograph:**

Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance¹⁵

*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Carpobrotus rossii</i>	Native Pigface			
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard			
<i>Crassula colligata</i>				
<i>Epilobium billardierianum</i> ssp.	Robust Willow-herb			
<i>Exocarpos syrticola</i>	Coast Cherry			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Geranium retrorsum</i>	Grassland Geranium			
<i>Leucopogon parviflorus</i>	Coast Beard-heath			
<i>Lotus australis</i>	Austral Trefoil			
<i>Myoporum insulare</i>	Common Boobialla			
<i>Olearia axillaris</i>	Coast Daisy-bush			
<i>Ozothamnus turbinatus</i>	Coast Bush-everlasting			U
<i>Pelargonium australe</i>	Australian Pelargonium			
<i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme Riceflower			
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			
<i>Scaevola calendulacea</i>	Dune Fanflower		V	V
<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>	Variable Groundsel			
<i>Stackhousia spathulata</i>	Coast Candles			N
<i>Swainsona lessertiiifolia</i>	Coast Swainson-pea			
<i>Tetragonia implexicoma</i>	Bower Spinach			
<i>Threlkeldia diffusa</i>	Coast Bonefruit			
<i>Triodia compacta</i> (New record for SE Region)	Spinifex			
* <i>Ammophila arenaria</i>	Marram Grass			
* <i>Catapodium rigidum</i>	Rigid Fescue			
* <i>Euphorbia terracina</i>	False Caper			
* <i>Lactuca saligna</i>	Willow-leaf Lettuce			
* <i>Lactuca serriola</i>	Prickly Lettuce			
* <i>Lagurus ovatus</i>	Hare's Tail Grass			
* <i>Senecio elegans</i>	Purple Groundsel			

¹⁵ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

BushRAT score sheet:

NVBMU Biodiversity Rapid Assessment Summary Scoresheet			
SITE: Nora Creina, Area 3		RECORDER: BM, PB, AA	DATE: 21-22/10/2014
DESCRIPTION: <i>Olearia axillaris</i> , <i>Ozothamnus turbinatus</i> Open Shrubland - Tall dune crests		BCM CODE: SE 7.2 - Coastal Dune Shrublands	
VEGETATION CONDITION SCORE (max.in)		LANDSCAPE CONTEXT SCORE	score
Native Plant Species Diversity (15)	12	2 pts if site is the only substantial	
Weed Score (15)	10	connection between 2 or more remnants ¹	
Native Plant Life Forms (10)	6	>20 ha, 1 pt if site is degraded	
Regeneration (8)	0	(scattered trees in part, fragmented etc)	0
Native:exotic Understorey Biomass (10)	10	Site Shape Score	
Bare Ground (3)	3	3 pts if Cleared perimeter:Area (km/km ²)<6,	
Tree Health (5)	0	2 pts if P:A 6 to<12, 1pt if P:A 12 to <18	3
Tree Hollows (5)	0	Size of remnant¹ patch (incl. native	
Fallen timber (5)	0	veg on adjacent properties) score	
Grazing Evidence (4)	4	Patch size less than 2 ha 0 pts	
TOTAL (ADD UP ALL POINTS)	45	Patch size 2-5 ha 1 pt	
If community is naturally treeless x TOTAL by 1.23	55.35	Patch size 5-10 ha 2 pts	
If community is not benchmarked for regen x 1.11		Patch size 10-20 ha 3 pts	
ADJUSTED TOTAL SCORE	55.35	Patch size 20-100 ha 4 pts	
		Patch size 100-500 ha 5 pts	
		Patch size >500 ha 6 pts	6
CONSERVATION SIGNIFICANCE SCORE:	score	Distance to remnant area of more than	
2 pts for each State-R, 4 pts for each State-V,		50 hectares score	
6 pts for each State-E or Nationally-V, 8 pts for		>3km 0 pts	
each Nationally-E ecosystem/ecological	0	1-3km 1 pt	
2 pts for each State-R, 4 pts for each State-V,		<1km 2 pts	
6 pts for each State-E or Nationally-V, 8 pts for		contiguous 3 pts	3
each Nationally-E plant species present ² .	4	LANDSCAPE CONTEXT SCORE	12
1 pt for each State-R, 2 pts for each State-V,		Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the UNIT BIODIVERSITY SCORE	
3 pts for each State-E or Nationally-V, 4 pts			
for each Nationally-E fauna species for which			
suitable habitat is present. Double points for a			
sighting. ³	4	Total Biodiversity Score (UBS x size)	770.4
% native vegetation remaining in IBRA Assoc.			
0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts;			
>10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts	1		
1 pt if Site contains a riparian zone,			
2 pts if contains swamp/wetland (+/- riparian zone)	0		
CONSERVATION SIGNIFICANCE SCORE	9		
Cleared perimeter(m)	Size(ha)	P:A Ratio	
0	10.09	0.00	
Total no. native species	Adjust for Spring⁴	Environmental Association	
23		Beachport	
Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max.6)	Invasive Threat Category (max.5)	C x I
* <i>Ammophila arenaria</i>	1		3 3
* <i>Euphorbia terracina</i>	1		3 3
* <i>Lactuca saligna</i>	1		2 2
* <i>Lactuca serriola</i>	1		2 2
* <i>Senecio elegans</i>	1		2 2
		Total Cover x Threat Invasion	12

Nora Creina – Area 4

Name of site: Area 4

GPS Location: 395663, 5872587

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Acacia longifolia ssp. sophorae* Tall Open Shrubland was a minor occurrence and was structurally similar to that of Areas 2 and 5. However this area was more open with a very high cover of the vines *Tetragonia implexicoma*, *Clematis microphylla* and *Cassytha pubescens*. There is a good amount of moss on the south-facing inter-dune slopes and under the shade of the shrubs.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ¹⁶ BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
None					
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
Vegetation Association				Conservation status	
None				AUS	SA

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region

CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance¹⁷.

N (plants) =Common: not of particular importance¹⁸.

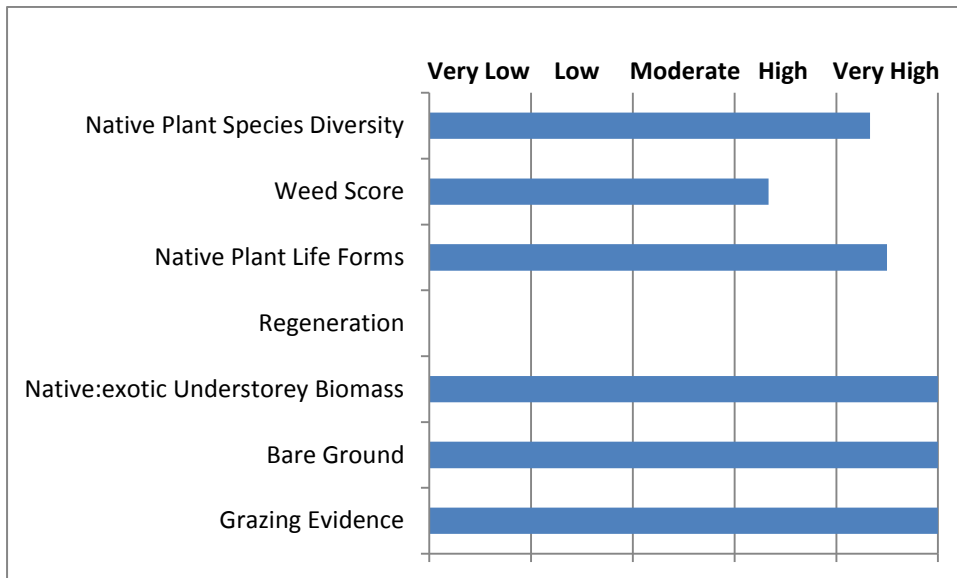
T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

Q (plants) =Not yet assessed but flagged as being of possible significance.

¹⁶ Biological Databases of South Australia, DEWNR, Adelaide.

¹⁷ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000.* Department for Environment & Heritage, South Australia.

¹⁸ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions.* July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:**Site photograph:**

Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance¹⁹

*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Acaena novae-zelandiae</i>	Biddy-biddy			
<i>Adriana quadripartita</i>	Coast Bitter-bush			
<i>Asperula conferta</i>	Common Woodruff			
<i>Baumea juncea</i>	Bare Twig-rush			
<i>Beyeria lechenaultii</i>	Pale Turpentine Bush			
<i>Carpobrotus rossii</i>	Native Pigface			
<i>Cassytha pubescens</i>	Downy Dodder-laurel			
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard			
<i>Comesperma volubile</i>	Love Creeper			
<i>Dichondra repens</i>	Kidney Weed			
<i>Exocarpos syrticola</i>	Coast Cherry			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Galium</i> sp.	Bedstraw			
<i>Juncus kraussii</i>	Sea Rush			
<i>Kunzea pomifera</i>	Muntries			
<i>Lepidosperma gladiatum</i>	Coast Sword-sedge			
<i>Leucopogon parviflorus</i>	Coast Beard-heath			
<i>Myoporum insulare</i>	Common Boobialla			
<i>Olearia axillaris</i>	Coast Daisy-bush			
<i>Pelargonium australe</i>	Australian Pelargonium			
<i>Pomaderris paniculosa</i> ssp. <i>paralia</i>	Coast Pomaderris			
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			
<i>Rhytidosperma</i> sp.	Wallaby-grass			
<i>Senecio biserratus</i>	Jagged Groundsel			U
* <i>Avena barbata</i>	Bearded Oat			
* <i>Euphorbia terracina</i>	False Caper			
* <i>Lactuca serriola</i>	Prickly Lettuce			
* <i>Lagurus ovatus</i>	Hare's Tail Grass			
* <i>Senecio elegans</i>	Purple Groundsel			
* <i>Cerastium glomeratum</i>	Common Mouse-ear Chickweed			
* <i>Stellaria pallida</i>	Lesser Starwort			

BushRAT score sheet:

¹⁹ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

NVBMU Biodiversity Rapid Assessment Summary Scoresheet			
SITE: Nora Creina, Area 4		RECORDER: BM, PB, AA DATE: 21-22/10/2014	
DESCRIPTION: Acacia longifolia ssp. sophorae Tall Shrubland		BCM CODE: SE 7.2 - Coastal Dune Shrublands	
VEGETATION CONDITION SCORE (max.in)		LANDSCAPE CONTEXT SCORE	
	score		score
Native Plant Species Diversity (15)	13	2 pts if site is the only substantial	
Weed Score (15)	10	connection between 2 or more remnants ¹	
Native Plant Life Forms (10)	9	>20 ha, 1 pt if site is degraded	
Regeneration (8)	0	(scattered trees in part, fragmented etc)	0
Native:exotic Understorey Biomass (10)	10	Site Shape Score	
Bare Ground (3)	3	3 pts if Cleared perimeter:Area (km/km ²)<6,	
Tree Health (5)	0	2 pts if P:A 6 to<12, 1pt if P:A 12 to <18	3
Tree Hollows (5)	0	Size of remnant¹ patch (incl. native	
Fallen timber (5)	0	veg on adjacent properties) score	
Grazing Evidence (4)	4	Patch size less than 2 ha 0 pts	
TOTAL (ADD UP ALL POINTS)	49	Patch size 2-5 ha 1 pt	
If community is naturally treeless x TOTAL by 1.23	60.27	Patch size 5-10 ha 2 pts	
If community is not benchmarked for regen x 1.11		Patch size 10-20 ha 3 pts	
ADJUSTED TOTAL SCORE	60.27	Patch size 20-100 ha 4 pts	
		Patch size 100-500 ha 5 pts	
CONSERVATION SIGNIFICANCE SCORE:	score	Patch size >500 ha 6 pts	6
2 pts for each State-R, 4 pts for each State-V,		Distance to remnant area of more than	
6 pts for each State-E or Nationally-V, 8 pts for		50 hectares score	
each Nationally-E ecosystem/ecological	0	>3km 0 pts	
2 pts for each State-R, 4 pts for each State-V,		1-3km 1 pt	
6 pts for each State-E or Nationally-V, 8 pts for		<1km 2 pts	
each Nationally-E plant species present ² .	0	contiguous 3 pts	3
1 pt for each State-R, 2 pts for each State-V,		LANDSCAPE CONTEXT SCORE	12
3 pts for each State-E or Nationally-V, 4 pts			
for each Nationally-E fauna species for which		Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the UNIT BIODIVERSITY SCORE	
suitable habitat is present. Double points for a			
sighting. ³	4		
% native vegetation remaining in IBRA Assoc.			
0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts;			
>10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts	1		
1 pt if Site contains a riparian zone,			
2 pts if contains swamp/wetland (+/- riparian zone)	0		
CONSERVATION SIGNIFICANCE SCORE	5	Total Biodiversity Score (UBS x size)	599.6
Cleared perimeter(m)	Size(ha)	P:A Ratio	
0	7.76	0.00	
Total no. native species	Adjust for Spring⁴	Environmental Association	
25		Beachport	
Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max.6)	Invasive Threat Category (max.5)	
		C x I	
* <i>Avena barbata</i>	1	2	2
* <i>Euphorbia terracina</i>	1	3	3
* <i>Lactuca serriola</i>	1	2	2
* <i>Lagurus ovatus</i>	1	2	2
* <i>Senecio elegans</i>	1	2	2
		Total Cover x Threat Invasion	
		11	

Nora Creina – Area 5

Name of site: Area 5

GPS Location: 396440, 5872265

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Acacia longifolia ssp. sophorae*, *Leucopogon parviflorus*
Closed Tall Shrubland. This association occurs in the deeper swales between taller dunes and has extremely high shrub canopy cover of up to 85% in some areas, with a ground cover dominated by matting plants and moss.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ²⁰ BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
<i>Wallabia bicolor</i>	Swamp Wallaby (sighted)	Y	Y		V
Vegetation Association				Conservation status	
None				AUS	SA

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region
CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance²¹.

N (plants) =Common: not of particular importance²².

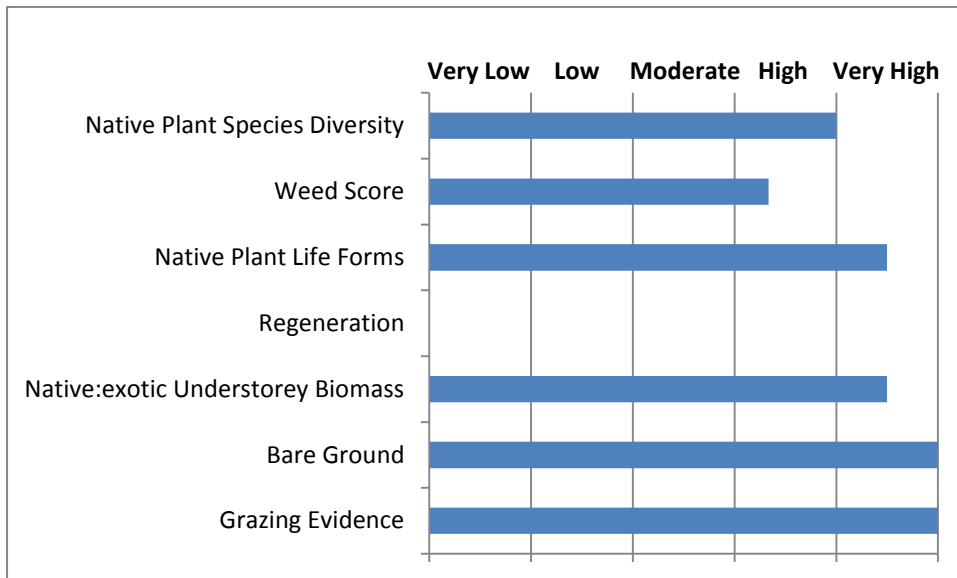
T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

Q (plants) =Not yet assessed but flagged as being of possible significance.

²⁰ Biological Databases of South Australia, DEWNR, Adelaide.

²¹ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000.* Department for Environment & Heritage, South Australia.

²² Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions.* July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:**Site photograph:**

Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance²³

*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia leiophylla</i>	Coast Golden Wattle			
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Allocasuarina verticillata</i>	Drooping Sheoak			
<i>Caladenia richardsiorum</i>	Little Dip Spider-orchid	E	E	E
<i>Carpobrotus rossii</i>	Native Pigface			
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard			
<i>Cynoglossum australe</i>	Australian Hound's-tongue			
<i>Daucus glochidiatus</i>	Native Carrot			
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			
<i>Dichondra repens</i>	Kidney Weed			
<i>Exocarpos syrticola</i>	Coast Cherry			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy Geranium			
<i>Kunzea pomifera</i>	Muntries			
<i>Leucopogon parviflorus</i>	Coast Beard-heath			
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			
<i>Olearia axillaris</i>	Coast Daisy-bush			
<i>Pelargonium australe</i>	Australian Pelargonium			
<i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme Riceflower			
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			
<i>Swainsona lessertiifolia</i>	Coast Swainson-pea			
<i>Tetragonia implexicoma</i>	Bower Spinach			
* <i>Bromus diandrus</i>	Great Brome			
* <i>Cirsium vulgare</i>	Spear Thistle			
* <i>Ehrharta longiflora</i>	Annual Veldt Grass			
* <i>Ehrharta villosa</i> var. <i>maxima</i>	Pyp Grass			
* <i>Euphorbia peplus</i>	Petty Spurge			
* <i>Euphorbia terracina</i>	False Caper			
* <i>Hypochaeris radicata</i>	Rough Cat's Ear			
* <i>Lagurus ovatus</i>	Hare's Tail Grass			
* <i>Lolium perenne</i>	Perennial Ryegrass			
* <i>Melilotus indicus</i>	King Island Melilot			
* <i>Plantago lanceolata</i> var.	Ribwort			
* <i>Senecio elegans</i>	Purple Groundsel			

²³ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

**Sonchus oleraceus*

Common Sow-thistle

BushRAT score sheet:

SITE: Nora Creina, Area 5		RECORDER: BM, PB, AA	DATE: 21-22/10/2014
DESCRIPTION: <i>Acacia longifolia</i> ssp. <i>sophorae</i> , <i>Leucopogon parviflorus</i> Closed Shrubland		BCM CODE: SE 7.2 - Coastal Dune Shrublands	
VEGETATION CONDITION SCORE (max. in)		LANDSCAPE CONTEXT SCORE	
score			score
Native Plant Species Diversity (15)	12	2 pts if site is the only substantial connection between 2 or more remnants ¹	
Weed Score (15)	10	>20 ha, 1 pt if site is degraded (scattered trees in part, fragmented etc)	
Native Plant Life Forms (10)	9	0	
Regeneration (8)	0	Site Shape Score	
Native:exotic Understorey Biomass (10)	9	3 pts if Cleared perimeter:Area (km/km ²)<6,	
Bare Ground (3)	3	2 pts if P:A 6 to<12, 1pt if P:A 12 to <18	
Tree Health (5)	0	Size of remnant¹ patch (incl. native veg on adjacent properties) score	
Tree Hollows (5)	0	Patch size less than 2 ha 0 pts	
Fallen timber (5)	0	Patch size 2-5 ha 1 pt	
Grazing Evidence (4)	4	Patch size 5-10 ha 2 pts	
TOTAL (ADD UP ALL POINTS)	47	Patch size 10-20 ha 3 pts	
If community is naturally treeless x TOTAL by 1.23	57.81	Patch size 20-100 ha 4 pts	
If community is not benchmarked for regen x 1.11		Patch size 100-500 ha 5 pts	
ADJUSTED TOTAL SCORE	57.81	Patch size >500 ha 6 pts	
		6	
CONSERVATION SIGNIFICANCE SCORE:	score	Distance to remnant area of more than 50 hectares score	
2 pts for each State-R, 4 pts for each State-V,		>3km 0 pts	
6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E ecosystem/ecological	0	1-3km 1 pt	
2 pts for each State-R, 4 pts for each State-V,		<1km 2 pts	
6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E plant species present ² .	0	contiguous 3 pts	
1 pt for each State-R, 2 pts for each State-V,		LANDSCAPE CONTEXT SCORE	
3 pts for each State-E or Nationally-V, 4 pts for each Nationally-E fauna species for which suitable habitat is present. Double points for a sighting. ³	10	12	
% native vegetation remaining in IBRA Assoc. 0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts; >10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts	1	Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the UNIT BIODIVERSITY SCORE	
1 pt if Site contains a riparian zone,			
2 pts if contains swamp/wetland (+/- riparian zone)	0		
CONSERVATION SIGNIFICANCE SCORE	11		
		80.81	
		Total Biodiversity Score (UBS x size)	
		12797	
Cleared perimeter(m)	Size(ha)	P:A Ratio	
1650	158.36	1.04	
Total no. native species	Adjust for Spring⁴	Environmental Association	
22		Beachport	
Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	
* <i>Cirsium vulgare</i>	1	2	2
* <i>Ehrharta longiflora</i>	1	2	2
* <i>Ehrharta villosa</i> var. <i>maxima</i>	1	3	3
* <i>Euphorbia terracina</i>	1	3	3
* <i>Lagurus ovatus</i>	1	2	2
		Total Cover x Threat Invasion	
		12	

Nora Creina – Area 6

Name of site: Area 6

GPS Location: 396025, 5872221

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Acacia longifolia ssp. sophorae* Tall Open Shrubland over sedges and grasses. This area has some patches of planted introduced pine trees and evidence of past grazing and minor clearance from previous agricultural land use. However species such as *Leucopogon parviflorus*, *Lomandra micrantha*, *Kunzea pomifera*, *Acacia longifolia ssp. sophorae* etc are regenerating very well in this area. There were also dense patches of *Dianella spp.* in shallow drainage areas, creating dense mats ideal for habitat for native mammals such as Swamp Rats and Bush Rats.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ²⁴ BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
<i>Picris squarrosa</i>	Squat Picris	Y	Y		R
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
Vegetation Association				Conservation status	
				AUS	SA
None					

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region

CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance²⁵.

N (plants) =Common: not of particular importance²⁶.

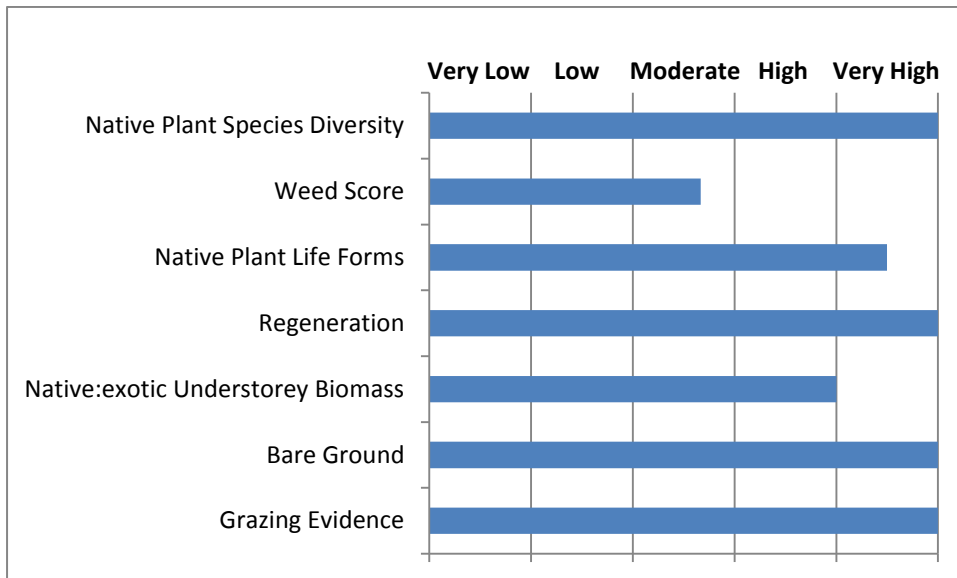
T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

Q (plants) =Not yet assessed but flagged as being of possible significance.

²⁴ Biological Databases of South Australia, DEWNR, Adelaide.

²⁵ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000.* Department for Environment & Heritage, South Australia.

²⁶ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions.* July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:**Site photograph:**

Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance²⁷

*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Acaena novae-zelandiae</i>	Biddy-biddy			
<i>Acrotriche affinis</i>	Ridged Ground-berry			
<i>Adriana quadripartita</i>	Coast Bitter-bush			
<i>Allocasuarina verticillata</i>	Drooping Sheoak			
<i>Anthosachne scabra</i>	Native Wheat-grass			
<i>Austrostipa eremophila</i>	Rusty Spear-grass			R
<i>Austrostipa flavescens</i>	Coast Spear-grass			
<i>Austrostipa puberula</i>	Fine-hairy Spear-grass			
<i>Austrostipa scabra</i> ssp. <i>falcata</i>	Slender Spear-grass			
<i>Baumea juncea</i>	Bare Twig-rush			
<i>Beyeria lechenaultii</i>	Pale Turpentine Bush			
<i>Billardiera</i> sp.	Apple-berry			
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria			
<i>Carex breviculmis</i>	Short-stem Sedge			U
<i>Carpobrotus rossii</i>	Native Pigface			
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard			
<i>Convolvulus remotus</i>	Grassy Bindweed			
<i>Cynoglossum australe</i>	Australian Hound's-tongue			
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily			
<i>Dichondra repens</i>	Kidney Weed			
<i>Exocarpos syrticola</i>	Coast Cherry			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy Geranium			
<i>Geranium retrorsum</i>	Grassland Geranium			
<i>Hemarthria uncinata</i> var. <i>uncinata</i>	Mat Grass			
<i>Hibbertia sericea</i>	Silky Guinea-flower			
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort			
<i>Imperata cylindrica</i>	Blady Grass			N
<i>Juncus kraussii</i>	Sea Rush			
<i>Kennedia prostrata</i>	Scarlet Runner			
<i>Kunzea pomifera</i>	Muntries			
<i>Leucopogon parviflorus</i>	Coast Beard-heath			
<i>Lomandra micrantha</i> ssp.	Small-flower Mat-rush			

²⁷ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Rice-grass			N
<i>Muehlenbeckia adpressa</i>	Climbing Lignum			
<i>Olearia axillaris</i>	Coast Daisy-bush			
<i>Oxalis perennans</i>	Native Sorrel			
<i>Pelargonium australe</i>	Australian Pelargonium			
<i>Picris squarrosa</i>	Squat Picris		R	E
<i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme Riceflower			
<i>Poa labillardieri</i> var. <i>labillardieri</i>	Common Tussock-grass			
<i>Poa sieberiana</i> var. <i>sieberiana</i>	Tussock Grass			
<i>Pomaderris paniculosa</i> ssp. <i>paralia</i>	Coast Pomaderris			
<i>Rhytidosperra</i> sp.	Wallaby-grass			
<i>Senecio</i> sp.				
<i>Tetragonia implexicoma</i>	Bower Spinach			
<i>Themeda triandra</i>	Kangaroo Grass			N
* <i>Anagallis arvensis</i>	Pimpernel			
* <i>Asphodelus fistulosus</i>	Onion Weed			
* <i>Avena barbata</i>	Bearded Oat			
* <i>Briza minor</i>	Lesser Quaking-grass			
* <i>Bromus diandrus</i>	Great Brome			
* <i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome			
* <i>Bromus madritensis</i>	Compact Brome			
* <i>Catapodium rigidum</i>	Rigid Fescue			
* <i>Cirsium vulgare</i>	Spear Thistle			
* <i>Conyza bonariensis</i>	Flax-leaf Fleabane			
* <i>Cypress</i> sp.				
* <i>Dactylis glomerata</i>	Cocksfoot			
* <i>Euphorbia terracina</i>	False Caper			
* <i>Galium aparine</i>	Cleavers			
* <i>Hypochaeris radicata</i>	Rough Cat's Ear			
* <i>Lagurus ovatus</i>	Hare's Tail Grass			
* <i>Lolium perenne</i>	Perennial Ryegrass			
* <i>Phalaris aquatica</i>	Phalaris			
* <i>Pinus halepensis</i>	Aleppo Pine			
* <i>Plantago lanceolata</i> var.	Ribwort			
* <i>Raphanus raphanistrum</i>	Wild Radish			
* <i>Salvia verbenaca</i> var.	Wild Sage			
* <i>Scabiosa atropurpurea</i>	Pincushion			
* <i>Senecio elegans</i>	Purple Groundsel			
* <i>Stellaria pallida</i>	Lesser Starwort			
* <i>Trifolium</i> sp.	Clover			

BushRAT score sheet:

NVBMU Biodiversity Rapid Assessment Summary			Scoresheet	
SITE: Nora Creina, Area 6			RECORDER: BM, PB, AA DATE: 21-22/10/2014	
DESCRIPTION: Acacia longifolia ssp. sophorae Tall Open Shrubland over sedges and grasses			BCM CODE: SE 7.2 - Coastal Dune Shrublands	
VEGETATION CONDITION SCORE (max.in)		score	LANDSCAPE CONTEXT SCORE	
Native Plant Species Diversity (15)		15	2 pts if site is the only substantial connection between 2 or more remnants ¹	
Weed Score (15)		8	>20 ha, 1 pt if site is degraded (scattered trees in part, fragmented etc)	
Native Plant Life Forms (10)		9	Site Shape Score	
Regeneration (8)		8	3 pts if Cleared perimeter:Area (km/km ²)<6, 2 pts if P:A 6 to<12, 1pt if P:A 12 to <18	
Native:exotic Understorey Biomass (10)		8	Size of remnant ¹ patch (incl. native veg on adjacent properties) score	
Bare Ground (3)		3	Patch size less than 2 ha 0 pts	
Tree Health (5)		0	Patch size 2-5 ha 1 pt	
Tree Hollows (5)		0	Patch size 5-10 ha 2 pts	
Fallen timber (5)		0	Patch size 10-20 ha 3 pts	
Grazing Evidence (4)		4	Patch size 20-100 ha 4 pts	
TOTAL (ADD UP ALL POINTS)		55	Patch size 100-500 ha 5 pts	
If community is naturally treeless x TOTAL by 1.23		67.65	Patch size >500 ha 6 pts	
If community is not benchmarked for regen x 1.11			Distance to remnant area of more than 50 hectares score	
ADJUSTED TOTAL SCORE		67.65	>3km 0 pts	
CONSERVATION SIGNIFICANCE SCORE:		score	1-3km 1 pt	
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E ecosystem/ecological		0	<1km 2 pts	
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E plant species present ² .		1	contiguous 3 pts	
1 pt for each State-R, 2 pts for each State-V, 3 pts for each State-E or Nationally-V, 4 pts for each Nationally-E fauna species for which suitable habitat is present. Double points for a sighting. ³		4	LANDSCAPE CONTEXT SCORE	
% native vegetation remaining in IBRA Assoc. 0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts; >10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts		1	Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the	
1 pt if Site contains a riparian zone, 2 pts if contains swamp/wetland (+/- riparian zone)		0	UNIT BIODIVERSITY SCORE	
CONSERVATION SIGNIFICANCE SCORE		6	85.65	
			Total Biodiversity Score (UBS x size)	
			801.7	
Cleared perimeter(m)	Size(ha)	P:A Ratio		
0	9.36	0.00		
Total no. native species	Adjust for Spring⁴	Environmental Association		
49		Beachport		
Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max.6)	Invasive Threat Category (max.5)	C	x I
* <i>Euphorbia terracina</i>	1		3	3
* <i>Lagurus ovatus</i>	1		2	2
* <i>Phalaris aquatica</i>	1		3	3
* <i>Pinus halepensis</i>	2		3	6
* <i>Scabiosa atropurpurea</i>	1		2	2
Total Cover x Threat Invasion			16	

Nora Creina – Area 7

Name of site: Area 7

GPS Location: 395907, 5871950

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Leucophyta brownii* Open Shrubland on patches of exposed limestone with shallow sand to light reddish clay which naturally occur due to wind scars. Specialist species such as *Austrostipa echinata* and *Leucophyta brownii* are naturally recolonising. Vegetation is slowly regenerating through this site, but will remain naturally open due to the existing geological features unless sand is continually blown in.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ²⁸ BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
<i>Austrostipa echinata</i>	Spiny Spear-grass	Y			R
<i>Scaevola calendulacea</i>	Dune Fanflower	Y			V
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
Vegetation Association				Conservation status	
				AUS	SA
None					

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region

CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance²⁹.

N (plants) =Common: not of particular importance³⁰.

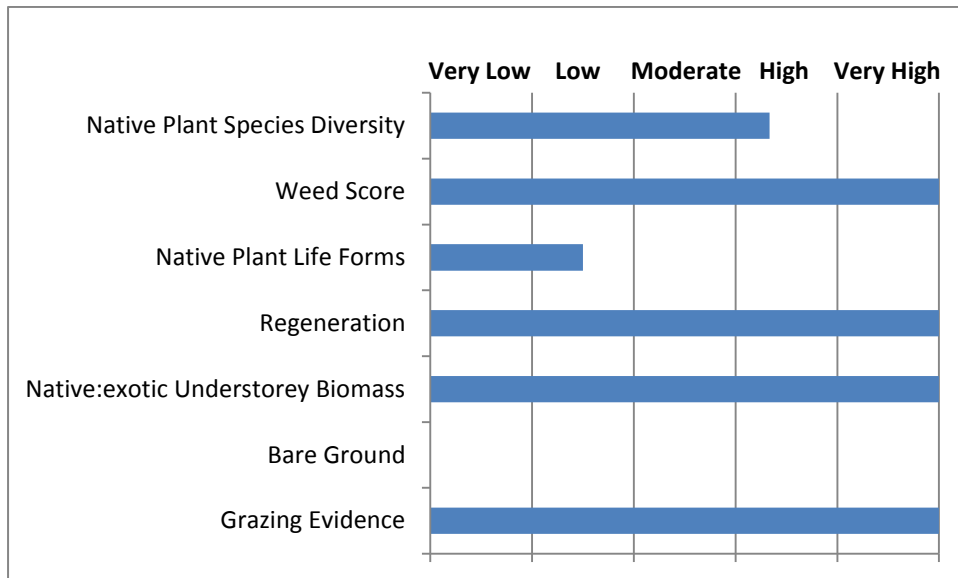
T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

Q (plants) =Not yet assessed but flagged as being of possible significance.

²⁸ Biological Databases of South Australia, DEWNR, Adelaide.

²⁹ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000.* Department for Environment & Heritage, South Australia.

³⁰ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions.* July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:**Site photograph:**

Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance³¹

*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Apium prostratum</i>	Native Celery			
<i>Austrostipa echinata</i>	Spiny Spear-grass		R	T
<i>Carpobrotus rossii</i>	Native Pigface			
<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Kennedia prostrata</i>	Scarlet Runner			
<i>Kunzea pomifera</i>	Muntries			
<i>Leucophyta brownii</i>	Coast Cushion Bush			
<i>Leucopogon parviflorus</i>	Coast Beard-heath			
<i>Olearia axillaris</i>	Coast Daisy-bush			
<i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme Riceflower			
<i>Pultenaea tenuifolia</i>	Narrow-leaf Bush-pea			
<i>Scaevola calendulacea</i>	Dune Fanflower		V	V
<i>Senecio pinnatifolius</i> ssp.	Variable Groundsel			
<i>Stackhousia spathulata</i>	Coast Candles			N
* <i>Ehrharta villosa</i> var. <i>maxima</i>	Pyp Grass			

³¹ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

BushRAT score sheet:

NVBMU Biodiversity Rapid Assessment Summary			Scoresheet	
SITE: Nora Creina, Area 7			RECORDER: BM, PB, AA	DATE: 21-22/10/2014
DESCRIPTION: Leucophyta brownii Open Shrubland Blowout sites with exposed limestone and regeneration			BCM CODE: SE 7.2 - Coastal Dune Shrublands	
VEGETATION CONDITION SCORE (max in	score		LANDSCAPE CONTEXT SCORE	score
Native Plant Species Diversity (15)	10		2 pts if site is the only substantial	
Weed Score (15)	15		connection between 2 or more remnants ¹	
Native Plant Life Forms (10)	3		>20 ha, 1 pt if site is degraded	
Regeneration (8)	8		(scattered trees in part, fragmented etc)	1
Native:exotic Understorey Biomass (10)	10		Site Shape Score	
Bare Ground (3)	0		3 pts if Cleared perimeter:Area (km/km ²)<6,	
Tree Health (5)	0		2 pts if P:A 6 to<12, 1pt if P:A 12 to <18	3
Tree Hollows (5)	0		Size of remnant¹ patch (incl. native	
Fallen timber (5)	0		veg on adjacent properties) score	
Grazing Evidence (4)	4		Patch size less than 2 ha 0 pts	
TOTAL (ADD UP ALL POINTS)	50		Patch size 2-5 ha 1 pt	
If community is naturally treeless xTOTAL by 1.23	61.5		Patch size 5-10 ha 2 pts	
If community is not benchmarked for regen x 1.11			Patch size 10-20 ha 3 pts	
ADJUSTED TOTAL SCORE	61.5		Patch size 20-100 ha 4 pts	
			Patch size 100-500 ha 5 pts	
			Patch size >500 ha 6 pts	6
CONSERVATION SIGNIFICANCE SCORE:	score		Distance to remnant area of more than	
2 pts for each State-R, 4 pts for each State-V,			50 hectares score	
6 pts for each State-E or Nationally-V, 8 pts for			>3km 0 pts	
each Nationally-E ecosystem/ecological	0		1-3km 1 pt	
2 pts for each State-R, 4 pts for each State-V,			<1km 2 pts	
6 pts for each State-E or Nationally-V, 8 pts for			contiguous 3 pts	3
each Nationally-E plant species present ² .	6		LANDSCAPE CONTEXT SCORE	13
1 pt for each State-R, 2 pts for each State-V,			Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the UNIT BIODIVERSITY SCORE	
3 pts for each State-E or Nationally-V, 4 pts				
for each Nationally-E fauna species for which				
suitable habitat is present. Double points for a				
sighting. ³	4			
% native vegetation remaining in IBRA Assoc.				
0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts;				
>10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts	1			
1 pt if Site contains a riparian zone,				
2 pts if contains swamp/wetland (+/- riparian zone)	0			85.5
CONSERVATION SIGNIFICANCE SCORE	11		Total Biodiversity Score (UBS x size)	407
Cleared perimeter(m)	Size(ha)	P:A Ratio		
0	4.76	0.00		
Total no. native species	Adjust for Spring⁴	Environmental Association		
16		Beachport		
Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max.6)	Invasive Threat Category (max.5)	C x I	
* <i>Ehrharta villosa var. maxima</i>	1		3	3
		#REF!		#REF!
		#REF!		#REF!
		#REF!		#REF!
		#REF!		#REF!
		Total Cover x Threat Invasion		3

Nora Creina – Area 8

Name of site: Area 8

GPS Location: 396338, 5872575

IBRA Association: Beachport

% Remnant Vegetation in IBRA Association: 43%

Description of Vegetation Association: *Gahnia trifida* Sedgeland, with patchy *Melaleuca lanceolata* and *Leptospermum lanigerum* shrubland. In several smaller lakes there are some low samphire species which indicate higher salinity levels, but the main lakes have species such as the *Leptospermum lanigerum* and *Gahnia trifida* which indicate that there is still fresh water feeding into the system. The density of *Gahnia trifida* also provides very suitable habitat for Swamp Antechinus and Swamp Rats.

Conservation Significance Data:

Plant species	Common Name	Recorded during survey (Y)	Recent ³² BDBSA data/ other source (Y)	Conservation status	
				AUS	SA
<i>Olearia passerinoides ssp. glutescens</i>	Sticky Daisy-bush	Y			R
Fauna species	Common Name	Recorded during survey (Y)	Suitable habitat & /or recent BDBSA data (Y)	Conservation status	
				AUS	SA
<i>Antechinus minimus</i>	Swamp Antechinus	N	Y		E
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	N	Y	CE	E
<i>Rattus lutreolus</i>	Swamp Rat	N	Y		R
Vegetation Association				Conservation status	
				AUS	SA
<i>Gahnia trifida</i> Sedgeland					E
<i>Leptospermum lanigerum</i> Closed Shrubland in non-saline wetlands					E

AUS=Australia SA=South Australia SE = South East Botanical Region SE = South East Bird Region

CE=Critically Endangered:

E=Endangered: rare and in danger of disappearing from the wild in the short term.

V=Vulnerable: rare and in danger of disappearing from the wild in the long term.

R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

K=status uncertain, but considered likely to be either rare, vulnerable or endangered.

U (birds) =Uncommon: declining and inadequately conserved, but not yet rare or vulnerable.

U (plants) =Uncommon: less common species of interest but not rare enough to warrant special protective measures.

C (birds) =Common: not of particular importance³³.

N (plants) =Common: not of particular importance³⁴.

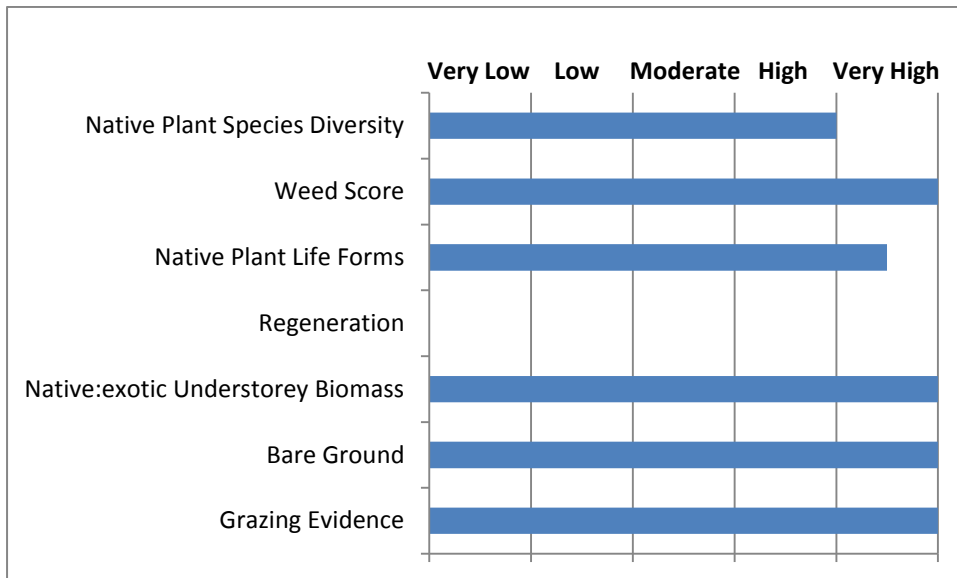
T (plants) =Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

Q (plants) =Not yet assessed but flagged as being of possible significance.

³² Biological Databases of South Australia, DEWNR, Adelaide.

³³ Definitions based on regional ratings obtained from Carpenter, G & Reid, J (2000) *The Status of Native Birds in South Australia's Agricultural Regions. Unpublished Database, 2000.* Department for Environment & Heritage, South Australia.

³⁴ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions.* July 2008 update of unpublished database. Department for Environment and Heritage.

Scores for Individual BushRAT Components:**Site photograph:**

Plant Species List:

AUS=Australia SA=South Australia SE = South East Botanical Region

E=Endangered: rare and in danger of disappearing from the wild in the short term T=Threatened: likely to be either endangered or vulnerable but insufficient data for a more precise assessment. V=Vulnerable: rare and in danger of disappearing from the wild in the long term R=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area K=status uncertain, but considered likely to be either rare, vulnerable or endangered U=Uncommon: less common species of interest but not rare enough to warrant special protective measures Q=Not yet assessed but flagged as being of possible significance N=Common: not of particular importance³⁵

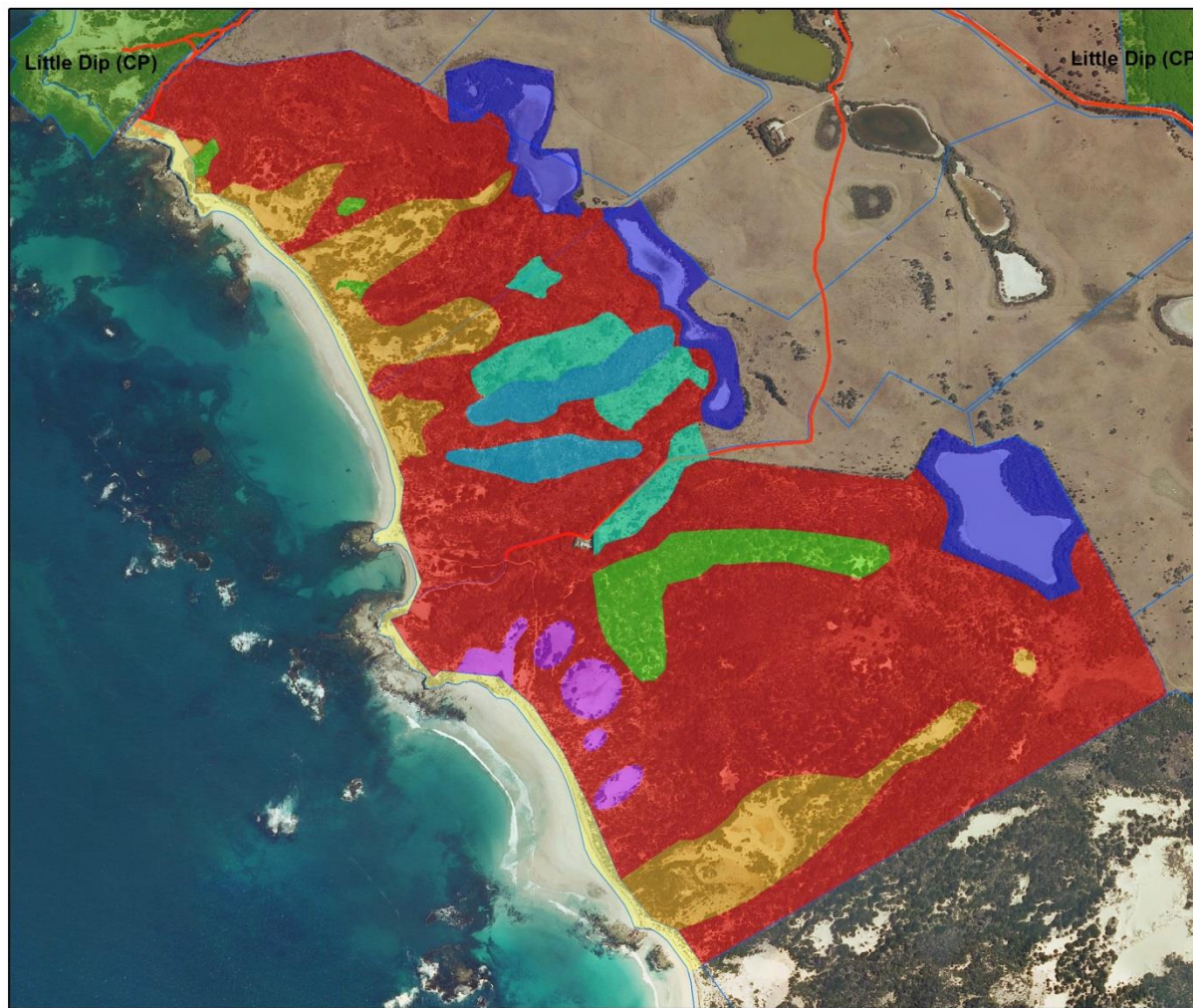
*=Introduced species

Species Name	Common Name	AUS	SA	SE
<i>Acacia leiophylla</i>	Coast Golden Wattle			
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	Coastal Wattle			
<i>Acaena novae-zelandiae</i>	Biddy-biddy			
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria			
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard			
<i>Ficinia nodosa</i>	Knobby Club-rush			
<i>Gahnia trifida</i>	Cutting Grass			
<i>Leptospermum lanigerum</i>	Silky Tea-tree			
<i>Lobelia anceps</i>	Angled Lobelia			
<i>Melaleuca lanceolata</i>	Dryland Tea-tree			
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			
<i>Olearia passerinoides</i> ssp. <i>glutescens</i>	Sticky Daisy-bush		R	K
<i>Poa</i> sp.	Meadow-grass/Tussock-grass			
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			
<i>Samolus repens</i>	Creeping Brookweed			
<i>Selliera radicans</i>	Shiny Swamp-mat			
<i>Tetragonia implexicoma</i>	Bower Spinach			
* <i>Bromus diandrus</i>	Great Brome			
* <i>Lolium</i> sp.	Ryegrass			

³⁵ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

BushRAT score sheet:

NVBMU Biodiversity Rapid Assessment Summary Scoresheet		
SITE: Nora Creina, Area 8		RECORDER: BM, PB, AA DATE: 21-22/10/2014
DESCRIPTION: Melaleuca lanceolata Shrubland with Gahnia trifida Sedgeland, plus Leptospermum lanigerum patches		BCM CODE: SE 6.6 - Brackish to Saline Tall Shrublands
VEGETATION CONDITION SCORE (max in	score	LANDSCAPE CONTEXT SCORE
Native Plant Species Diversity (15)	12	2 pts if site is the only substantial
Weed Score (15)	15	connection between 2 or more remnants ¹
Native Plant Life Forms (10)	9	>20 ha, 1 pt if site is degraded
Regeneration (8)	0	(scattered trees in part, fragmented etc)
Native:exotic Understorey Biomass (10)	10	Site Shape Score
Bare Ground (3)	3	3 pts if Cleared perimeter:Area (km/km ²)<6,
Tree Health (5)	0	2 pts if P:A 6 to<12, 1pt if P:A 12 to <18
Tree Hollows (5)	0	Size of remnant¹ patch (incl. native
Fallen timber (5)	0	veg on adjacent properties) score
Grazing Evidence (4)	4	Patch size less than 2 ha 0 pts
TOTAL (ADD UP ALL POINTS)	53	Patch size 2-5 ha 1 pt
If community is naturally treeless x TOTAL by 1.23	65.19	Patch size 5-10 ha 2 pts
If community is not benchmarked for regen x 1.11		Patch size 10-20 ha 3 pts
ADJUSTED TOTAL SCORE	65.19	Patch size 20-100 ha 4 pts
		Patch size 100-500 ha 5 pts
		Patch size >500 ha 6 pts
CONSERVATION SIGNIFICANCE SCORE:	score	Distance to remnant area of more than
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E ecosystem/ecological	12	50 hectares score
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E plant species present ² .	2	>3km 0 pts
1 pt for each State-R, 2 pts for each State-V, 3 pts for each State-E or Nationally-V, 4 pts for each Nationally-E fauna species for which suitable habitat is present. Double points for a sighting. ³	8	1-3km 1 pt
% native vegetation remaining in IBRA Assoc. 0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts; >10-20%= 2 pts; >20-50%= 1 pt; >50% = 0 pts	1	<1km 2 pts
1 pt if Site contains a riparian zone, 2 pts if contains swamp/wetland (+/- riparian zone)	2	contiguous 3 pts
CONSERVATION SIGNIFICANCE SCORE	25	LANDSCAPE CONTEXT SCORE
		11
		Sum adjusted Vegetation Condition, Conservation significance and Landscape Context Scores for the
		UNIT BIODIVERSITY SCORE
		101.2
		Total Biodiversity Score (UBS x size)
		2297
Cleared perimeter(m)	Size(ha)	P:A Ratio
2300	22.7	10.13
Total no. native species	Adjust for Spring⁴	Environmental Association
17		Beachport
Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max.6)	Invasive Threat Category (max.5)
* <i>Bromus diandrus</i>	1	1
* <i>Lolium sp.</i>	1	2
		#REF!
		#REF!
		#REF!
		Total Cover x Threat Invasion
		3



Vegetation Map

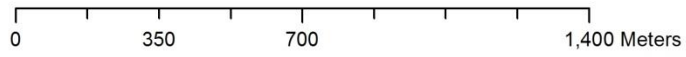
Site_Area

- Area 1
- Area 2
- Area 3
- Area 4
- Area 5
- Area 6
- Area 7
- Area 8

DCDB_Parcel

TOPO.Roads

CONSERVATION.NpwsaReserves





Justin & Damian Scanlon
Nora Creina Limited PER Investigations
Report

September 2015

Table of contents

1.	Introduction	1
1.1	Purpose of this report	1
1.2	Scope and limitations	1
1.3	Background	3
1.4	Previous Reports.....	3
2.	Coastal Erosion.....	4
2.1	Response to PER Guideline 5.3.22 – Impacts on Beach and Dune Forms	4
2.2	Response to PER Guideline 5.3.23 – Sand Drift Remediation.....	4
2.3	Response to PER Guideline 5.3.24 – Erosion Due to Sea Level Rise	4
2.4	Response to PER Guideline 5.3.25 – Impacts from Abalone Farm.....	5
2.5	Response to PER Guideline 5.3.26 – Impacts on Coastal Wetlands	5
2.6	Response to PER Guideline 5.3.27 – Impacts on Nearby Conservation Values.....	5
2.7	Response to PER Guideline 5.3.28 – Impacts on Coastal Habitat	6
3.	Marine Environment	7
3.1	Response to PER Guideline 5.3.29 through to 5.3.31 – Marine Environment	7
3.2	Response to PER Guideline 5.3.32 - Marine Environment	9
4.	Geology, Soils, Groundwater & Site Contamination	10
4.1	Response to PER Guideline 5.3.34 – Hydrogeology	10
4.2	Response to PER Guideline 5.3.35 – Erosion Processes.....	11
4.3	Response to PER Guideline 5.3.36 – Existing Groundwater & Land Conditions	11
4.4	Response to PER Guideline 5.3.37 – Preliminary Site Investigation (PSI)	12
4.5	Site Inspection and Description.....	14
4.6	Potentially Contaminating Activities (PCAs)	15
4.7	Preliminary Site Investigation Outcomes.....	16
4.8	Response to PER Guideline 5.3.38 – Groundwater Resources	16
4.9	Response to PER Guideline 5.3.39 – Potential Groundwater Impacts	16
4.10	Response to PER Guideline 5.3.40 – Submarine Groundwater discharge	17
4.11	Response to PER Guideline 5.3.41 – Impact Avoidance	17
5.	Risk & Hazard Management.....	18
5.1	Response to PER Guideline 5.9.5 – Pollution	18
5.2	Response to PER Guideline 5.9.6 – Acid Sulfate Soils.....	18
6.	References	19

Table index

Table 1 – Hydrogeology

Table 2 – Existing Groundwater & Land Conditions

Table 3 – Site Identification Details

Table 4 – Summary of Historical Aerial Photographs

Table 5 – Domestic Activities undertaken as per the Environment Protection Regulations (2009)

Table 6 – Areas of Potential Environmental Concern & Significance

Appendices

Appendix A - Figures

Appendix B - Current & historical CT Information

Appendix C - Historical Aerial Photographs

Appendix D - Search Results

Appendix E - ASRIS Map

Appendix F - Site Photos

1. Introduction

GHD Pty Ltd (GHD) was engaged by Justin and Damian Scanlon (Scanlons) to undertake environmental investigations to inform part of the Public Environmental Report (PER) including investigations into the Coastal and Marine Environment, Geology, Soils, Groundwater and Site Contamination.

1.1 Purpose of this report

This report is to provide a response to various PER Guidelines required to be addressed for the proposed Nora Creina Golf Course and Tourism Resort.

1.2 Scope and limitations

GHD has been engaged to investigate some of the PER Guideline requirements, including Guidelines 5.3.22 through to 5.3.28 (excluding 5.3.25 as the abalone farm is no longer being proposed) on coastal erosion, Guidelines 5.3.29 through to 5.3.32 regarding the marine environment, Guidelines 5.3.34 and 5.3.35 on geology and soils, 5.3.36 through to 5.3.41 on groundwater and site contamination, as well as 5.9.5 and 5.9.6 dealing with risk and hazard management specific to pollution from hazardous materials and acid sulphate soils.

This report: has been prepared by GHD for Justin & Damian Scanlon and may only be used and relied on by Justin & Damian Scanlon for the purpose agreed between GHD and the Justin & Damian Scanlon as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Justin & Damian Scanlon arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Justin & Damian Scanlon and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has not been involved in the preparation of the final PER Report and has had no contribution to, or review of the PER Report other than in the Nora Creina limited PER Report . GHD shall not be liable to any person for any error in, omission from, or false or misleading statement in, any other part of the PER Report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

1.3 Background

GHD understands that the proposed Golf Course and Tourism Resort development near Nora Creina is to be assessed as a Major Development under the provisions of Section 46 of the *Development Act 1993*. It comprises a 36 hole world class public golf course (and associated practice range/greens, clubhouse, restaurant, accommodation and retail facilities), as well as a boutique Wagyu beef farm, boutique vineyard and recreational facilities (such as nature trails and for recreational fishing and diving). The subject land is 900 acres comprising a mix of cleared farmland and natural coastal ecosystems.

The Development Assessment Commission (DAC) considered the implications of the proposal and determined that a Public Environment Report (PER) was considered appropriate for the range of issues to be investigated.

A topographical survey of the site showing cadastral boundaries is provided in Appendix A.

1.4 Previous Reports

GHD has reviewed the following reports relating to the subject site, as well as information sourced as detailed in Section 6, References, in providing this report:

- Nora Creina BushRAT Vegetation Survey, October 2014 , EAC Ecological Evaluation
- Draft Restoration Plan for Scanlon's Lake Karinya Coastal Lake Complex, July 2010, DENR

2. Coastal Erosion

This Chapter provides a response to PER Guidelines 5.3.22 through to 5.3.28 (excluding 5.3.25 as the abalone farm is no longer being proposed).

2.1 Response to PER Guideline 5.3.22 – Impacts on Beach and Dune Forms

Describe the effect of the proposed development on the beaches, coastal dunes and the calcarenite formations of the site (and associated vegetation communities) and outline management and rehabilitation measures for these areas, including reference to long-term strategies to protect vegetation on coastal dunes from trampling and other disturbances associated with the anticipated increases in visitation rates.

This section of coastline is routinely exposed to some of the most severe wind and wave conditions in Australia.

The development proposal involves the creation of a golf course on elevated dune areas.

If natural dune function is allowed to continue (i.e. erosion is permitted to occur), the development would not be expected to affect beach behaviour as sand will be readily supplied from the dune to the beach.

No infrastructure is proposed to cross the beach, although it is expected that pedestrian access to the beach will be provided at a limited number of locations. Pedestrian damage to dunes and calcarenite formations could be limited through the provision of appropriately located designated access paths, and fencing and landscaping to encourage use of the access paths.

2.2 Response to PER Guideline 5.3.23 – Sand Drift Remediation

Describe measures to be adopted for the remediation of sand drift, should it occur within the dune system as a direct result of the development.

No part of the development is intended to directly interfere with wave or tide driven coastal processes such as longshore sediment transport. However, aeolian, or wind-blown, transport is very dominant along this section of coastline, and the coastline from Robe to Beachport is marked by significant areas affected by wind-blown sand known as blow-outs.

As blow-outs tend to occur in areas where there is a lack of vegetation, measures to be implemented to limit the frequency and extent of blow-outs would be expected to include intensive revegetation with native species, installation of dune fencing to trap wind-blown sand, pest management and provision of appropriately located designated access traversing the dune.

2.3 Response to PER Guideline 5.3.24 – Erosion Due to Sea Level Rise

Identify the impact of coastal erosion due to the expected sea level rise of 0.3 metre to 2050 and 1.0 metre to 2100.

A detailed, site specific assessment of coastal recession due to sea level rise is beyond the scope of this assessment. Using the Brunn factor suggested by Mariani et al (2012), horizontal erosion due to sea level rise of 0.3 m by 2050 would be in the order of 15 m. By 2100, horizontal erosion due to a 1.0 m sea level rise would be in the order of 50 m.

Modelling of generic recession due to sea level rise for various shoreline types around Australia was undertaken by Mariani et al (2012). Whilst the Limestone Coast shoreline was not assessed, the nearby Discovery Bay coastline of western Victoria was; this latter coastline is similar to the Limestone Coast in terms of geology and coastal exposure (Bird, 1993), although for the Limestone Coast the frequency of calcarenite outcrops are more prevalent along the shoreline. The presence and proximity of these outcrops will limit changes to the beach shape and form, therefore the Discovery Bay erosion estimates could be considered to be greater than what would be reasonably expected for Nora Creina.

2.4 Response to PER Guideline 5.3.25 – Impacts from Abalone Farm

N/A – The proposed Abalone Farm is no longer part of the development proposal.

2.5 Response to PER Guideline 5.3.26 – Impacts on Coastal Wetlands

Describe the effect on the coastal wetlands on the site (which form part of the Karinya Coastal Lake Complex), including from cattle grazing and vineyard management.

The concept plan proposes the golf course, golf club, resort and villas as being centred on the coastal dune area away from the wetlands. Six of the proposed golf course holes are in close proximity or immediately adjacent to two of the coastal lakes/wetlands. Depending on the final golf course design, it may be necessary to cross one of the wetlands to link holes 5 and 6, while hole 7 directly crosses over another wetland. Consequently, there is potential for indirect or direct impacts on these wetlands and this should be taken into account when finalising the design.

The beef farm, vineyard and recreational facilities (e.g. nature trails) are not shown on the concept plan but will be located in the already cleared agricultural land, which is separated from the sand dune area by the coastal lake complex. There is potential for direct and indirect impacts although this will depend on the final golf course design as well as construction methods employed. This will need to be considered and included in the relevant construction and operational environmental management plans for the site (see Section 5.1).

2.6 Response to PER Guideline 5.3.27 – Impacts on Nearby Conservation Values

Describe the effect on the conservation values of the nearby Little Dip Conservation Park, Lake Eliza (which forms part of the South East Coastal Salt Lakes complex and is listed in the Commonwealth Department of the Environment Directory of Important Wetlands in Australia) and the Heritage Agreement area south of the site.

The constituent parts of the Robe to Beachport Coastal Lakes Complex are classified as key Groundwater Dependent Ecosystems (GDEs) (DEWNR, 2012), while those of the more extensive lake complex incorporating Lake Eliza, Lake St Clair and Lake George are classified as High Value GDEs (DEWNR, 2012). Consequently, depending on the local groundwater regime, there may be the potential for indirect impacts on Lake Eliza in terms of water quality and availability.

In addition, there exists the potential for increased weed invasion into the Little Dip Conservation Park and the Heritage Agreement area from the northern and southern boundaries of the Scanlon property. This will be dependent upon the extent of weed control during and after construction which can be controlled by the relevant construction and operational environmental management plans for the site (see Section 5.1).

2.7 Response to PER Guideline 5.3.28 – Impacts on Coastal Habitat

Describe the effect on the habitat value of on-site native vegetation that provides a wildlife corridor along the coast (including coastal Crown land), especially to link the Little Dip Conservation Park with the Heritage Agreement area south of the site.

The concept plan indicates that the coastal dune habitat would be significantly fragmented for approximately 2-3 km, and consequently result in an interruption to the coastal habitat corridor. The exact area of native vegetation proposed to be impacted is unknown, but could be up to approximately 70 ha, based on the concept plan. Hole 11 at the north of the site almost completely fragments the site from the Little Dip Conservation Park to the immediate north of the site.

This fragmentation could open up the habitat to predators and result in increased potential for weed invasion via edge effects. The effect of fragmentation of habitat on the site itself and in the broader context of vegetation to the north and the south, would be dependent on the characteristics of each species, with ground-dwelling mammals potentially affected the most. It is noted that the fauna species likely to be of most interest are those listed in a review of the results of a search of the EPBC Protected Matters database for the area. The review evaluated the likely presence of habitat for threatened species in the subject area. The list is reduced to five species including three species of birds, one species of frog and one species of fish, with no ground dwelling mammals listed (Barron Environmental) . On this basis the effect on the habitat value due to fragmentation is considered to be a manageable environmental issue.

3. Marine Environment

This Chapter provides a response to PER Guidelines 5.3.29 through to 5.3.32.

The coastline of the southeast corner of South Australia is a high energy environment with long sandy beaches interspersed with rocky headlands. The area is exposed to the Southern Ocean and is exposed to a moderate wave climate following attenuation of high wave energy by an offshore-nearshore shallowing gradient. Despite this mitigation of wave activity, beach erosion and foredune scarping are common.

3.1 Response to PER Guideline 5.3.29 through to 5.3.31 – Marine Environment

Describe the marine ecological assets in the vicinity of the site and current levels of disturbance.

Describe the existing marine and aquatic communities potentially impacted by the proposal (especially invasive species and species listed under the EPBC Act).

Describe the direct and indirect impacts (including potential discharges from the development, such as from the abalone farm and contaminated groundwater or surface water resulting from golf course and vineyard irrigation) on marine/aquatic communities and the proposed measures to mitigate impacts.

The marine productivity of the region is high as a result of the annual nutrient rich Bonney upwelling which is believed to be the most significant coastal upwellings along the South Australian coastline (Butler *et al.*, 2013). The upwelling occurs between May and December each year and results from south easterly winds forcing shallow waters out to sea which are then replaced by cold nutrient rich waters from deeper offshore. The marine communities of the area are relatively isolated from other systems along the southern Australian coastline due to the oceanographic characteristics of the area including the pattern of currents and bathymetry.

The marine benthic area immediately offshore from the beach is a complex network of heavy limestone or Calcarene reefs covered by macroalgae of varying densities. There are also some areas of sandy bottom that is vegetated. Algal diversity on the hard substrata is high (Shepherd, 1981) and kelp forests are a distinctive feature of the marine environment of the South East region (DENR, (2010). The kelp forests are dominated by the Giant Kelp *Macrosystis angustifolia* and the Bull Kelp *Durvillea potatorum*. These kelp areas are interspersed with areas dominated by red algae at depths of 4 to 10 metres. Below the main algal cover and algal turfs of 1 to 2 cm high which extend to depths of around 20 metres. The faunal communities of these reefs are diverse with herbivores such as Abalone and Pheasant shells and a diverse reef fish fauna.

There is no seagrass offshore from the proposed development, the lack of suitable substratum and high energy environment preclude the establishment of seagrasses in this area, though they are common in more sheltered areas along the South East coast of South Australia.

Over 600 marine inshore fish species are known from this coastal region (Wilson and Allen, 1987), with the reef areas offshore reported to support breeding areas for a number of commercially and recreationally important fishes including the gummy shark and whaler shark, snapper, West Australian salmon and King George Whiting.

The region supports a number of commercial fisheries. These being the:

- Southern Zone Abalone Fishery;

- Southern Zone Rock Lobster Fishery;
- Marine Scalefish Fishery; and
- Miscellaneous Giant Crab Fishery.

The influence of the Bonney Upwelling has an influence on the abundance and diversity of marine megafauna which are common in the area. The increased production ultimately provides a food source for penguins, seals and whales.

The sandy beaches along the coastline adjacent to the proposed development support populations of resident and migratory shorebirds. Sandy beaches by their nature have few animals and plants being supported by this constantly shifting, highly disturbed area that has little in the way of support or food for its inhabitants. .

Current levels of disturbance are relatively low. The beach is used by recreational fishers and by others engaging in passive recreation such as walking along the beach as well as swimming surfing and snorkelling. Popular activities along the coast also include camping and four wheel driving, although it is noted there will be no vehicle access to the beaches on the subject land. Disturbance to the subtidal marine areas apart from recreational and commercial fishing for abalone, rock lobster, giant crab and scale fish is low.

The proposed project has the potential to impact upon the marine and coastal environment through a number of pathways. The potential impacts will largely be indirect as no activities are proposed within the marine or coastal environments themselves and can all be taken into account when preparing construction and operational management plans.. These disturbances include:

- Access and disturbance through human encroachment on the beach. It is understood there will be no vehicle access to the beach areas as part of the proposed development, which will assist in limiting erosion, native vegetation decline and loss of habitat particularly for nesting and feeding shorebirds. The EPBC and State listed Hooded Plover when nesting is particularly vulnerable to disturbance from people particularly with dogs and vehicles on the beach (Baker-Gabb and Weston, 2006). Introduced predators such as foxes and cats also pose a threat to this and other shorebirds. The Hooded Plover has been seen in the area of the proposed development where this bird nests in coastal dunes near the beach, feeding on invertebrates particularly those associated with macroalgal wrack. Preventing vehicle access, fencing off areas that are not required for the development itself, and providing clearly marked and appropriately designed pedestrian access to the beach will assist in controlling the ways in which people access the beach areas. Controlling access during both the construction and operational phases of the proposed project should be considered and included in the relevant construction and operational environmental management plans for the site (see Section 5.1). Education of guests and users of the proposed facility as to the potential impacts their behavior has on the natural environment should be considered.
- Stormwater and runoff releases excess nutrients and pollutants into the marine environment. Golf courses, and vineyards, use herbicides, pesticides and fertilizers as part of their general operational programs. If not properly managed and if runoff from the course is not properly treated then there is a risk that stormwater runoff from the course and or vineyard could pose a risk to the marine environment. It is unlikely that there would be any significant impacts from fertiliser runoff into the open ocean as the high level of wave action and frequent aeration of the inshore waters would likely result in excellent mixing and little change for any ongoing effects. Herbicides and pesticides however have the potential for toxic impacts on marine fauna and flora. These will need to be managed and runoff properly treated such that it cannot discharge directly to the

ocean. This matter should be considered and included in the relevant construction and operational environmental management plans for the site (see Section 5.1).

- Marine debris from land based wastes and plastics in particular have the potential to have an adverse impact on marine fauna. Seabirds and marine mammals can become entangled in discarded tackle or ingest floating plastics. Waste management needs to be a focus of the golf course development to ensure that wastes are properly contained and collected such that they cannot enter the marine environment. This matter should be considered and included in the relevant construction and operational environmental management plans for the site (see Section 5.1).
- Vegetation clearance and beach/dune loss, can lead to erosion therefore have impacts upon the beach and to a lesser extent the marine environment. Major modifications to the dunal system can interfere with nesting of shorebirds, particularly the Hooded Plover. Disturbance of the natural dune areas needs to be kept to a minimum. It is understood that the design of the golf course, which is similar to others already in operation, does not propose significant earthworks that would result in major modification of the dunes and rather focuses on utilising the existing 'lay of the land' as much as possible. If possible natural areas should be fenced off to protect the dunes from people and animals wandering through causing erosion and interfering with native flora and fauna. Removal of beach vegetation can encourage the colonisation of newly cleared areas with weeds which can have an adverse impact on the natural ecology of the area. Weeds and pest management need to be considered and included in the relevant construction and operational environmental management plans for the site (see Section 5.1).

3.2 Response to PER Guideline 5.3.32 - Marine Environment

Describe the effect of the development (for both the construction and operational phases) on the Upper South East Marine Park, especially the adjoining habitat protection zone (including the beach).

The proposal should have limited impacts on the Upper South East Marine Park. If properly managed (see above) the project should have limited impact on both the beach and the marine environment itself.

4. Geology, Soils, Groundwater & Site Contamination

This Chapter provides a response to PER Guidelines 5.3.34 and 5.3.35 on geology and soils, 5.3.36 through to 5.3.41 on groundwater and site contamination.

GHD staff completed a site inspection on 12 August 2015 during which photographs of the site's current environment and condition were taken. These are presented in Appendix B.

4.1 Response to PER Guideline 5.3.34 – Hydrogeology

Describe the hydrogeology of the site in relation to soil types, geology and surface drainage patterns, including any drainage to on-site wetlands, Lake Eliza and the marine environment.

Table 1 Hydrogeology

Conceptual Element	Description
Relevant surface water features and drainage	<p>The proposed project is situated within the Millicent Coast surface water basin.</p> <p>The surface geomorphology can be described as low lying, with parallel dune limestone ridges with intervening swamps.</p> <p>An extensive lake complex exists on the landward side of the coastal sand dunes, incorporating the salt lakes of Lake Eliza, Lake St Clair and Lake George in the proposed project area.</p> <p>Regional surface water drainage has undergone anthropogenic changes post European settlement. Namely, a number of regional surface water drainage networks have been developed, which input large quantities of fresh water seasonally into some coastal lakes (e.g. Drain M discharges to Lake George) (DEWNR / SMK, 2014). Outlet channels have also been cut into some of the coastal lakes to allow the regional drainage network to discharge to the sea.</p>
Soil types	<p>Soils around Nora Creina comprise silt and sand, with shell grit fragments. These soils comprise high sea level marine deposits.</p>
Outcrop geology	<p>Regionally, the Gambier and Murray Group Limestones outcrop in the higher inland plains to the east, with younger Coomandook, Bridgewater and Padthaway Formations outcropping in the low-lying flats, including Nora Creina.</p> <p>These sediments are interspersed with a series of northwest-trending remnant sand dune ridges, which run along the shoreline and form part of a barrier system that extends from Robe to Mt Gambier.</p> <p>The surface geology around Nora Creina comprises Quaternary marine deposits on the flat plains, consisting of sand, gravel, silt, clay and shell grit. Along the coastline, aeolianite consolidated beach sands and calcareous and siliceous dune sands are present (Geological Survey of South Australia, 1951 - Penola Mapsheet).</p>

4.2 Response to PER Guideline 5.3.35 – Erosion Processes

No coastal protection structures are proposed at this conceptual stage. As detailed in the response to PER Guideline 5.3 22, if natural dune function is allowed to continue and erosion due to wave action is permitted to occur, the development would not be expected to affect natural erosion processes.

The prevalence of blow-outs along this section of coastline has already been identified in the response to PER Guideline 5.3 23. Turfing and irrigation of tees, greens and fairways, as would be expected on a golf course, will encourage stabilisation of the dune sands against wind erosion, and therefore blow-out development.

4.3 Response to PER Guideline 5.3.36 – Existing Groundwater & Land Conditions

Describe the known existing groundwater and land related environmental conditions, including possible site contamination.

Table 2 –Existing Groundwater & Land Conditions

Conceptual Element	Description
Relevant aquifer/s ⁽³⁾	<p>The aquifer of most relevance is the upper unconfined Quaternary and Tertiary Limestone Aquifer (known generally as the Unconfined Aquifer). This aquifer consists of calcareous sandstone and limestone. It incorporates the Coomandook, Bridgewater and Padthaway Formations in the low-lying flats, which are interspersed with a series of northwest-trending remnant sand dune ridges (SE NRM Board, 2014).</p> <p>The Unconfined Aquifer is potentially underlain by an aquitard comprising marl and carbonaceous clay deposits. The underlying lower Tertiary Aquifer is a confined sand aquifer that is likely to occur at depths greater than 290 m below ground surface.</p>
Depth to water table ⁽⁴⁾	<p>Available desktop information indicates the depth to groundwater is likely to be less than 6 m below ground level (Department for Water and South East Resource Information centre, February 2012).</p> <p>DEWNR (2015) indicates a decline in water level of around 0.1 m to 0.25 m or less for the Unconfined Aquifer from 2013 to 2014.</p>
Groundwater quality	<p>Groundwater salinity averages around 1,000 mg/L TDS in the Unconfined Aquifer (DEWNR, 2012). On the coastal plain and inter-dunal flats, both the Unconfined Aquifer and the Confined Aquifer of the Lower Limestone Coast PWA were assigned a yellow status by DEWNR (2015) for 2014, indicating “<i>gradual adverse changes indicating a low risk to the resource in the medium term</i>”.</p> <p>Groundwater salinity in the underlying Confined Aquifer ranges from 500 mg/L to 1,000 mg/L TDS (DEWNR, 2012).</p>

Groundwater users	<p>Groundwater is the major source of water for domestic, agricultural (irrigation), industrial and recreational (watering of golf courses) use in the South East region of South Australia (DWLBC, 2004).</p> <p>Groundwater is typically extracted from the Unconfined Aquifer for domestic, agricultural and recreational uses, with annual groundwater extraction in the order of 150,000 ML.</p> <p>The deeper Confined Aquifer provides township water supplies for six towns, including Robe. The Robe township water supply comprises six extraction bores, with annual groundwater extraction in the order of 15,000 ML.</p>
Potential for GDEs ⁽⁵⁾	<p>The Robe to Beachport Coastal Lakes Complex are classified as key GDEs (DEWNR, 2012), while the more extensive lake complex incorporating Lake Eliza, Lake St Clair and Lake George are classified as High Value GDEs (DEWNR, 2012).</p> <p>These lakes are listed on the Directory of Important Wetlands of Australia (DIWA) and are identified as GDE (surface expression of groundwater) based on BoM data⁽⁵⁾. The Atlas of Groundwater Dependent Ecosystems considered the nature of groundwater connection as permanent or near permanent.</p>

4.4 Response to PER Guideline 5.3.37 – Preliminary Site Investigation (PSI)

Site Identification

A topographical survey of the site showing cadastral boundaries is provided in Appendix A.

Table 3 Site Identification Details

Site Address	1462 & Lot 200-202 Nora Creina Road, Nora Creina, South Australia
Certificate of Title/s	CT 6058/185, CT 6071/913, CT 6071/914 and CT 6071/915
Legal Description	Allotment 14 in Deposited Plan D70078 and Allotments 200-202 in Deposited Plan 85108 in the Hundred of Waterhouse.
Local Government Authority	District Council of Robe
Current Zoning*	Coastal Conservation
Proposed Landuse	Golf course, accommodation and retail facilities as well as a boutique Wagyu beef farm, boutique vineyard and recreational facilities (such as nature trails and recreational fishing and diving)
Area (ha)	354

*Council development plan dated 28 August 2014

A copy of the current certificates of title for the site and an extract from the Robe Council Development Plan consolidated 28 August 2014 have been provided in Appendix B.

Site History

Historical Property Ownership

Historical title information was sourced from the Lands Title Office and is summarised in Appendix B. The search revealed that since the gifting of the land in the late 1800s, it has been owned by graziers or farmers.

Aerial Photographs

Historical aerial photographs of the development area and surrounding site were obtained from Mapland, Department of Environment, Water and Natural Resources. A review of the historical aerial photography is provided in Table 4 and should be read in conjunction with the photographs provided in Appendix C.

Table 4 Summary of Historical Aerial Photographs

Year	Site Description
1951	The Nora Creina Road is visible as a dirt road running parallel to the coast and passing west of the Little Dip Lake then forming the eastern boundary of the subject property. The site access off Nora Creina Road is visible across the road from the Little Dip Lake and this track continues through the subject land to the east of Scanlon Lake and connects to another dirt track that runs from Nora Creina Road through to the coast. The area adjacent to the entrance appears cleared but no dwellings appear to be present. The majority of the site is vegetated and there are two series of small lakes that run parallel to the coast, one near the sand dunes and one nearer the Nora Creina Rd. The sand dunes extend from the beach through to near the western side of Dolly Lake and halfway towards Pud Lake on the south side of the beach access track. The surrounding land consists of Lake Eliza and bushland to the east, Little Dip conservation park to the north, coastal dunes to the south and the coast to the west.
1965	Nora Creina Road is visible and appears to have been improved, possibly graded, although it's still a dirt road. Adjacent to the north of the site access track there appears to be two or three buildings. The majority of the site to the east has been cleared, extending from the series of lakes near the coastal dunes through to Nora Creina Rd from approximately 100m north of the track that provides beach access. South of this track approximately one third is sand dune, one third vegetated and the third adjacent Nora Creina Road is cleared. The surrounding land consists of Lake Eliza with a large amount of cleared land to the east, Little Dip conservation park to the north, coastal dunes to the south and the coast to the west.
1975 1:10100	This aerial does not include the top portion of the site and Nora Creina Road is not visible. The portion of the site to the north of the beach access track appears to have been further cleared to the extent of lakes near the coastal dunes. There is a small clearing at a bend in the beach access track where three small buildings are present. The remainder of the site appears similar to previous. The only surrounding land visible in this photograph is to the south where the sand dunes continue to the extent of the photograph.
1987	Nora Creina Road is visible to the east with the access track now running between lakes to a dwelling, consistent with the location of the current house. This track continues south and forms the access track to the beach. The majority of the site is cleared to the east of the sand dunes. The main homestead appears to have two rainwater tanks to the south west as well as two sheds to the west. The number of buildings at the clearing near the beach appears to have increased. The coastal dunes to the north of the beach access track appear to have regenerated slightly. The surrounding land to the east and south appears to have been further cleared and Little Dip conservation park is still visible to the north.
1997 1:40 000	This photograph appears similar to the previous with the main observable changes including further regeneration of the coastal dunes, and the beach access track now divides into three west of the clearing where buildings are present. One track accesses the northern beach, one goes to the headland (German Point) and the third provides access to the southern beach. The area around the homestead appears grassed with trees to the west and a larger shed to the north west. The surrounding land appears similar with further regeneration of the sand dunes.
2005	This photograph appears similar to the previous with the main observable changes including further regeneration of the coastal dunes, and there are more trees around the homestead. The surrounding land appears similar with further regeneration of the sand dunes.

EPA Section 7 Search

A search of the South Australian Environment Protection Authority (EPA) database for information relating to the airport site was conducted in accordance with Section 7 of the Land and Business (Sale and Conveyancing) Act, 1994. The SA EPA advised in written form on 12 August 2015 that it has no records of issues associated with:

- Particulars of mortgages, charges, prescribed encumbrances affecting the land.
- Particulars relating to environmental protection including:
 - Environmental assessments;
 - Waste depots;
 - Production of certain waste; and
 - Waste on land.

A copy of the written responses issued by the EPA from the Section 7 search is presented in Appendix D.

SA EPA Site Contamination Public Register

The SA EPA maintains a list of the Section 83A Notification, Audit Notification, Audit Termination and Audit Report following notification and reports received by the SA EPA since 1 July 2009 under the Environment Protection Act 1993. A search of this register for the suburb of Nora Creina was undertaken on 30th July 2014, and the results of the search showed no 83A notifications or site contamination audits for Nora Creina.

Dangerous Substances Licence

A response to a Dangerous Substances Licence search request was received from SafeWork SA (Attorney-General's Department) on 13 August 2015. A copy of the written response issued by SafeWork SA is presented in Appendix D.

The dangerous substances records indicate that no licensed items were recorded for the site.

4.5 Site Inspection and Description

A site inspection was conducted by GHD on 12 and 13 August 2015 with pertinent site features described below. The concept plan is provided in Appendix A and Site photographs are shown in Appendix F.

The site generally comprises of two sections with the eastern portion of the site farmland used for grazing of cattle and the western section coastal dunes with thick scrubland. There is a homestead situated near the centre of the grazing land overlooking some small lakes located in this portion of the site, including Lake Scanlon. There were two water tanks, a bore, a septic tank and a large shed containing a boat and 4-wheel drive vehicle associated with the homestead, which has a front and back lawn and is surrounded by trees. No information is known regarding the bores depth or date of installation. It is understood to be used for irrigation and potentially stock watering. A large abandoned shed is adjacent to the entrance track but could not be accessed.

The western portion of the site comprises coastal dunes that are well vegetated, with pristine beaches. There is a track leading to the central headland (German Point) to the north of which lies a small bay with another small headland and aboriginal midden, followed by a larger bay that extends to the northern extent of the site. There are two access tracks for the northern and southern beaches that split from the central track east of German Point. To the south of German Point extends a beach to the sites boundary and beyond. There is a second series of small lakes at the eastern edge of the coastal dunes.

There is a clearing in the vegetated western portion of the site that contains three old wooden and tin buildings, as well as a windmill and well, and two shipping containers which are understood from anecdotal information provided by the Scanlons, to contain fishing and diving gear. No information is known regarding the bores depth or date of installation. Some old iron water tanks and sheds were abandoned in the bush surrounding the old buildings, which appeared uninhabited and are understood to have previously been used as beach houses. Frogs were observed at all lakes during the site inspection, as well as some kangaroos near Dolly Lake. Cattle were present on site near the homestead and it is understood that they roam between the neighbouring property to the north and the subject site.

4.6 Potentially Contaminating Activities (PCAs)

The following Potentially Contaminating Activities (PCAs) as defined in the Environment Protection Regulations (2009) may have occurred at the Site.

Table 5 Domestic Activities undertaken as per the Environment Protection Regulations (2009)

Activity	Definition
Agricultural activities	Any of the following activities undertaken in the course of agriculture: <ol style="list-style-type: none"> 1. Burial of animals or parts of animals; 2. Burial of other waste; 3. Irrigation using wastewater; 4. Intensive application or administration of a listed substance to animals, plants, land or water (excluding routine spraying, in accordance with manufacturers' instructions, of pesticides used in broad-acre farming)

The following table (Table 6) summarises the areas of potential environmental concern based on the results of the desk-top review and site inspection.

Table 6 Areas of Potential Environmental Concern and Significance

Description	Rationale / Details	Potential Contaminants	Likely Significance
Grazing of cattle	The subject site is open to the neighbouring land where cattle graze and they use the cleared land on the subject site for grazing.	Cattle dips can result in heavy metal (arsenic) and DDT contamination. Livestock residues (heavy metals, OCPs/OPPs)	Low No cattle dips or spray race facilities identified on site. Refer to below regarding weed management.
Spraying of vegetation with pesticides	It is understood from information received from the Scanlons that aerial spraying was previously undertaken to control weeds but ceased over 8 years ago.	(Roundup) OCPs/OPPS	Low Typically surficial contamination that requires regular use to infiltrate deeper in the soil profile. The half life of commercial Roundup (cited as weedicide utilised on site) is less than 6 months in soil and therefore not considered to still be present and therefore poses a low risk.

Description	Rationale / Details	Potential Contaminants	Likely Significance
Septic Tank	Located at the rear of the homestead.	Nutrients, faecal coliforms	Low Potential for the septic tank and associated infrastructure to leak and leakage of effluent to surrounding soil which could migrate horizontally through preferential pathways in soil or vertically to groundwater. Considered unlikely to occur and the consequence is minor so a low risk.

4.7 Preliminary Site Investigation Outcomes

The PSI has identified a number of potentially contaminating activities at the site which are considered unlikely to have potential impacts to shallow and deep soils as well as groundwater at the site. These PCA's are identified in Table 6 above.

The site inspection undertaken by GHD (August 2015) provided no observable evidence of site contamination associated with the sites current use, and further the PCA's identified are not considered to pose a current risk to the site as either they occurred long ago in the case of weed spraying, or have not occurred in the case of cattle dips or a leaking septic tank. No sampling of soil or groundwater has been undertaken as part of this investigation.

4.8 Response to PER Guideline 5.3.38 – Groundwater Resources

Detail the measures to be taken to manage and monitor any groundwater resources.

The proposed project lies within the boundaries of the Lower Limestone Coast (LLC) Prescribed Wells Area (PWA), which has been designated under South Australia's *Natural Resources Management Act 2004*. Prescription means that the water resource must be sustainably managed to provide security for all water users, now and into the future. The PWA pertains to all groundwater resources in the southern half of South Australia's southeast region (all areas south of the Coorong), including the Unconfined Aquifer and the underlying Confined Aquifer. The Padthaway and Tatiara PWAs border the LLC PWA to the north.

Throughout South Australia, Natural Resources Management (NRM) Boards are responsible for working with the community to develop and review water allocation plans (WAPs) for the region. At the proposed project area, the South East NRM Board (the Board) has developed a WAP that sets out the rules for managing and taking groundwater within the LLC PWA (South East NRM Board, 2013). The WAP rules ensure that environmental water requirements are taken into account when allocating for consumptive purposes (licensed and non-licensed). It sets the amount of water that will be available, how that water may be allocated to users, and the types of activities that are permitted with that water. Since a WAP is in place, the issue and transfer of water allocations and licences are subject to the rules and limits of the WAP.

4.9 Response to PER Guideline 5.3.39 – Potential Groundwater Impacts

Detail the potential impacts on the underlying groundwater from nutrients and chemicals leaching from the golf course and vineyard.

Agricultural pollutants and sediments have the potential to flow via catchment runoff from the regional drainage network and accumulate in drain water or discharge features such as coastal lakes. Potential contaminants may include suspended solids, nutrients, herbicides, pesticides and fertilizers.

4.10 Response to PER Guideline 5.3.40 – Submarine Groundwater discharge

Identify any submarine groundwater discharges along the coast and describe the extent to which potential contamination of groundwater (particularly from nutrients, herbicides, pesticides and agricultural chemical use) could impact on the surrounding marine environment in areas where such discharges occur.

Within the Unconfined Aquifer, groundwater flow is likely to be complex, owing to localised flow paths towards coastal lakes and other low-lying surface water features. In general, shallow groundwater at Nora Creina likely flows towards the coastal lakes, which act as regional groundwater discharge features for shallow groundwater in the Unconfined Aquifer. Deeper in the Unconfined Aquifer, groundwater is likely to discharge to the Southern Ocean via submarine discharge. The rates of discharge are unknown.

The coastal barrier dunes potentially form a groundwater divide and as such, some groundwater beneath these coastal dunes potentially flows towards the Southern Ocean. Given the limited storage of the coastal barrier dunes, the volume of discharge towards the Southern Ocean is likely to be small.

The regional groundwater flow direction in the deeper Confined Aquifer is likely to be westerly towards the Southern Ocean. Groundwater in the Confined Aquifer is likely to discharge to the Southern Ocean via submarine discharge. The volume and rates of discharge are unknown.

Development of the Border Groundwaters Agreement Review Committee with the State of Victoria resulted in several projects to better understand aquifer interaction. Interstate drilling investigations resulted in a three-dimensional model, which showed that there is moderate to good hydraulic connection between the Unconfined and Confined aquifers (South East NRM Board, 2013).

4.11 Response to PER Guideline 5.3.41 – Impact Avoidance

Identify impact avoidance, minimisation and mitigation measures and their effectiveness.

Refer to all other sections of this report which provide measures for environmental management of the site.

5. Risk & Hazard Management

This Chapter provides a response to PER Guidelines 5.9.5 and 5.9.6

5.1 Response to PER Guideline 5.9.5 – Pollution

Describe procedures to prevent, minimise and manage pollution

Pollution in the form of building waste will need to be managed during construction and a Construction Environment Management Plan (CEMP) is required to detail the responsible parties, measures required and procedures to follow. A site-wide Environmental Management Plan (EMP) is recommended for ongoing management of the sites waste streams and potentially polluting activities. This will be a live document that is amended as the site's configuration and practices change, and will detail the responsible parties, measures required and procedures to follow.

5.2 Response to PER Guideline 5.9.6 – Acid Sulfate Soils

Describe measures to avoid or mitigate potential impacts from the disturbance of any acid sulfate soils.

Acid Sulfate Soil Potential

A search of the Australian Soil Resource Information System (ASRIS) indicated the majority of the site is classified C4 – extremely low probability with very low confidence, with the north eastern portion of the site classified as A4 high probability with very low confidence of occurrences of acid sulfate soils at the site. The ASRIS map is provided in Appendix E. Given the sites geology is limestone it is considered highly unlikely that acid sulfate soils are actually present. An Acid Sulfate Soil Management Plan (ASSMP) is recommended should development include excavation of soils in the north east portion of the site, as shown in the ASRIS map. Typically, lime may be used to neutralise potential acid sulfate soils and sampling. If required, analytical testing of the target soils is undertaken in-situ to determine a liming rate during excavation.

6. References

- Baker-Gabb, D and M Weston (2006) South Australian Recovery Plan for the Hooded Plover *Thinornis rubricollis*. Department of Environment and Heritage.
- Barren Environmental (2014) Flora and Fauna Survey Methodology Recommendation for Scanlon, Nora Creina.
- Bird, E. (1993). The Coast of Victoria - The Shaping of Scenery. Melbourne: Melbourne University Press.
- Butler A., F Althaus, D Furlani and K Ridgway (2013) Assessment of the conservation values of the Bonney upwelling area: a component of the Commonwealth Marine Conservation Assessment Program 2002-2004 : report to Environment Australia
- DENR (2010) Environmental, Economic and Social Values of the upper South East Marine Park. Department of Environment and Natural Resources, South Australia.
- Geological Society of Australia. (2014). Robe Geological Trail, a self-drive geological trail. GSA, South Australian Division.
- Jenkins, GP, KP Black and PA Hamer (2000) Determination of spawning areas and larval advection pathways for King George Whiting in southeastern Australia using otolith microstructure and hydrodynamic modelling. I. Victoria. Marine Ecology Progress Series 199: 231-242
- Kendrick, G. A., Kirkman, H. & Burton, C. (1995) An Investigation Into Beach Cast Macro Algae and Marine Angiosperms. CSIRO Division of Fisheries Report.
- Mariani, A. et al. (2012). Generic Design Coastal Erosion Volumes and Setbacks for Australia. Hobart, Tasmania: Antarctic Climate & Ecosystems Cooperative Research Centre.
- National Oceans Office (2002a). A Summary Paper – Glimpses of the South-east Marine Region. The South-east Regional Marine Plan Assessment Reports. Commonwealth Government of Australia.
- Shepherd, S. (1981). Ecological Strategies in a Deep Water Algal Community. Botanica Marina.
- Wilson, B. R. & Allen, G. R. (1987). Major components and distribution of marine fauna. In: Dyne, G. R. & Walton, D. W. (eds) Fauna of Australia. General Articles. Volume 1A. Australian Government Publishing Service, Canberra: 43-68.

Appendices

Appendix A –Figures

Topographical Survey

Concept Plan



Nora Creina Golf Course

Robe, South Australia



harrison  Golf
PTY LTD

0 25 50 100 200 300 400
SCALE 1:4000

Appendix B - Current & Historical CT Information

Land Services Group

The Property Location Browser is available on the Land Services Group Website: www.sa.gov.au/landservices

Nora Creina CTs

Date created:

August 5, 2015



Government of South Australia

Department of Planning,
Transport and Infrastructure



Disclaimer: The information provided above, is not represented to be accurate, current or complete at the time of printing this report. The Government of South Australia accepts no liability for the use of this data, or any reliance placed on it.

CT6058/185
13/5/2010 - Current
R Ortner, S Dudley, D Scanlon & P Ortner

CT5972/519
11/10/2006-13/05/2010
D & J Scanlon

CT5825/993
24/11/00 - 11/10/2006

CT5957/987
9/02/2006 - 11/10/2006
D & J Scanlon

CT5957/989

CT5608/161
18/12/1998-9/02/2006

CT5826/457

CT5854/296
1/09/2001-9/02/2006

CT4067/190
1/07/1976-18/12/1998
D Wagner (Grazier), J Wright (Land
Salesman) & J Harvey (Company
Director)

CT4211/331
29/07/1983-9/02/2006
M McDonald (Grazier)

CT4024/480
27/08/1974-11/10/2006
G&E Blenkiron (Mixed Farmer)

CT4024/481

CT4024/479
27/08/1974
G & E Blenkiron (Mixed Farmer)

CT2289/7

CT928/67

CT1588/49
-29/07/1983

CT6071/913
9/02/2011-Current
J & D Scanlon

CT6009/541
13/05/2008-9/02/2011
J & D Scanlon

CT6058/186
13/05/2010-9/02/2011
T&C Haney

CT5972/522
J & D Scanlon

CT5972/523
11/10/2006-13/5/2008
D&J Scanlon

CT6009/542
13/05/2008-13/05/2010

CT5825/993
24/11/2000-11/10/2006

CT5957/987
9/02/2006 - 11/10/2006
D & J Scanlon

CT5957/988
9/02/2006-11/10/2006

CT5957/989

CT5530/40
1/05/1998-11/10/2006

CT5825/993
24/11/00 - 11/10/2006

CT5957/987
9/02/2006 - 11/10/2006
D & J Scanlon

CT5957/989

CT4024/480
27/8/1974-24/11/2000
G, E & W Blenkiron
(Mixed Farmer)

CT5608/161
18/12/1998-9/02/2006

CT5854/296
1/09/2001-9/02/2006

CT5608/161
18/12/1998-9/02/2006

CT5826/457

CT5854/296
1/09/2001-9/02/2006

CT4067/188
D & V Glazbrook (Farmer)

CT5608/161
18/12/1998-9/02/2006

CT4067/190
1/07/1976-18/12/1998
D Wagner (Grazier), J Wright (Land Salesman) & J Harvey (Company Director)

CT4211/331
29/07/1983-9/02/2006
M McDonald (Grazier)

CT4067/190
1/07/1976-18/12/1998
D Wagner (Grazier), J Wright (Land Salesman) & J Harvey (Company Director)

CT4211/331
29/07/1983-9/02/2006
M McDonald (Grazier)

CT4024/481

CT4067/190
1/07/1976-18/12/1998
D Wagner (Grazier), J Wright (Land Salesman) & J Harvey (Company Director)

CT4024/481

CT5826/457

CT4024/481

CT4024/479
27/08/1974
G & E Blenkiron (Mixed Farmer)

CT4024/480
27/08/1974-11/10/2006
G&E Blenkiron (Mixed Farmer)

CT4024/481

CT5826/457

CT2289/7

CT4024/479
27/08/1974
G & E Blenkiron (Mixed Farmer)

CT2289/7

CT1588/49
-29/07/1983

CT928/67

CT1588/49
-29/07/1983

CT4024/479
27/08/1974
G & E Blenkiron (Mixed Farmer)

CT928/67

CT928/67

CT6071/914
9/02/2011-Current
J & D Scanlon

CT5972/518
11/10/2006-9/02/2011

CT6009/541
13/05/2008-9/02/2011
J & D Scanlon

CT5825/993
24/11/2000-
11/10/2006

CT5957/987
9/02/2006 - 11/10/2006
D & J Scanlon

CT5957/989

CT5972/522
J & D Scanlon

CT5957/987
9/02/2006 - 11/10/2006
D & J Scanlon

CT4024/480
27/8/1974-24/11/2000
G, E & W Blenkiron (Mixed
Farmer)

CT5608/161
18/12/1998-9/02/2006

CT5608/161
18/12/1998-9/02/2006

CT5826/457

CT5854/296
1/09/2001-9/02/2006

CT5825/993
24/11/2000-11/10/2006

CT5608/161
18/12/1998-9/02/2006

CT5854/296
1/09/2001-9/02/2006

CT4067/190
1/07/1976-18/12/1998
D Wagner (Grazier), J Wright (Land Salesman) & J Harvey
(Company Director)

CT4067/190
1/07/1976-18/12/1998
D Wagner (Grazier), J
Wright (Land Salesman) & J
Harvey (Company Director)

CT4211/331
29/07/1983-9/02/2006
M McDonald (Grazier)

CT4024/480
27/8/1974-24/11/2000
G, E & W Blenkiron (Mixed
Farmer)

CT4067/190
1/07/1976-18/12/1998
D Wagner (Grazier), J Wright (Land Salesman) & J Harvey
(Company Director)

CT4211/331
29/07/1983-9/02/2006
M McDonald (Grazier)

CT4024/481

CT5826/457

CT4024/481

CT4024/479
27/08/1974
G & E Blenkiron (Mixed
Farmer)

CT4024/481

CT5826/457

CT2289/7

CT4024/479
27/08/1974
G & E Blenkiron (Mixed
Farmer)

CT4024/479
27/08/1974
G & E Blenkiron (Mixed
Farmer)

CT928/67

CT1588/49
-29/07/1983

CT2289/7

CT1588/49
-29/07/1983

CT928/67

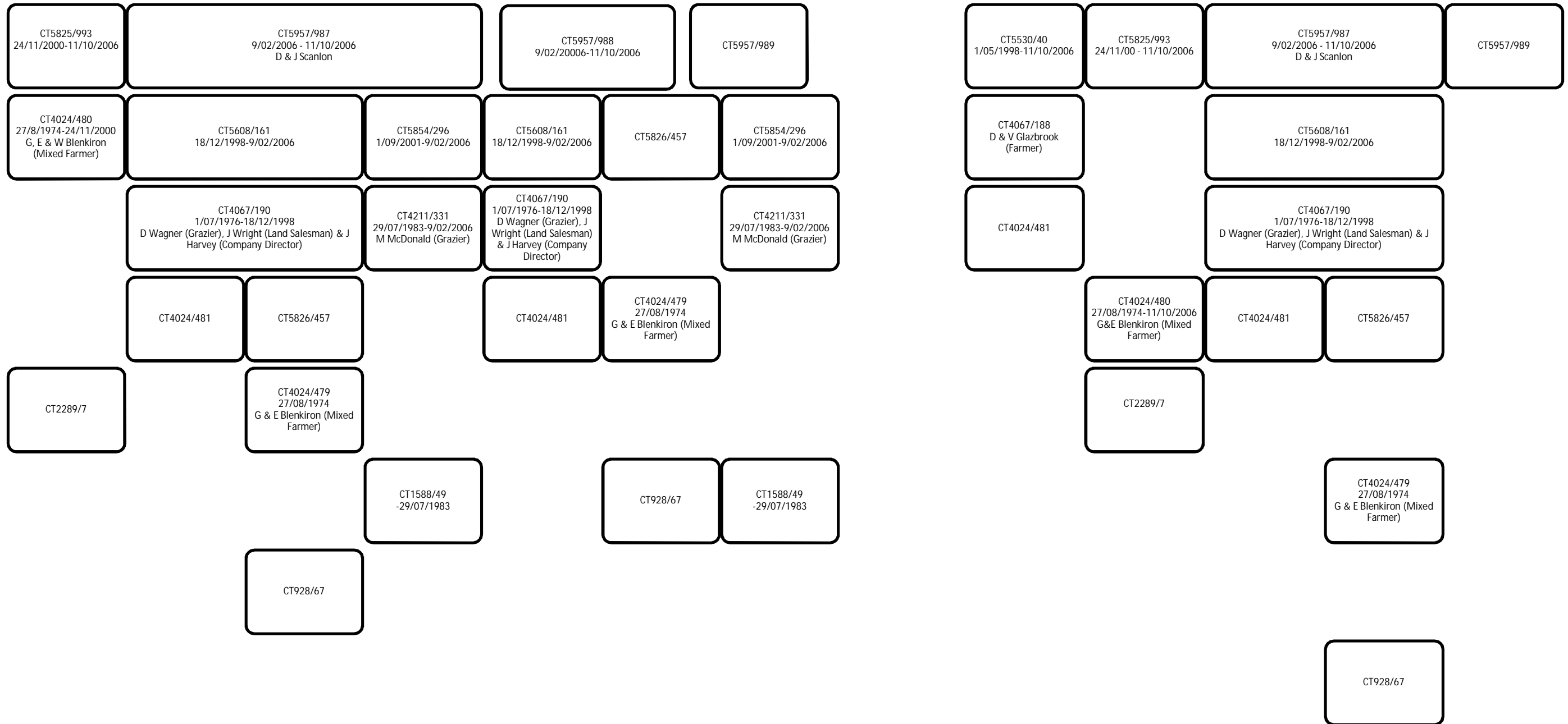
CT928/67

CT6071/915

CT6009/541
13/05/2008-9/02/2011
J & D Scanlon

CT5972/522
J & D Scanlon

CT5972/523
11/10/2006-13/5/2008
D&J Scanlon



Development Plan

Robe Council

Consolidated – 28 August 2014

Please refer to the Robe Council page at www.sa.gov.au/developmentplans to see any amendments not consolidated.



Government of South Australia
Department of Planning,
Transport and Infrastructure



Department of Planning, Transport and Infrastructure

Roma Mitchell House
136 North Terrace
Adelaide

Postal Address
GPO Box 1815
Adelaide SA 5001

Phone (08) 8303 0600
Fax (08) 8303 0782

Email dplgwebmaster@sa.gov.au
Internet www.dpti.sa.gov.au



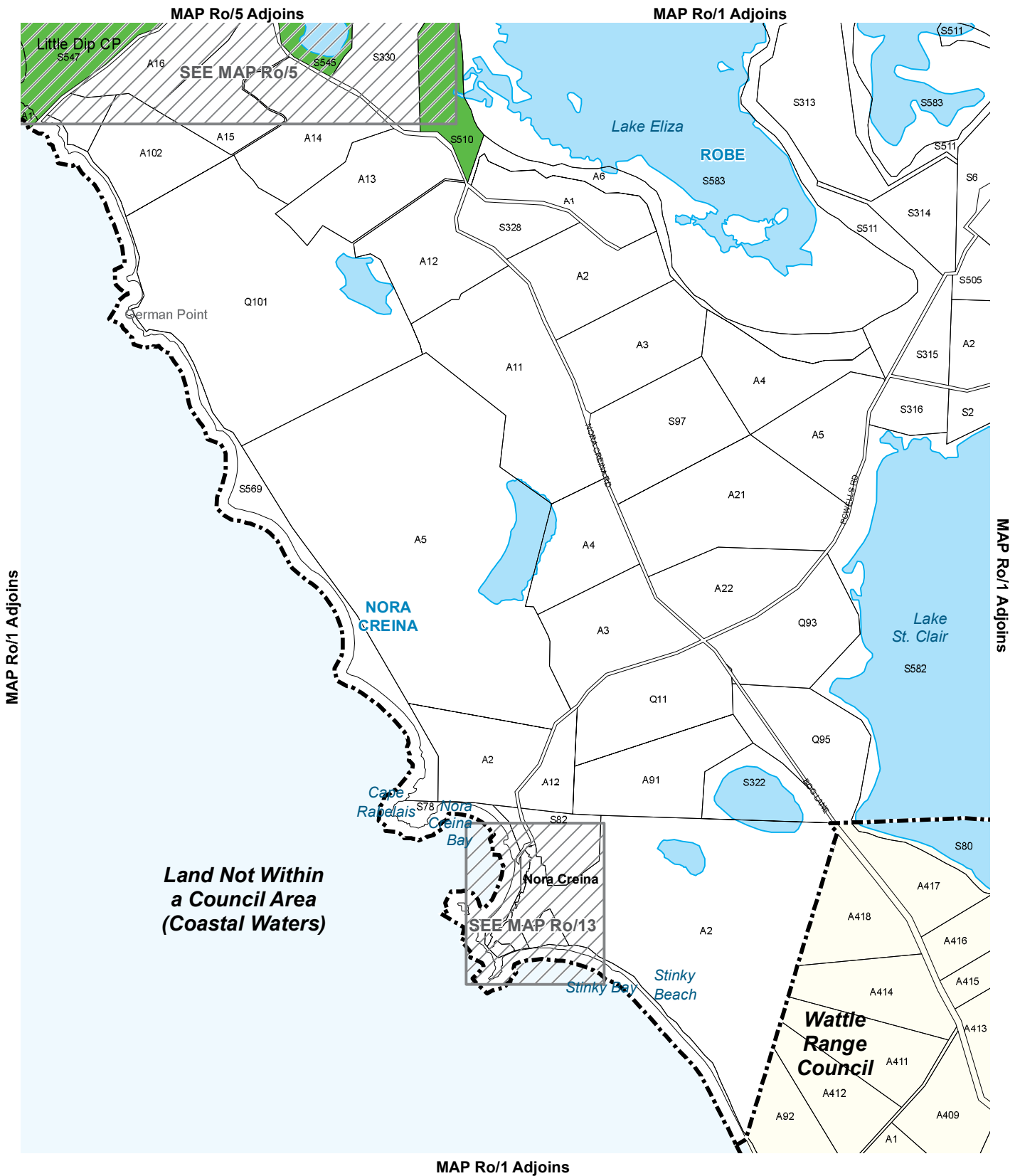
Robe Council

Royal Circus
Robe

Postal Address
PO Box 1
Robe SA 5276

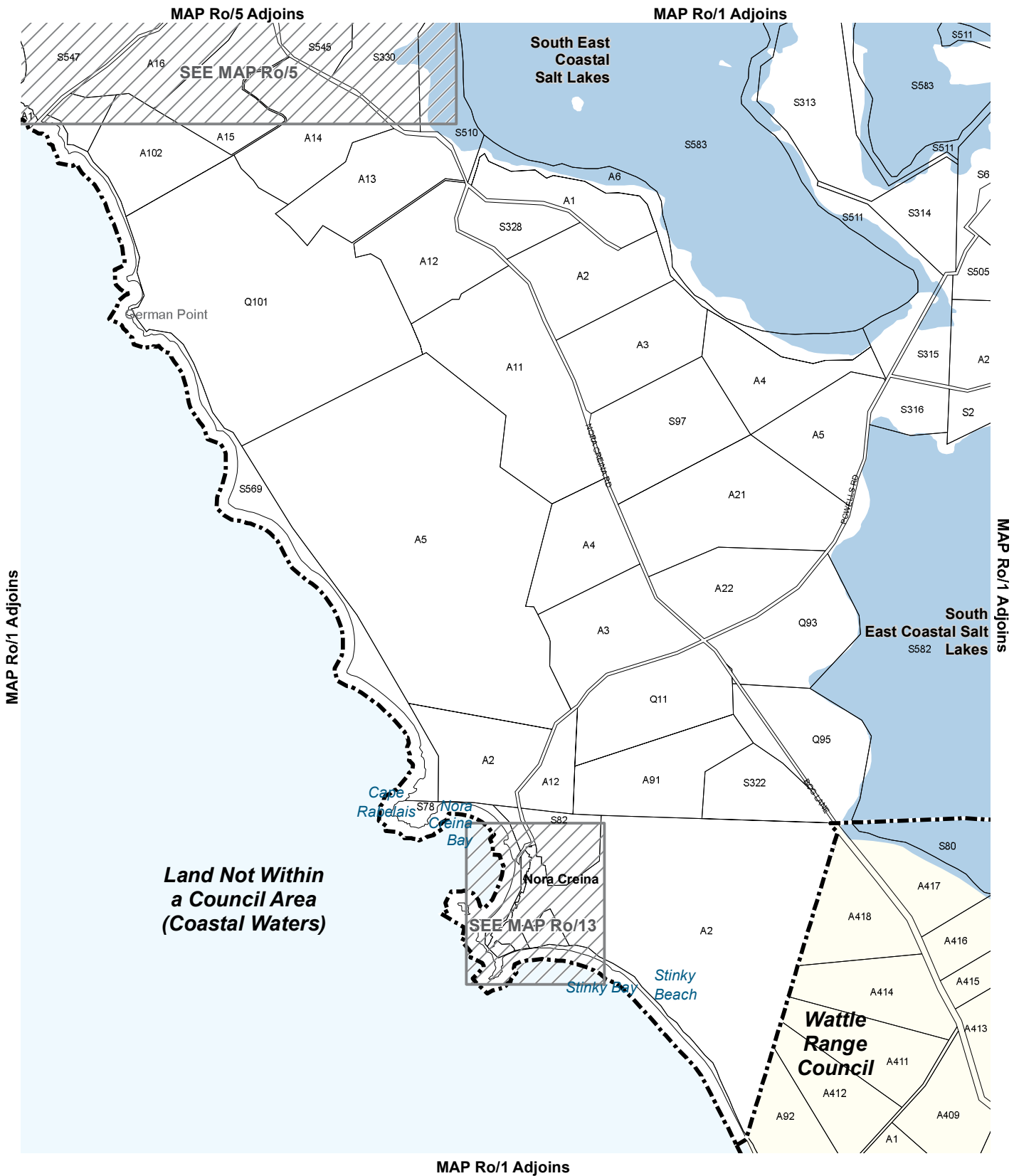
Phone (08) 8768 2003
Fax (08) 8768 2432

Email council@robe.sa.gov.au
Internet www.council.robe.sa.gov.au



Location Map Ro/6

- Conservation Park
- Waterbodies
- Development Plan Boundary

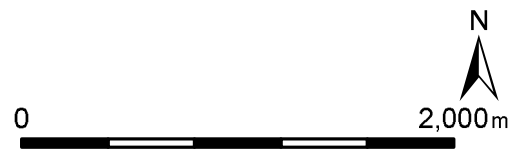


Land Not Within
a Council Area
(Coastal Waters)

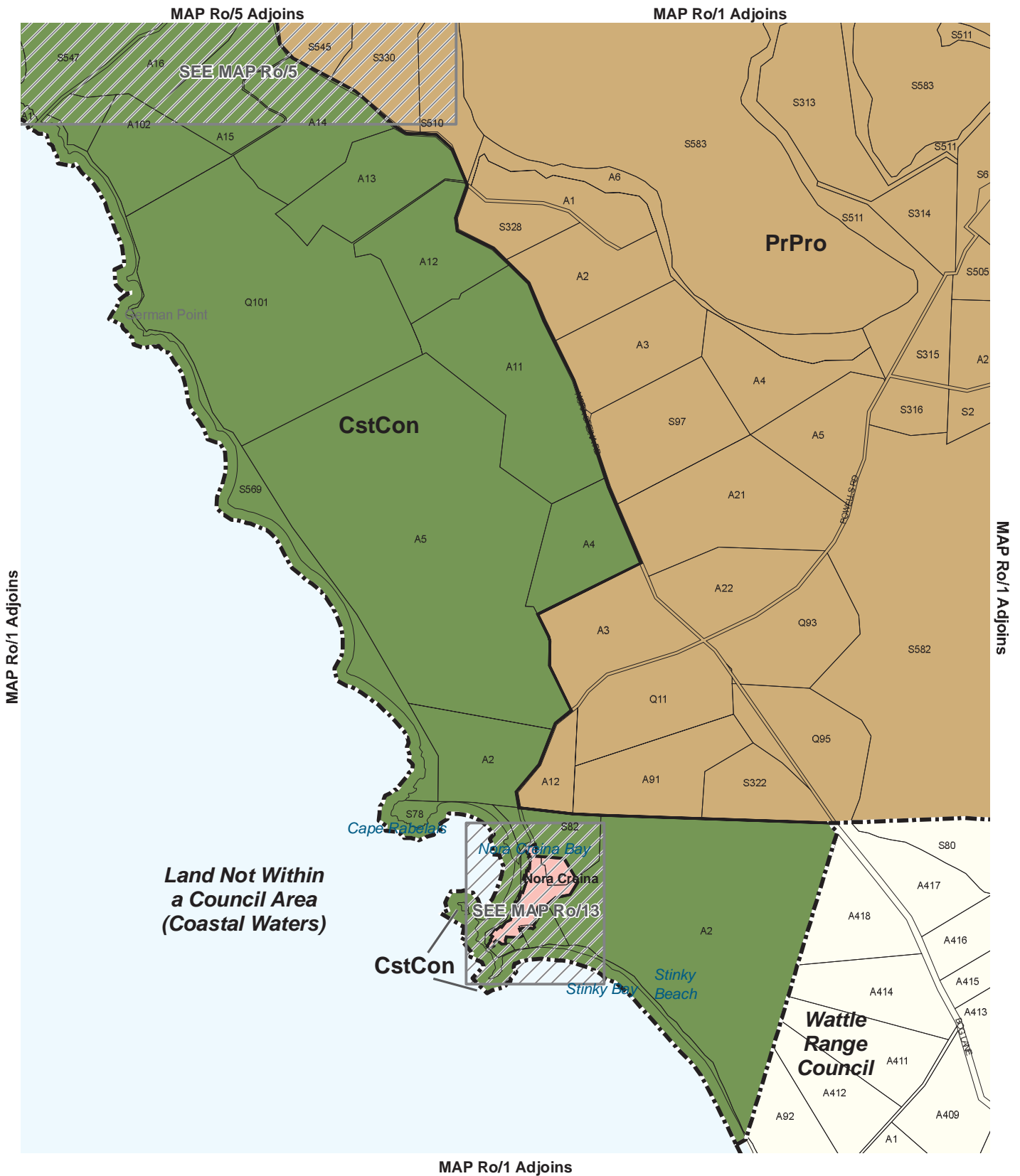
Wattle
Range
Council

Overlay Map Ro/6

NATURAL RESOURCES



- Wetlands of National Importance
- Development Plan Boundary



See enlargement map for accurate representation.
Lamberts Conformal Conic Projection, GDA94



Zone Map Ro/6

- Zones**
- CstCon Coastal Conservation
 - PrPro Primary Production
 - Zone Boundary
 - Development Plan Boundary

Appendix C - Historical Aerial Photographs

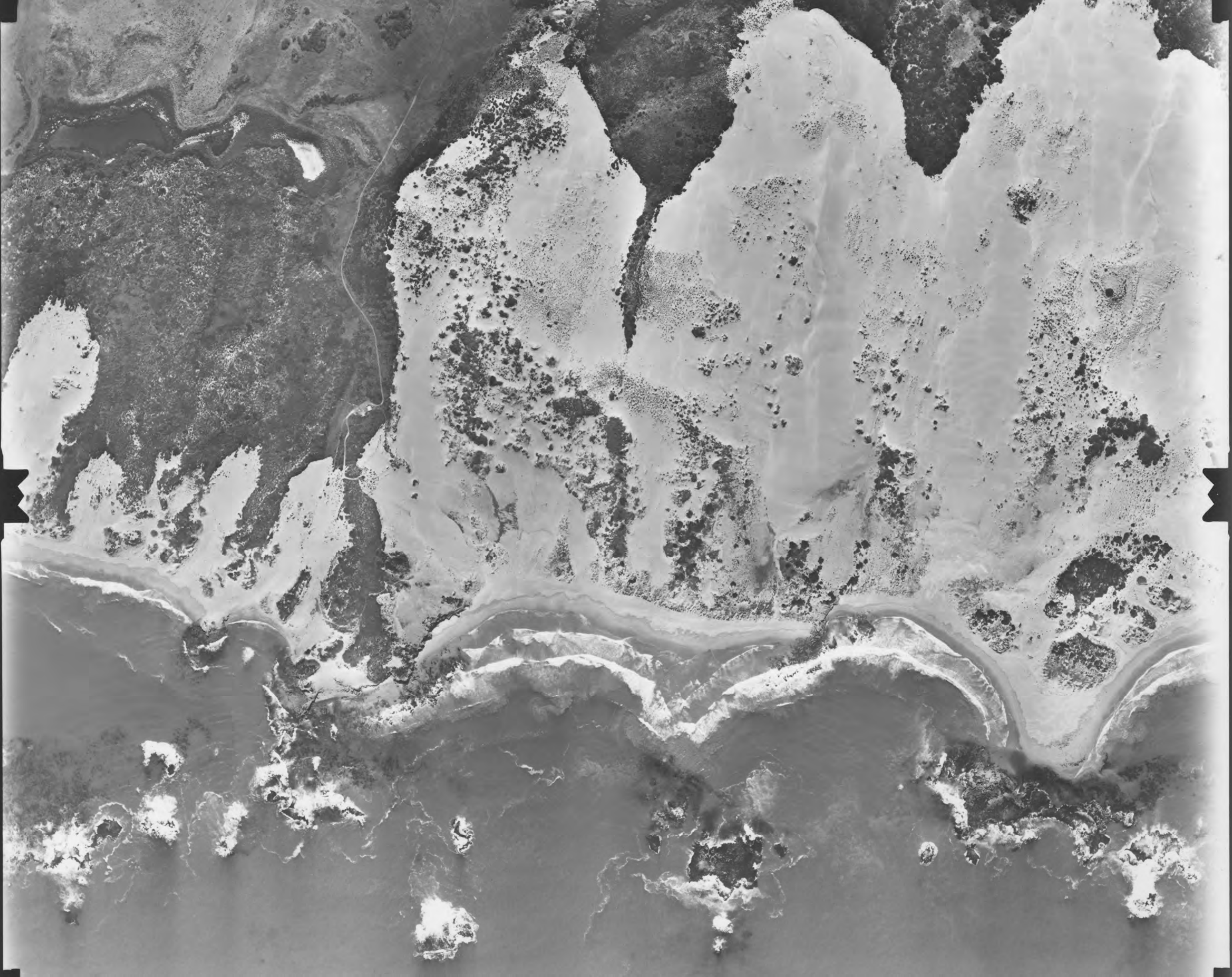




SVY
793
SA



11.5 Ag 21
5270
114.51



NO. 1,6922



3090m
1:10100



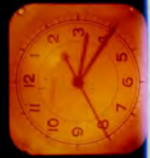
25.2.75



SVY. 1773
000-142



DEPT. OF
S.E. COAST





©
DENRSA
5271
SURVEY

PENOLA
STRAT
1:40000



269 1708

152.15



269 1708

152.15

0 0 4 3

031



5.8/350 FM000 0043

Appendix D - Search Results



13 August 2015

Ms Lexi Schwarz
GHD Pty Ltd
GPO Box 2052
ADELAIDE SA 5001

Licensing Unit

Level 4, World Park A,
33 Richmond Road
Keswick SA 5035

GPO Box 465
Adelaide SA 5001

DX 715 Adelaide

Phone (08) 8303 0400

Fax (08) 8303 9903

Email licensing@safework.sa.gov.au

ABN 50-560-588-327

www.safework.sa.gov.au

Dear Ms Schwarz

DANGEROUS SUBSTANCES LICENCE SEARCH

PROPERTY DETAILS: 1462 Nora Creina Road, NORA CREINA SA

Further to your dangerous substance licence search application dated 11 August 2015 for the abovementioned site, SafeWork SA's records show that it has no licensed items.

Yours sincerely

 **MANAGER
LICENSING AND AUTHORISATION UNIT
SAFEWORK SA**



13 August 2015

Ms Lexi Schwarz
GHD Pty Ltd
GPO Box 2052
ADELAIDE SA 5001

Licensing Unit

Level 4, World Park A,
33 Richmond Road
Keswick SA 5035

GPO Box 465
Adelaide SA 5001

DX 715 Adelaide

Phone (08) 8303 0400

Fax (08) 8303 9903

Email licensing@safework.sa.gov.au

ABN 50-560-588-327

www.safework.sa.gov.au

Dear Ms Schwarz

DANGEROUS SUBSTANCES LICENCE SEARCH

PROPERTY DETAILS: Lot 200 - 202 Nora Creina Road, NORA CREINA SA

Further to your dangerous substance licence search application dated 11 August 2015 for the abovementioned site, SafeWork SA's records show that it has no licensed items.

Yours sincerely

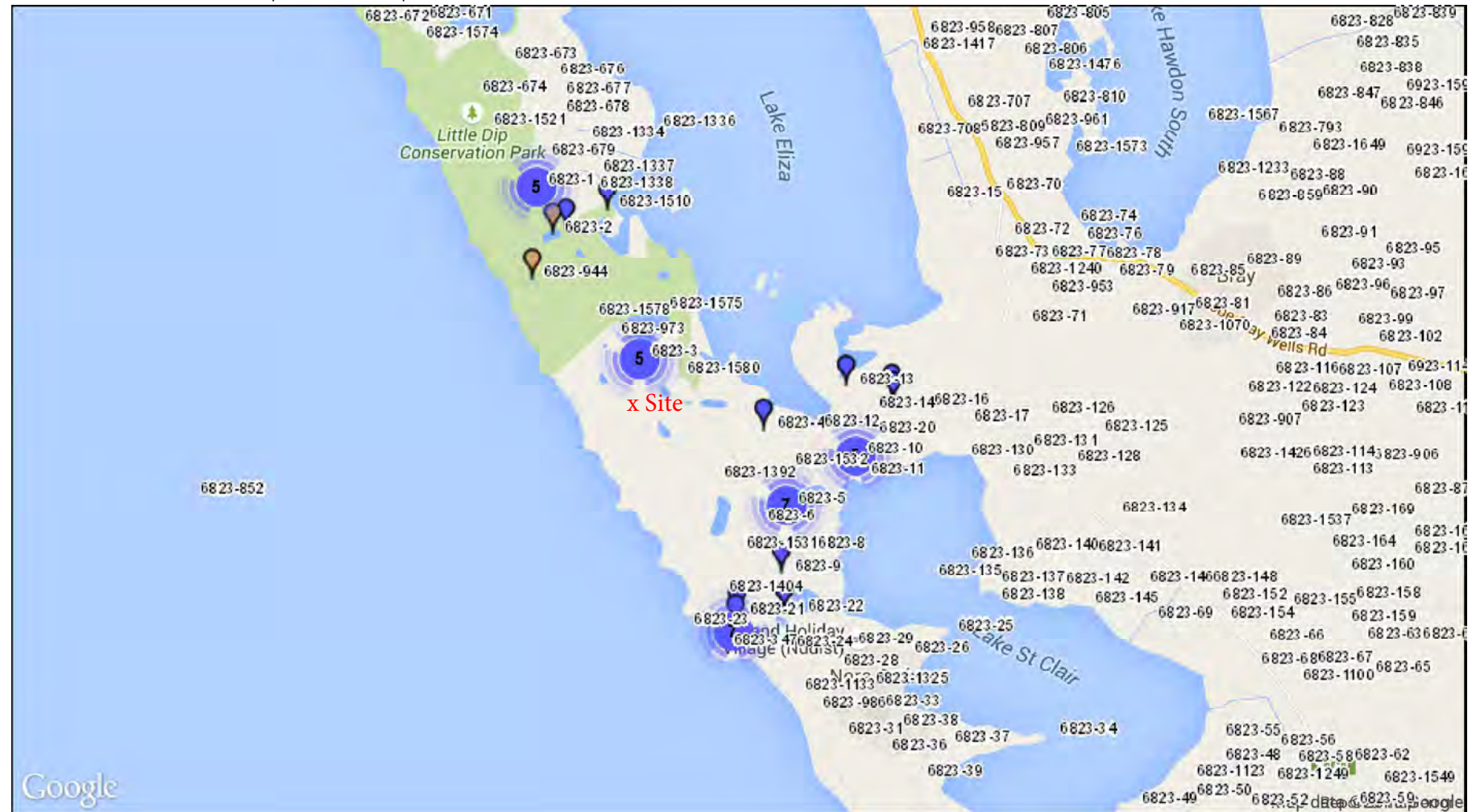
 **MANAGER
LICENSING AND AUTHORISATION UNIT
SAFEWORK SA**



Government of South Australia

WaterConnect

Circle Centre -37.285734,139.831628, Radius 5km



Except where otherwise noted this work is licensed under a [Creative Commons Attribution 3.0 Australia License](https://creativecommons.org/licenses/by/3.0/au/) © Crown in right of the State of South Australia



Unit_No	Unit_Number	Obs_No	drillhole_class	Aquifer	Orig_drilled_depth	Orig_drilled_date	max_drill_depth	max_drill_date	late_open_depth	late_open_date	late_permit_no	cased_to	case_min_diam	purpose	latest_status
6823-1	682300001		WWW		2.51		2.51		2.51						
6823-2	682300002		WP												
6823-3	682300003		WWW		6.91		6.91		6.91						
6823-4	682300004		WWW												
6823-5	682300005		WWW												
6823-6	682300006		WWW				6.1	9/06/1970	6.1	9/06/1970		3.05		102	
6823-7	682300007		WWW				7.01	26/11/1968	7.01	26/11/1968		7.01		152	
6823-8	682300008		WWW		12.19	16/04/1969	12.19	16/04/1969	12.19	16/04/1969		6.55		38 OBS	
6823-9	682300009		WWW												
6823-10	682300010	WAT002	WWW		42.67	12/05/1969	42.67	12/05/1969	42.67	12/05/1969		10.72		152 OBS	
6823-11	682300011		WP												
6823-12	682300012		WWW												
6823-13	682300013	WAT014	WWW												OBS
6823-18	682300018		WWW				3.66	26/11/1968	3.66	26/11/1968		3.66		152	
6823-20	682300020	WAT023	WWW				2.92	26/11/1968	2.92	26/11/1968		2.92		152 OBS	
6823-21	682300021		WWW				6.1	10/06/1969	6.1	10/06/1969		5.49		102	
6823-23	682300023		WWW				4.57	16/07/1969	4.57	16/07/1969		3.05		102	
6823-347	682300347		WWW		8	20/04/1977	8	20/04/1977	8	20/04/1977	1625	6.1		127 STK	OPR
6823-679	682300679		WWW											STK	OPR
6823-944	682300944		WP												
6823-973	682300973		WWW		9	24/05/1984	9	24/05/1984	9	24/05/1984	93584	7		127 DOM	OPR
6823-1047	682301047		WWW		4	27/09/1987	4	27/09/1987	4	27/09/1987	80602	3		102	
6823-1050	682301050		WWW		15	1/03/1988	15	1/03/1988	15	1/03/1988	18736	12		127	
6823-1158	682301158		WWW		8	6/03/1992	8	6/03/1992	8	6/03/1992	85934	1.45		150 STK	OPR
6823-1175	682301175		WWW				16.24	14/04/1993		14/04/1993	27771	9.14		152	
6823-1211	682301211		WWW		9	23/11/1994	9	23/11/1994	9	23/11/1994	27438	6.7		135	
6823-1324	682301324		WWW		5.7	28/04/1999	5.7	28/04/1999	5.7	28/04/1999	48437	5.7		150 DOM	
6823-1337	682301337		WWW				9.02	27/07/1999	9.02	27/07/1999				250 STK	OPR
6823-1338	682301338		WWW				1.8	27/07/1999	1.8	27/07/1999				100 STK	UEQ
6823-1339	682301339		WWW				4.25	27/07/1999	4.25	27/07/1999				152 STK	OPR
6823-1392	682301392		WWW		10.5	23/10/2001	10.5	23/10/2001	10	23/10/2001	56497	7.5		150 STK	
6823-1404	682301404		WWW		12	27/03/2002	12	27/03/2002	12	27/03/2002	57527	11		150 STK	
6823-1510	682301510		WWW				0.5	11/05/2006	0.5	11/05/2006	118914			INV	
6823-1530	682301530		WWW		18	2/07/2008	18	2/07/2008	18	2/07/2008	143332	6.5		152 STK	
6823-1531	682301531		WWW		15	9/07/2008	15	9/07/2008	15	9/07/2008	143342	12		200 STK	
6823-1532	682301532		WWW		18	3/07/2008	18	3/07/2008	18	3/07/2008	143341	6.5		152 STK	
6823-1578	682301578	WAT036	WWW		7	3/03/2009	7	3/03/2009	7	3/03/2009		7		50 MON	
6823-1577	682301577	WAT035	WWW		6	3/03/2009	6	3/03/2009	6	3/03/2009		6		50 MON	
6823-1575	682301575	WAT033	WWW		6	3/03/2009	6	3/03/2009	6	3/03/2009		6		50 MON	
6823-1580	682301580		WWW		11.4	30/06/2009	11.4	30/06/2009	11.4	30/06/2009	164046	11.4		150 STK	
6823-1582	682301582		WWW					3/08/2009	0	3/08/2009	166948				BKF
6823-1583	682301583		WWW					3/08/2009	0	3/08/2009	166948				BKF

latest_status_date	swl	rswl	water_level_date	TDS	EC	salinity_date	pH	pH_date	yield	yield_date	mga_easting	mga_northing	mga_zone	long_degrees	long_minutes	long_seconds	lat_degrees	lat_minutes
				1645	2967	1/12/1968	6.5	1/12/1968			394536.61	5876762.65	54	139	48	38.959	37	14
				3599	6404	22/10/1952					394866.61	5875861.68	54	139	48	51.895	37	15
	6.15		30/11/1968	2900	5186	30/11/1968	7	30/11/1968			396521.6	5873557.61	54	139	49	57.916	37	16
											398902.65	5872243.62	54	139	51	33.945	37	17
											399325.65	5870840.62	54	139	51	50.437	37	18
	3.05		9/06/1970	2426	4350	9/06/1970	7.5	9/06/1970			398746.64	5870483.66	54	139	51	26.746	37	18
	1.73		26/11/1968	7745	13441	26/11/1968	7	26/11/1968			400023.68	5870216.62	54	139	52	18.485	37	18
	1.22		27/07/1971	2900	5186	22/04/1969	6.5	22/04/1969			399709.6	5869984.61	54	139	52	5.615	37	18
											399266.61	5869545.65	54	139	51	47.407	37	18
	-11.09	9.47	3/01/1975	28196	44000	3/09/1974	6.5	3/09/1974			400611.66	5871790.61	54	139	52	43.126	37	17
				119809	140952	31/10/1952					400669.65	5871385.63	54	139	52	45.286	37	17
											400688.67	5872300.62	54	139	52	46.498	37	17
	1.48	-2.5	15/03/1977	11824	20000	17/03/1975	7.9	17/03/1975			400446.63	5873092.66	54	139	52	37.052	37	17
	1.83		26/11/1968								401312.67	5872234.65	54	139	53	11.806	37	17
	-12.99	11.11	18/09/1978	3712	6600	15/03/1977	7.4	15/03/1977			400838.62	5872177.67	54	139	52	52.528	37	17
	2.13		10/06/1969	5285	9300	18/07/1969	7.5	18/07/1969			398426.65	5868748.66	54	139	51	12.894	37	19
	1.83		20/06/1969	7355	12787	20/06/1969	7.5	20/06/1969			398400.6	5868544.61	54	139	51	11.735	37	19
	5		20/04/1977	1945	3500	20/04/1977	7.1	20/04/1977	0.5	20/04/1977	398339.64	5868463.65	54	139	51	9.219	37	19
											394605.66	5877309.68	54	139	48	42.041	37	14
				3691	6563	23/06/1982	8.2	23/06/1982			394474.66	5874996.68	54	139	48	35.544	37	15
	6		24/05/1984	1216	2200	24/05/1984	7.5	24/05/1984	3.75	24/05/1984	395959.64	5873955.67	54	139	49	35.3	37	16
	0		14/10/1987	5109	9000	14/10/1987	6.5	1/01/1987			398213.64	5868550.66	54	139	51	4.143	37	19
	4		1/03/1988	2795	5000	1/03/1988	7.2	1/01/1988	0		398217.66	5868540.61	54	139	51	4.302	37	19
	6		17/03/1992	3080	5500	17/03/1992			4	6/03/1992	399310.64	5868810.61	54	139	51	48.836	37	19
	2.13		4/05/1993	1580	2851	4/05/1993			1.3	14/04/1993	398246.71	5868352.55	54	139	51	5.389	37	19
				17906	29300	6/12/1994			2.25	23/11/1994	398201.52	5868337.58	54	139	51	3.546	37	19
	3		28/04/1999	5692	9990	28/04/1999			1.75	28/04/1999	398271.66	5868457.61	54	139	51	6.454	37	19
27/07/1999			27/07/1999	2738	4900	23/10/2007					395561.63	5877077.63	54	139	49	20.719	37	14
27/07/1999			27/07/1999								395531.66	5876997.7	54	139	49	19.462	37	14
27/07/1999			27/07/1999	2824	5050	23/10/2007					394911.66	5877227.63	54	139	48	54.417	37	14
	3		23/10/2001	2014	3620	23/10/2001			3	23/10/2001	398918.99	5871314.01	54	139	51	34.153	37	17
	6.2		27/03/2002	15370	25500	27/03/2002			1.25	27/03/2002	398049	5869147	54	139	50	57.75	37	19
	0.3		11/05/2006								395891	5876340	54	139	49	33.715	37	15
	11.5		2/07/2008	11074	18800	2/07/2008			1	2/07/2008	399361	5870949	54	139	51	51.926	37	18
	2		9/07/2008	13743	23000	9/07/2008			1.5	9/07/2008	399090	5870288	54	139	51	40.596	37	18
	11		3/07/2008	11963	20200	3/07/2008			1	3/07/2008	400125	5871553	54	139	52	23.248	37	17
	1.28		6/10/2011								396161	5874330	54	139	49	43.663	37	16
	2.88		27/02/2013	4195	7433	27/02/2013	5.92	27/02/2013			395127	5875962	54	139	49	2.515	37	15
	1.11		27/02/2013	75462	94327	27/02/2013	5.94	27/02/2013			396868	5874447	54	139	50	12.424	37	16
	7.05		30/06/2009	7347	12750	30/06/2009			1.75	30/06/2009	397206	5873380	54	139	50	25.614	37	16
3/08/2009											401333	5872796	54	139	53	12.9	37	17
3/08/2009											401307	5872927	54	139	53	11.907	37	17

lat_seconds	decimal_long	decimal_lat	neg_decimal_lat	hundred	plan	parcel	Title	map_250k	map_100k	map_50k	map_10k	map_2_5k	map_1k	water_info	salinity	water_chemistry	geophys_log	drill_log	lith_log
58.98	139.8108221	37.2497167	-37.2497167	WATERHOUSE	H441800	S547	CR 5550 691	SJ5406	6823	1	24 r		5 N	Y	N	N	N	N	
28.345	139.8144152	37.2578737	-37.2578737	WATERHOUSE	H441800	S547	CR 5550 691	SJ5406	6823	2	27 a		5 N	Y	N	N	N	N	
43.765	139.8327543	37.2788236	-37.2788236	WATERHOUSE	D70078	A14	CT 5972 519	SJ5406	6823	2	27 k		1 Y	Y	N	N	N	N	
27.339	139.8594292	37.2909274	-37.2909274	WATERHOUSE	D69649	A3	CT 5976 600	SJ5406	6823	2	27 p		2 N	N	N	N	N	N	
13.023	139.8640103	37.3036174	-37.3036174	WATERHOUSE	H441800	S318	CT 5976 600	SJ5406	6823	2	34 c		2 N	N	N	N	N	N	
24.377	139.8574295	37.3067715	-37.3067715	WATERHOUSE	D24258	A4	CT 5378 7	SJ5406	6823	2	34 c		6 Y	Y	N	N	N	N	
33.539	139.8718013	37.3093164	-37.3093164	WATERHOUSE	F208139	Q93	CT 5436 752	SJ5406	6823	2	34 c		4 Y	Y	N	N	N	N	
40.944	139.8682264	37.3113734	-37.3113734	WATERHOUSE	F208139	Q93	CT 5436 752	SJ5406	6823	2	34 c		4 Y	Y	N	N	N	N	
55.013	139.8631686	37.3152815	-37.3152815	WATERHOUSE	F38240	Q11	CT 5497 755	SJ5406	6823	2	34 f		2 N	N	N	N	N	N	
42.699	139.878646	37.2951942	-37.2951942	WATERHOUSE	H441800	S316	CT 5412 192	SJ5406	6823	2	27 n		6 Y	Y	N	Y	N	N	
55.861	139.8792461	37.2988502	-37.2988502	WATERHOUSE	H441800	S582	CR 5647 293	SJ5406	6823	2	27 n		6 N	Y	N	N	N	N	
26.182	139.8795829	37.2906062	-37.2906062	WATERHOUSE	H441800	S315	CT 5412 192	SJ5406	6823	2	27 n		1 N	Y	N	N	N	N	
0.392	139.8769588	37.2834421	-37.2834421	WATERHOUSE	H441800	S314	CT 5412 192	SJ5406	6823	2	27 m		6 Y	Y	N	N	N	N	
28.562	139.8866128	37.2912671	-37.2912671	WATERHOUSE	D30275	A2	CT 5436 717	SJ5406	6823	2	27 n		2 Y	N	N	N	N	N	
30.229	139.8812579	37.2917302	-37.2917302	WATERHOUSE	D30275	A2	CT 5436 717	SJ5406	6823	2	27 n		1 Y	Y	N	N	N	N	
20.542	139.8535818	37.3223727	-37.3223727	LAKE GEORGE	H420900	S82	CT 5435 297	SJ5406	6823	2	34 f		6 Y	Y	N	N	N	N	
27.151	139.8532598	37.3242087	-37.3242087	LAKE GEORGE	H420900	S82	CT 5435 297	SJ5406	6823	2	34 f		6 Y	Y	N	N	N	N	
29.754	139.8525609	37.3249317	-37.3249317	LAKE GEORGE	D45790	A2	CT 5579 465	SJ5406	6823	2	34 f		6 Y	Y	N	N	N	N	
41.261	139.811678	37.2447946	-37.2447946	WATERHOUSE	D14046	A12	CT 5059 653	SJ5406	6823	1	24 r		5 N	N	N	N	N	N	
56.249	139.8098734	37.2656248	-37.2656248	WATERHOUSE	H441800	S547	CR 5550 691	SJ5406	6823	2	27 h		2 N	Y	N	N	N	N	
30.625	139.8264723	37.2751737	-37.2751737	WATERHOUSE	D70078	A16	CT 5972 521	SJ5406	6823	2	27 k		1 Y	Y	N	N	N	N	
26.881	139.8511509	37.3241337	-37.3241337	LAKE GEORGE	D29806	Q53	CR 5750 516	SJ5406	6823	2	34 f		6 Y	Y	N	N	N	N	
27.209	139.8511949	37.3242247	-37.3242247	LAKE GEORGE	D29806	Q53	CR 5750 516	SJ5406	6823	2	34 f		6 Y	Y	N	N	N	N	
18.878	139.8635657	37.3219105	-37.3219105	LAKE GEORGE	D45790	A2	CT 5579 465	SJ5406	6823	2	34 f		5 Y	Y	N	N	N	N	
33.322	139.8514969	37.3259227	-37.3259227	LAKE GEORGE	D45790	A2	CT 5579 465	SJ5406	6823	2	34 l		1 Y	Y	N	N	N	N	
33.79	139.8509849	37.3260527	-37.3260527	LAKE GEORGE	H420900	S78	CR 5629 602	SJ5406	6823	2	34 l		1 N	Y	N	N	Y	N	
29.923	139.8517929	37.3249787	-37.3249787	LAKE GEORGE	D45790	A2	CT 5579 465	SJ5406	6823	2	34 f		6 Y	Y	Y	N	Y	N	
49.177	139.8224219	37.2469935	-37.2469935	WATERHOUSE	D47616	A6	CT 5503 749	SJ5406	6823	1	24 r		4 Y	Y	N	N	N	N	
51.758	139.8220729	37.2477105	-37.2477105	WATERHOUSE	D47616	A6	CT 5503 749	SJ5406	6823	1	24 r		4 Y	N	N	N	N	N	
44.047	139.8151159	37.2455686	-37.2455686	WATERHOUSE	D47616	A4	CT 5503 749	SJ5406	6823	1	24 r		5 Y	Y	N	N	N	N	
57.505	139.859487	37.299307	-37.299307	WATERHOUSE	H441800	S97	CT 5976 600	SJ5406	6823	2	27 p		5 Y	Y	N	Y	Y	N	
7.469	139.849375	37.3187414	-37.3187414	WATERHOUSE	D24257	A2	CT 5435 299	SJ5406	6823	2	34 g		3 Y	Y	N	N	Y	N	
13.241	139.8260319	37.2536781	-37.2536781	WATERHOUSE	H441800	S545	CR 5550 691	SJ5406	6823	2	27 b		1 Y	N	N	N	Y	N	
9.52	139.8644239	37.3026444	-37.3026444	WATERHOUSE	H441800	S318	CT 5976 600	SJ5406	6823	2	34 c		2 Y	Y	Y	N	Y	N	
30.86	139.8612767	37.3085721	-37.3085721	WATERHOUSE	H441800	S319	CT 5976 600	SJ5406	6823	2	34 c		5 Y	Y	Y	N	Y	N	
50.22	139.8731243	37.2972835	-37.2972835	WATERHOUSE	D69649	A5	CT 5976 600	SJ5406	6823	2	27 p		4 Y	Y	Y	N	Y	N	
18.561	139.8287954	37.2718225	-37.2718225	WATERHOUSE	H441800	S545	CR 5550 691	SJ5406	6823	2	27 g		6 Y	N	N	N	Y	N	
25.196	139.8173652	37.2569989	-37.2569989	WATERHOUSE	H441800	S547	CR 5550 691	SJ5406	6823	2	27 a		4 Y	Y	N	Y	Y	N	
15.048	139.8367844	37.2708468	-37.2708468	WATERHOUSE	H441800	S545	CR 5550 691	SJ5406	6823	2	27 g		5 Y	Y	N	N	Y	N	
49.8	139.8404485	37.2805001	-37.2805001	WATERHOUSE	H441800	S330	CT 5608 721	SJ5406	6823	2	27 k		2 Y	Y	N	N	Y	N	
10.356	139.8869167	37.2862101	-37.2862101	WATERHOUSE	H441800	S4A	CT 5412 192	SJ5406	6823	2	27 m		5 N	N	N	N	N	N	
6.096	139.8866408	37.2850268	-37.2850268	WATERHOUSE	H441800	S4A	CT 5412 192	SJ5406	6823	2	27 m		5 N	N	N	N	N	N	

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6058 Folio 185
Address 1462 Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|----|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- e) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land. NO
- f) details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land NO
- g) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land. NO
- h) details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land? NO

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)? NO
- b) details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*? NO
- c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? NO
- d) a copy of a site contamination audit report? NO
- e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies? NO

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6071 Folio 913

Address Allotment 200 (D85108), Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|------|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- | | |
|---|----|
| c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. | NO |
| d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. | NO |
| e) details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to operate a waste depot at the land. | NO |
| f) details of a licence issued under the repealed <i>Waste Management Act 1987</i> to operate a waste depot at the land | NO |
| g) details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to produce waste of a prescribed kind (within the meaning of that Act) at the land. | NO |
| h) details of a licence issued under the repealed <i>Waste Management Act 1987</i> to produce prescribed waste (within the meaning of that Act) at the land? | NO |

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- | | |
|--|----|
| a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the <i>Environment Protection Act 1993</i>)? | NO |
| b) details of site contamination notified to the EPA under section 83A of the <i>Environment Protection Act 1993</i> ? | NO |
| c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? | NO |
| d) a copy of a site contamination audit report? | NO |
| e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the <i>Environment Protection Act 1993</i> applies? | NO |

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6071 Folio 914

Address Allotment 201 (D85108), Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|------|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- | | |
|---|----|
| c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. | NO |
| d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. | NO |
| e) details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to operate a waste depot at the land. | NO |
| f) details of a licence issued under the repealed <i>Waste Management Act 1987</i> to operate a waste depot at the land | NO |
| g) details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to produce waste of a prescribed kind (within the meaning of that Act) at the land. | NO |
| h) details of a licence issued under the repealed <i>Waste Management Act 1987</i> to produce prescribed waste (within the meaning of that Act) at the land? | NO |

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- | | |
|--|----|
| a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the <i>Environment Protection Act 1993</i>)? | NO |
| b) details of site contamination notified to the EPA under section 83A of the <i>Environment Protection Act 1993</i> ? | NO |
| c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? | NO |
| d) a copy of a site contamination audit report? | NO |
| e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the <i>Environment Protection Act 1993</i> applies? | NO |

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6071 Folio 915

Address Allotment 202 (D85108), Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|------|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- e) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land. NO
- f) details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land NO
- g) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land. NO
- h) details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land? NO

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)? NO
- b) details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*? NO
- c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? NO
- d) a copy of a site contamination audit report? NO
- e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies? NO

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6058 Folio 185
Address 1462 Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|----|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- e) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land. NO
- f) details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land NO
- g) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land. NO
- h) details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land? NO

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)? NO
- b) details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*? NO
- c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? NO
- d) a copy of a site contamination audit report? NO
- e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies? NO

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6071 Folio 913

Address Allotment 200 (D85108), Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|----|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- e) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land. NO
- f) details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land NO
- g) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land. NO
- h) details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land? NO

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)? NO
- b) details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*? NO
- c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? NO
- d) a copy of a site contamination audit report? NO
- e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies? NO

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6071 Folio 914

Address Allotment 201 (D85108), Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|----|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| | i) a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| | ii) activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| | iii) any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- e) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land. NO
- f) details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land NO
- g) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land. NO
- h) details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land? NO

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)? NO
- b) details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*? NO
- c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? NO
- d) a copy of a site contamination audit report? NO
- e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies? NO

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

GHD
Level 4
211 Victoria Square
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@epa.sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@epa.sa.gov.au

12 August, 2015

Dear Sir/Madam,

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6071 Folio 915

Address Allotment 202 (D85108), Nora Creina Road, NORA CREINA SA 5276

I advise as follows:

**PARTICULARS OF MORTGAGES, CHARGES PRESCRIBED ENCUMBRANCES
AFFECTING THE LAND**

9.1	Environment performance agreement under section 59 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.1	Environment protection order issued under section 93 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.2.2	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
9.3	Clean-up order issued under section 99 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.4	Clean-up authorisation issued under section 100 of the <i>Environment Protection Act 1993</i> that is registered in relation to the land.	NO
9.5.1	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

9.5.2	Section 103J - Site remediation order that is registered in relation to the land.	NO
9.5.3	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
9.5.4	Section 103P - Notation of site contamination audit report in relation to the land.	NO
9.5.5	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

Section 7 - Land and Business (Sale and Conveyancing) Act 1994

3) Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

- | | | |
|------|--|----|
| a) | details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |
| b) | details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land- | |
| i) | a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or | NO |
| ii) | activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act)? | NO |
| iii) | any other prescribed activity of environmental significance under Schedule 1 of that Act? | NO |

- c) details of a current exemption issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- d) details of an exemption that are no longer enforced, issued under Part 6 of the Environmental Protection Act 1993 from the application of a specified provision of that Act in relation to an activity carried on at the land. NO
- e) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land. NO
- f) details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land NO
- g) details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land. NO
- h) details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land? NO

4) Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- a) details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)? NO
- b) details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*? NO
- c) a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? NO
- d) a copy of a site contamination audit report? NO
- e) details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies? NO

- | | |
|---|----|
| f) details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | NO |

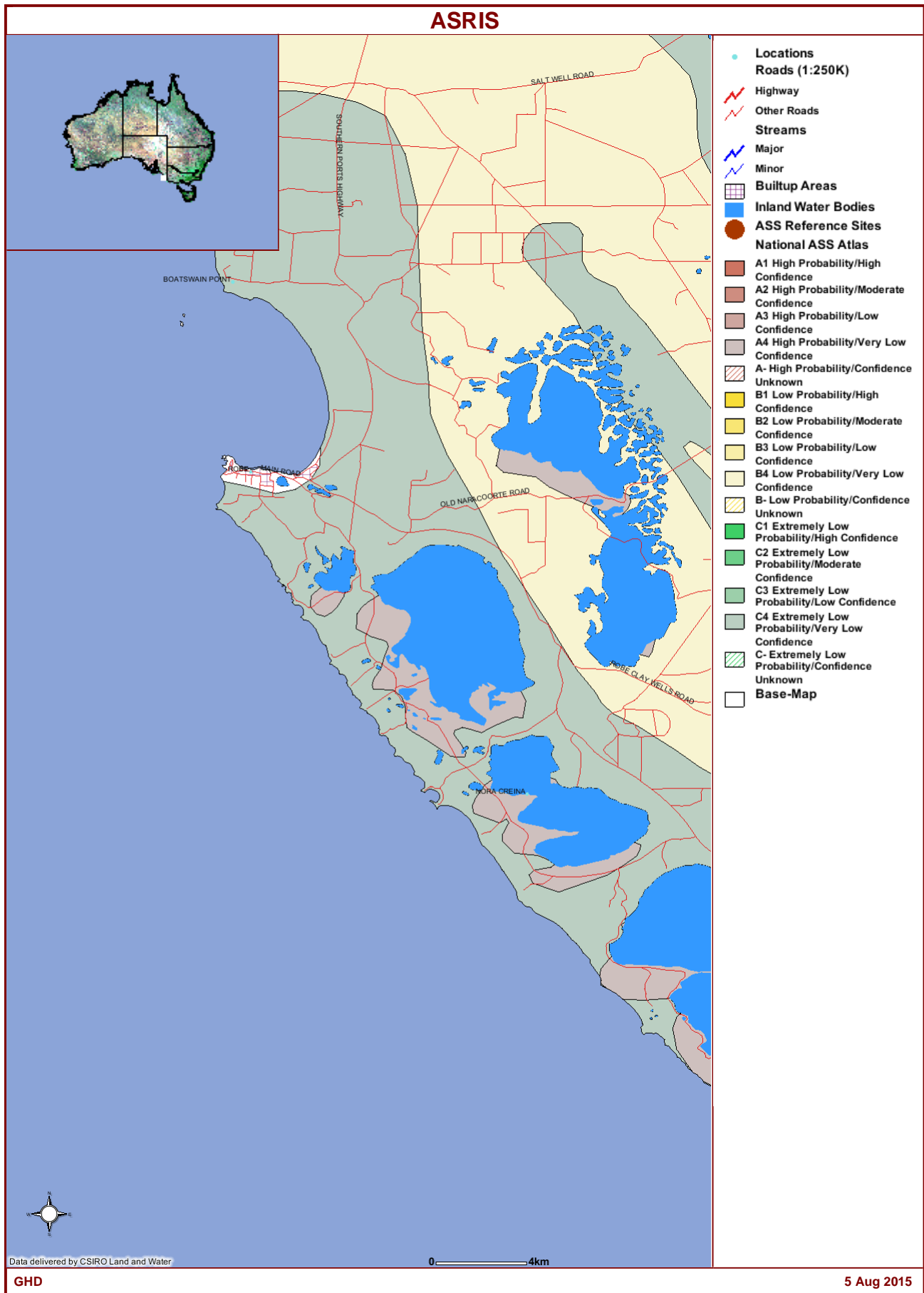
5) Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | |
|---|----|
| a) a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
| b) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) a copy of a pre-1 July 2009 site audit report? | NO |
| e) details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

Appendix E - ASRIS Map



Appendix F - Site Photographs

Item	Photograph
1	
2	
3	

Item	Photograph
4	
5	
6	

Item **Photograph**

7



8



9



Item	Photograph	
10	 A photograph showing a dense wooded area. Several trees with light-colored bark and bare branches are visible. In the foreground, a green plastic barrel is partially visible on the right side. The ground is covered with dry leaves and some green undergrowth.	
11	 A photograph of a wide, flat grassy field. The grass is a mix of green and yellowish-brown, suggesting some dryness. In the distance, there is a line of trees under a sky filled with large, white and grey clouds. The overall scene is a rural landscape.	
12	 A photograph of a grassy field, similar to the one in item 11. The grass is green and yellow. In the background, there is a dense line of trees. The sky is a clear blue with large, white, fluffy clouds. The lighting suggests a bright day.	

Item	Photograph
------	------------

13



14



15



Item **Photograph**

16









17






18



Item	Photograph	
19		
20		
21		

Item	Photograph
22	 A photograph showing a rugged coastline. In the foreground, there are large, layered rock formations in shades of brown and tan. The ocean is a vibrant turquoise color, with white foam from breaking waves crashing against the rocks. The sky is a pale, overcast blue.
23	 A wide-angle photograph of a coastal landscape. The foreground is dominated by dense, low-lying green vegetation. A narrow strip of golden sand beach runs along the edge of the water. The ocean is a deep blue-green, with white surf visible. The sky is bright blue with scattered white clouds.
24	 A photograph taken from an elevated position looking down at a coastal area. The foreground is filled with dense green and greyish vegetation. Below, a wide, sandy beach stretches along the coast. The ocean is visible in the distance under a bright, slightly overcast sky.

Item	Photograph
25	
26	
27	

Item	Photograph
28	 A photograph showing a rocky coastline. In the foreground, there are large, light-colored rocks and patches of sand. The ocean waves are breaking against the shore, creating white foam. In the background, a hillside covered in green vegetation rises up.
29	 A photograph of a wide, sandy beach. The sand is a light tan color. In the distance, there is a line of dunes covered in green vegetation. The sky is a clear, bright blue with a few small clouds.
30	 A photograph of a rocky, vegetated dune area. The ground is covered with light-colored rocks and sparse green plants. In the background, there is a line of dunes covered in dense green vegetation. The sky is blue with white clouds.

Item	Photograph
31	 A photograph showing a sandy path that leads from a grassy dune area down to the ocean. The path is flanked by dry, yellowish-brown grasses. The ocean is visible in the background with white-capped waves breaking under a sky filled with grey and white clouds.
32	 A wide-angle photograph of a coastal dune landscape. The foreground and middle ground are covered in dense, green, low-lying vegetation. In the distance, a sandy beach meets the ocean under a blue sky with scattered white clouds.
33	 A photograph of a dune slope. The foreground is dominated by large, dark grey rocks and patches of dry, brownish vegetation. The slope rises towards the right, covered in similar sparse vegetation under a clear sky.

Item	Photograph	
34		
35		
36		

GHD

Level 4 211 Victoria Square Adelaide SA 5000
GPO Box 2052 Adelaide SA 5001 Australia
T: 61 8 8111 6600 F: 61 8 8111 6699 E: adlmail@ghd.com

© GHD 2015

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

G:\33\17974\WP\58699.docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	B. Roman/ K. O'Malley- Jones/T.Wills	D.Petch/G.Lutton		G.Lutton		11/09/2015
O	B. Roman/ K. O'Malley- Jones/T.Wills	D.Petch/G.Lutton		G.Lutton		23/09/2015

www.ghd.com



Nora Creina Golf Course and Tourism Resort

Public Environmental Report

Economic Issues

September 2015

Introduction

Hudson Howells has been engaged to prepare a report on the Economic Issues to satisfy the requirements of the Guidelines for the preparation of a Public Environmental Report for the Nora Creina Golf Course and Tourism Resort. The purpose of this report is to address the specific economic requirements of the Guidelines issued by the Minister for Planning under the Development Act 1993, whereby the development has been declared a *Major Development* under the Act.

Due to the myriad of issues identified that need to be addressed as part of the development concept, an application was forwarded to the Minister for Planning seeking determination of the Nora Creina Development as a Major Project in accordance with the provisions of Section 46-48 of the Development Act. The application to seek major project status was on the basis of the issues of significant environmental, social and economic importance. These issues have implications for the existing residents of Robe, the service town of the District Council of Robe, State Government, business interest, as well as service infrastructure authorities.

As a result of the application, the Minister formally declared the development proposal as a major project in accordance with section 46 (1) of the Development Act 1993, as the Minister was of the opinion that a declaration under that section is appropriate for the proper assessment of the Nora Creina Development due to major environmental, social and economic importance. This report addresses the Economic Issues in the Guidelines for the PER.

However, it is highlighted that the Nora Creina Project represents a major regional project that is consistent with the State Government's Strategic Plan and Economic Development Framework. In particular, it offers an opportunity to diversify a regional economy that has traditionally been heavily reliant upon primary industries, thereby generating a new range of business and employment opportunities to offset the changing structure of the rural economy. Also consistent with the State's Strategic Plan, it provides an opportunity to increase the regional population base and contribute to the State's population strategy.

Tourism and Investment

The Nora Creina Project will be a major stimulus to tourism and investment in the Robe and broader Limestone Coast region. Tourism assets of this nature add value to the existing attractions of the region and it is expected that the project will attract both tourists who would normally visit Robe, plus new international and domestic visitors to the region. The development will offer immediate opportunities for investment in the Robe region itself and it is also expected to offer investment opportunities for existing and new businesses in Robe, the nearest service centre.

The scope of opportunities is expected to cover the needs of tourists and regional industries including wine and food, especially beef and aquaculture. The Nora Creina Development will complement existing tourism, industry and residential assets and will add significantly to the region's tourism assets. The project is also timed well to coincide with the marketing of a range of self-drive itineraries between Melbourne and Adelaide. This journey links the established tourist icon of the Great Ocean Road and products along the Great Southern Touring Route to Adelaide via South Australia's Limestone Coast, Murraylands, Adelaide Hills, Fleurieu Peninsula and Kangaroo Island regions. There is potential to sell touring products along this route to build the business profile of travel to the regions en-route.

Employment and Investment Opportunities

This section of the report details the employment and investment opportunities associated with the Nora Creina Project including 'multiplier' impacts as measured by employment and value added (salaries, wages and profits). These impacts cover all aspects of the project including both the construction and operational phases. All economic impacts are taken into consideration including those employment and investment opportunities that might arise as a consequence of the project.

The multiplier (or downstream) impacts are important in the context of total regional and Statewide impacts of the project. They recognise that there will be 'leakage' of expenditure associated with the project to other regions (Adelaide, South East and possibly Western Victoria) and that the economic impacts reach further than the immediate region.

Project Contribution to Economic Development

The Nora Creina Development has the potential to provide a major economic stimulus to the Robe and broader Limestone Coast region as a tourism and commercial project. This section of the report provides estimates of the economic impact that the project could have on the regional economy over the lifetime of the project including both the Development and Operational Phases of the project.

A Microsoft Excel model has been developed to assess the economic impacts and an Input – Output methodology has been employed to model the impact of the development on the regional economy. 2011/12 Input - Output Tables for the Limestone Coast Region of South Australia have been sourced as a methodology for assessing the economic impacts.

This economic impact assessment has been undertaken to identify the potential jobs and incomes that may be associated with the Nora Creina Development. Job and income creation are critical elements of the social agenda for economic regions. Economic and social development are intertwined and there is a very strong correlation between economic growth and social indicators (e.g. unemployment and crime rates). An accepted methodology for measuring economic outcomes, and one that is used nationally and internationally, is to measure the value added and employment associated with investment or turnover outcomes.

Value added is defined as the extent to which the local economy adds value to the product supplied, and essentially is the returns to labour and capital in the region for that activity – it represents the incomes to labour and capital. It is consistent with the predominant national measure of economic activity of Gross Domestic Product.

This value added and employment impact can be measured at two levels. Firstly there is the direct impact – the value added and employment contribution or share associated directly with the expenditure (e.g. the labour and profits involved in construction activity). Secondly there is the indirect or multiplier impact – for example that associated with the suppliers to the construction service and the spend of wages. The following construction multipliers have been obtained from the Input – Output Tables for the Limestone Coast Region and for South Australia (As this assessment is based on the Limestone Coast region, adjustments have to be made for ‘leakage’ of economic activity from the region as in future people employed in the region and on this project may reside elsewhere in South Australia).

Table 1		
Construction Sector Multipliers¹		
(\$2011/12)		
	Limestone Coast	South Australia
Employment (per \$ million)	6.56	8.682
Value Added (\$ million)	0.661	1.107

The above multipliers mean that \$1 million of construction output (in 2011/12) would have resulted in the employment of 6.56 persons in the Limestone Coast region (directly and through the multiplier effects) and 8.682 persons in total for South Australia. The value added or GRP (salaries, wages and profits) associated with this activity would have been \$661,000 and \$1,107,000 respectively.

The following sections of this report estimate the employment and value added impacts of the Nora Creina Project on the region, based on the above multipliers. The following additional notes and assumptions are made:

¹ 2011/12 Input - Output Tables for the Limestone Region of South Australia, Econsearch

- Value added is defined as returns to capital and labour (i.e.: salaries, wages and profits).
- Employment is defined as full time equivalent (FTE) employees.
- As the Input-Output tables were prepared in 2011/12, they do not incorporate movements in the value of money (inflation) since that time. Without adjustment, this would result in an overestimation of the number of jobs generated per \$1m of increased production. A deflator of 2% p.a. is considered appropriate and is applied to new expenditures to adjust for inflation during the period 2012 - 2015.
- There may also have been structural and other changes in the regional economy during this time which are not reflected in the tables. For example, structural reform may have improved the efficiency of some industries thereby leading to shifts in the relationships between economic inputs and outputs.
- The Input-Output Tables provide multipliers across a broad range of industries. For the purposes of this assessment the construction sector's multipliers have been used as it is assumed that the majority of expenditure will go into capital works and other construction related economic activity.

Development (Construction) Economic Impacts

It is assumed that the development phase of the project will take in the order of 5 years to complete. The key components of the project, including preliminary estimates of construction costs², include:

- External Infrastructure – Services infrastructure and headworks including:

² Cost estimates are based on preliminary estimates provided by the project proponents and the golf course designer, Harrison Golf.

- Power (SA Power Networks) - \$3 million
 - Water (Artesian and Bore) - \$0.5 million
 - Communications - \$0.5 million
- Internal Infrastructure – Roads, footpaths, fencing, septic, etc. - \$1 million
 - Golf Course Development (Course 1) - \$5 million
 - Golf Course Development (Course 2) - \$5 million
 - Club House, Reception and Accommodation - \$5 million
 - **Total - \$20 million (or an average of \$4 million per annum over 5 years)**

The following table details the calculation of economic impacts associated with this investment at the State and Limestone Coast Region levels. These are per annum estimates based on the estimated investment in the project over the first 5 years.

Table 2		
Total Construction Economic Impacts³ (Per Annum Over 5 Years)		
	Limestone Coast Region	South Australia
Employment per annum (Full Time Equivalent jobs after adjusting for inflation since 2011/12)	25 FTE Jobs	33 FTE Jobs
Value Added or Contribution to Gross State Product per annum (Salaries, Wages and Profits)	\$2.644 million	\$4.428 million

³ These economic impacts include the direct value added and employment impacts, plus the flow through effects as estimated using the RISE model– as reported in Econsearch “Economic and Environmental Indicators for South Australia and its Regions, 2006/07” Report for DTED, March 2009 – with employment impacts adjusted for inflation

It is important to note that the above estimates indicate the total gross impact of the project but it is not an indication of the benefits and costs of the project from a community wide perspective. For example, subject to demand, equivalent tourism facilities could occur in alternative locations in South Australia.

In summary, over the expected 5 year construction period there are good and sustainable employment and value added (salaries, wages and profits) benefits that the project could generate for the Limestone Coast region, Robe and South Australia. During the development phase, employment associated with the project is expected to peak at 33 FTEs with value added reaching \$4.428 million. There is a challenge to ensure that the Robe region captures as much of this economic benefit as possible by putting in place appropriate strategies that assist local companies and individuals to prepare themselves for the employment opportunities associated with the project.

The Operational Phase

The economic contribution to be made by the Nora Creina Project when operational will depend on the nature and scale of the final development. Operational impacts are therefore assessed on estimates of increased tourism and associated spending directly associated with the project, rather than estimating operational employment

2013 tourism data for the Robe District Council and are summarised below⁴:

- International Visitors – 11,400
- International Visitor Nights – 21,700
- Average International Visitor Stay – 1.9 nights
- Average Spend per Night - \$86.40
- Average Spend Accommodation per Night - \$114.10

⁴ Tourism in Local Government Areas, Tourism Research Australia 2013

- Domestic Overnight Visitors – 87,200
- Domestic Visitor Nights – 314,600
- Average Domestic Visitor Stay – 3.6 nights
- Average Spend per Night - \$130.70
- Average Spend Accommodation per Night - \$150.10

If it is conservatively assumed that the Robe region will attract an additional 2% of international visitors and 5% of domestic visitors (as a consequence of the Nora Creina Development and improved tourism promotion), it is estimated that this could result in the following **conservative, or Low Case**, additional tourism numbers and annual spend:

International Visitors

- Additional 228 visitors per annum (4 per week).
- Additional spend of \$86,856

Domestic Visitors

- Additional 4,360 visitors per annum (84 per week).
- Additional spend of \$4.4 million

Total Visitors

- Additional 4,588 visitors per annum.
- Additional spend of \$4.5 million

The above estimates are considered very conservative on the basis that similar projects (e.g. Barnbougle Dunes in Tasmania) attract in the order of 30,000 – 40,000 individual rounds of golf per annum. It has been estimated⁵ that the development attracts as many as 80,000 total visitors a year.

⁵ www.examiner.com.au

Conservative/Low Case Scenario

Conservatively assuming an additional 4,588 international and domestic visitors per annum attracted to Nora Creina, and each visitor playing twice, this represents a conservative estimated 9,176 rounds of golf per annum, or an average of 25 rounds per day.

The overall economic impact of the development in full operation is difficult to estimate as the nature of future tourism and other industry development at Nora Creina is unsure but, may also include tourism products based on regional strengths such as:

- Restaurant and bars.
- Vineyards and winery.
- Wagyu beef growing.
- Wellness and spa centre.

Also, longer term strategies of Council and the developers will contribute significantly to such impacts. However, as already noted, the Input-Output Tables for the Limestone Coast Region provide multipliers across a broad range of industries to assess potential future operational economic impacts of Nora Creina (over and above the construction impacts).

Accommodation and Food Services is considered the best industry sector to approximate operational economic impacts at Nora Creina. This sector has the following multipliers:

Table 3		
Accommodation and Food Services Sector Multipliers⁶		
(\$2011/12)		
	Limestone Coast	South Australia
Employment (per \$ million)	9.969	11.56
Value Added (\$ million)	0.798	1.187

⁶ 2011/12 Input - Output Tables for the Limestone Region of South Australia, Econsearch

The following table details the calculation of operational economic impacts associated with the spend by additional tourists at the State and Limestone Coast Region levels.

Table 4 Conservative or Low Case (9,176 Rounds Per Annum) Total Operational Economic Impacts⁷ (Per Annum)		
	Limestone Coast Region	South Australia
Employment per annum (Full Time Equivalent jobs after adjusting for inflation since 2011/12)	45 FTE Jobs	52 FTE Jobs
Value Added or Contribution to Gross State Product per annum (Salaries, Wages and Profits)	\$3.591 million	\$5.341 million

In summary, and under the Low Case Scenario, when fully operational, employment associated with the Nora Creina Project is expected to be 52 FTEs with value added reaching \$5.341 million per annum.

Target Case Scenario

As noted above, Barnbougle Dunes in Tasmania is a benchmark project with similar characteristics to that proposed for Nora Creina. Barnbougle attracts in the order of 30,000 – 40,000 individual rounds of golf per annum and as many as 80,000 total visitors a year. The following Target Case operational economic impacts are estimated assuming that Nora Creina attains 30,000 rounds of golf per annum (more than three times that of the Low Case):

⁷ These economic impacts include the direct value added and employment impacts, plus the flow through effects as estimated using the RISE model– as reported in Econsearch “Economic and Environmental Indicators for South Australia and its Regions, 2006/07” Report for DTED, March 2009 – with employment impacts adjusted for inflation

Table 5		
Target Case (30,000 Rounds Per Annum)		
Total Operational Economic Impacts⁸ (Per Annum)		
	Limestone Coast Region	South Australia
Employment per annum (Full Time Equivalent jobs after adjusting for inflation since 2011/12)	147 FTE Jobs	170 FTE Jobs
Value Added or Contribution to Gross State Product per annum (Salaries, Wages and Profits)	\$11.741 million	\$17.462 million

In summary, and under the Target Case Scenario, when fully operational, employment associated with the Nora Creina Project is expected to be 170 FTEs with value added reaching \$17.462 million per annum.

Nora Creina generated employment is likely to see job opportunities in the following categories:

- Golf Professionals
- Course Superintendent
- Green Keepers
- Maintenance Staff
- Retail Assistants
- Receptionists
- Chefs

⁸ These economic impacts include the direct value added and employment impacts, plus the flow through effects as estimated using the RISE model– as reported in Econsearch “Economic and Environmental Indicators for South Australia and its Regions, 2006/07” Report for DTED, March 2009 – with employment impacts adjusted for inflation

- Bar Staff and Waiters
- Cleaners
- Caterers
- Security

Attraction of Additional Business Operations

Existing regional businesses, especially tourism and other commercial businesses in Robe plus surrounding wineries, fishing and aquaculture businesses, will benefit and have the potential to be enhanced by new opportunities that will arise from the Nora Creina Project.

Existing tourism and commercial businesses (e.g.: retailers, wineries, service providers, etc.) will all have opportunities to benefit from increased demand associated with new tourists. Other industries (e.g.: fishing, aquaculture, industrial, etc.) will benefit from improved demand and infrastructure associated with the development itself.

Importantly, the extent to which existing businesses take advantage of these opportunities to enhance their own operations will depend on how they plan and prepare for the future. Failure by local businesses to seize opportunities could lead to new investment from outside the region.

Beyond the construction and operational economic impacts identified above, there is an opportunity for the Robe District Council, in association with other stakeholders, to put in place economic, industry and social development strategies to generate and leverage additional business and community benefits from the Nora Creina Project.

The overall objective of implementing economic and social development strategies in tandem with the Nora Creina Project would be to maximise business opportunities and sustainable employment growth which deliver social and environmental benefits to the Robe community. In doing so the region could capitalise on the new economic strengths associated with Nora Creina and the opportunities presented to develop and promote the region for the benefit of the community.

In addition to the above, there is an opportunity for the Robe community to identify potential future gaps in service provision that may represent future business development opportunities. Changing tourism demographics and demand profiles may represent opportunities for new or expanded services.

Infrastructure Costs

The infrastructure needs of the development, as estimated above, are significant and Council and the Nora Creina developers will be seeking support from State and Commonwealth Government Grant Programs in a number of areas including the supply of power and water to the development, along with required road upgrades.

It is stressed that such potential Government contributions should be considered in the broader context of the overall financial impacts on Government which would bring potential revenue streams (e.g.: stamp duty from property transactions, payroll tax, etc.) into calculations.

It is also important to note that, at the time of preparing this report, discussions have yet to commence with the State Government on project infrastructure implications and how Council, the developers and the State Government might best approach project requirements. It is difficult therefore to predict with any accuracy what the State Government might be asked to contribute to the development infrastructure and associated costs.



“

ag
arm

”



Contact
Dave Bickmore
dave@studio-gram.com.au
Graham Charbonneau
graham@studio-gram.com.au

studio-gram Pty Ltd
suite 406
33 Pirie Street
Adelaide SA 5000

T +61 8 8100 1007
hello@studio-gram.com.au
studio-gram.com.au
@studio_gram
ABN 66 167 317 339



Aerial photograph: Nora Creina, Robe South Australia

site context

The site is a significant landholding along the coastline between Robe and Beachport in South Australia. Nora Creina Golf Resort has the potential to be the one of the states major tourist destinations and be the catalyst project for the south-east region.

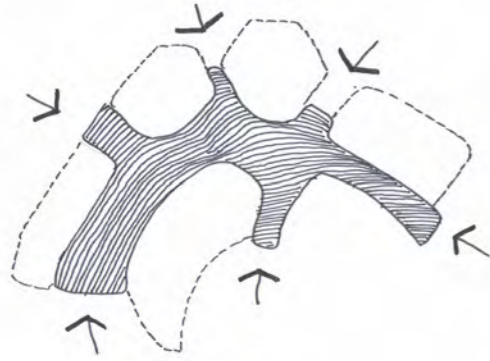
The proposal is for the development of an international standard, links style golf course and mixed tourism resort near Nora Creina (approximately 15 kilometres south of Robe) in the South East region of South Australia.

The Nora Creina Golf Resort comprises of two international standard golf courses, clubhouse, Boutique Wagyu Beef farm, Vineyard, recreational facilities (such as nature trails, fishing and diving), and Tourist accommodation complex, including restaurant and retail facilities.

The accommodation is anticipated to comprise three to five star hotel-style rooms and two seven star villas.

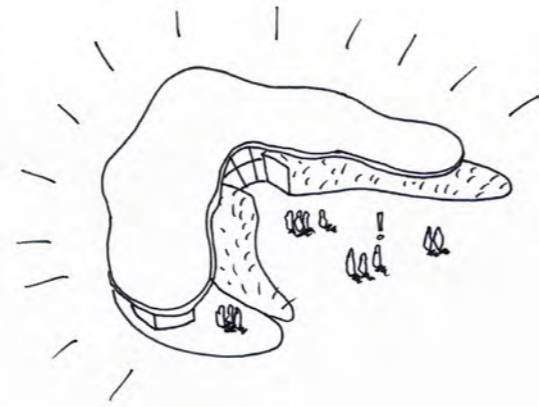


the design intent



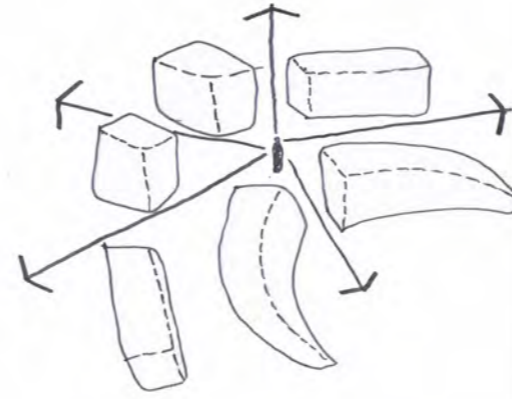
embracing the natural environment

The design uses the site contours to drive the form and layout of the building, minimising the amount of earthworks and disruption of flora and fauna. To integrate the building with the landscape, the design morphs the landform up and over building roof forms, allowing for dune movement and creating an Architecture that sits comfortably in the landscape.



a unique form

The building and landscape evoke the forms of the surrounding dunes, blurring the boundaries between the geometries of architecture and nature.



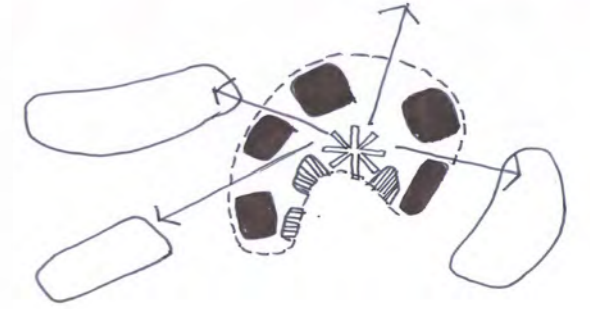
creating views

The buildings have been strategically positioned at key points throughout the site to provide uninterrupted views over both the North and South courses and coastline beyond.



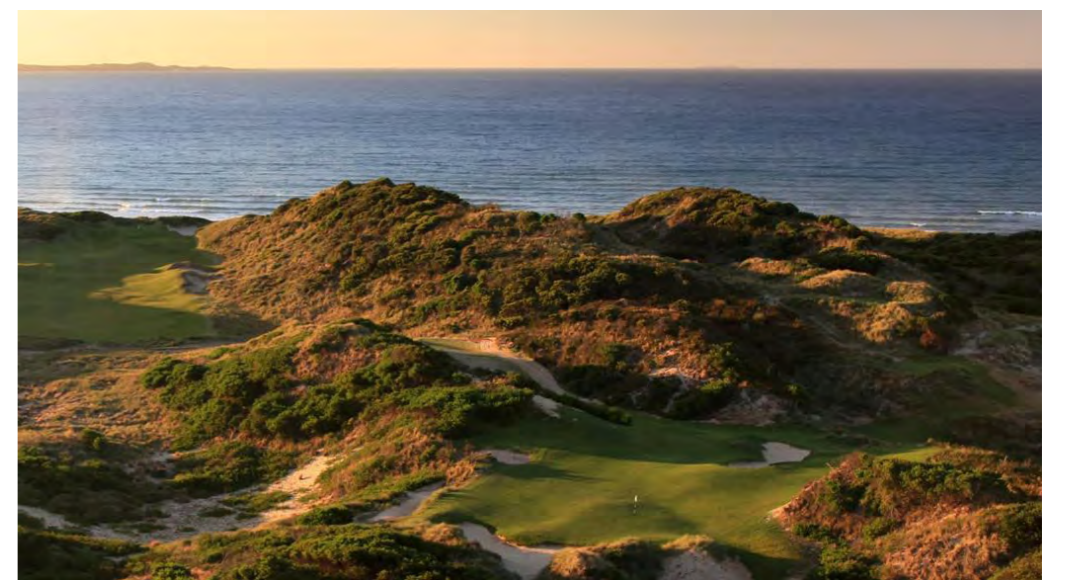
a sustainable lifecycle

Various ESD principles will be put in place, such as water collection & filtration to be re-used within and around the resort. Where possible, materials will be locally sourced, and of a low environmental impact quality.



an holistic experience

From the moment you enter the site from Nora Creina Road the experience begins. As you drive past the Cattle and Vineyard, the journey will create a series of experiences that start to embrace the location & sense of place. From the site entry, guests will begin the emotional 'wind-down' into the stress free resort environment, which culminates in the lobby lounge with views over the dunes to the ocean.

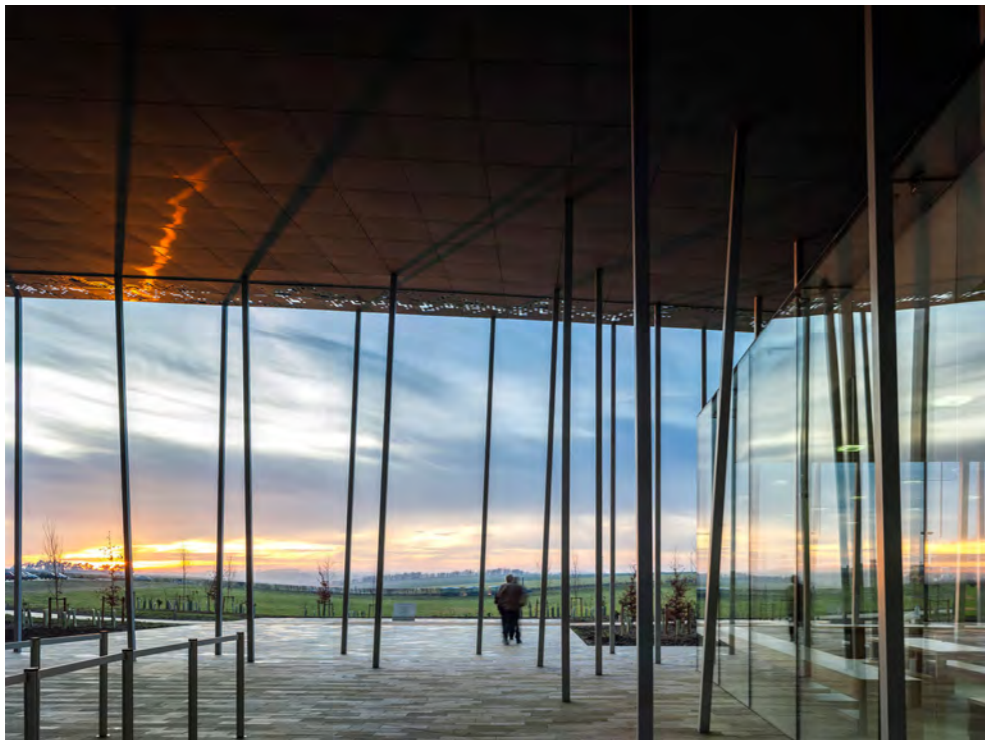
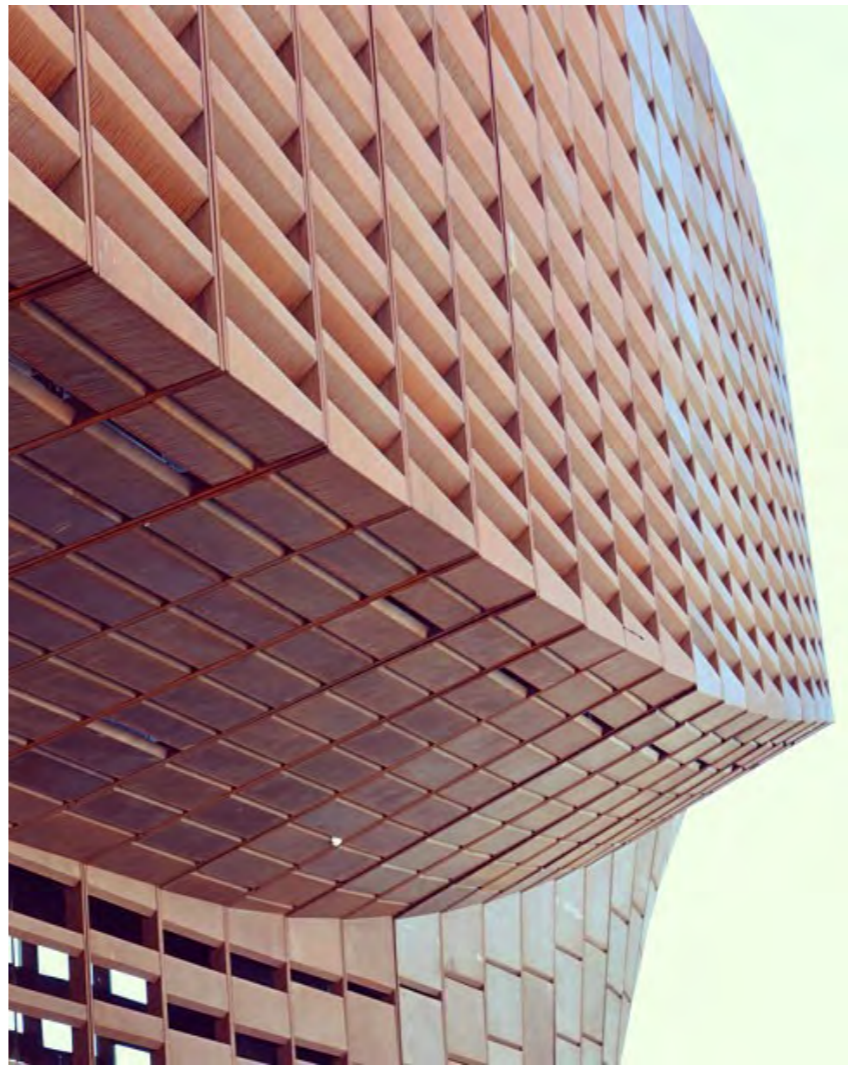


landscape precedents



aerial view



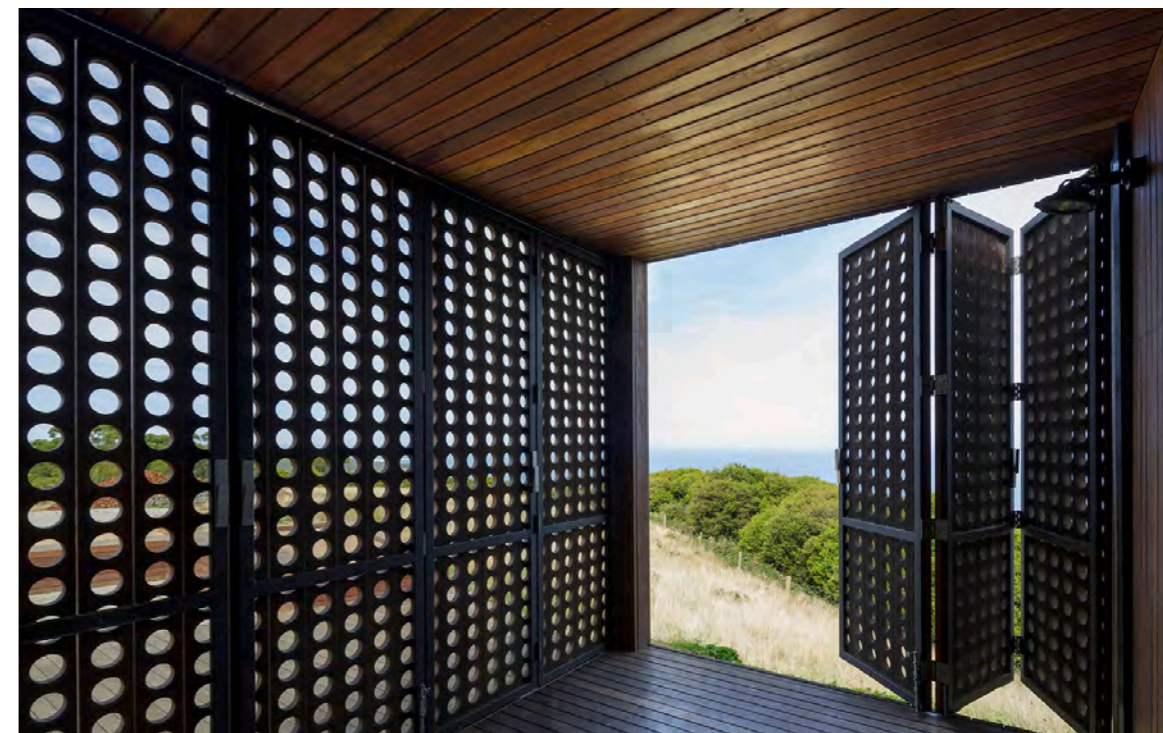


clubhouse
precedents

l g r
a ~ m

clubhouse view





accommodation
precedents

l g r
a ~ m

accommodation view





Legend	
1	cattle farm
2	vineyard
3	3-5 star accommodation
4	clubhouse
5	retreat
6	7-star villa

**Nora Creina
site overview**



revision
-, Issued for Review

date
01-October-2015

scale
NTS

client
J & D Scanlon

project name
Nora Creina
Golf Resort

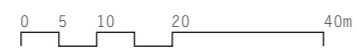
drawing
Nora Creina
site plan





Legend	
①	car park
②	clubhouse
③	road
④	path
⑤	18th green
⑥	practice

**Nora Creina
clubhouse**



revision
-, Issued for Review

date
01-October-2015

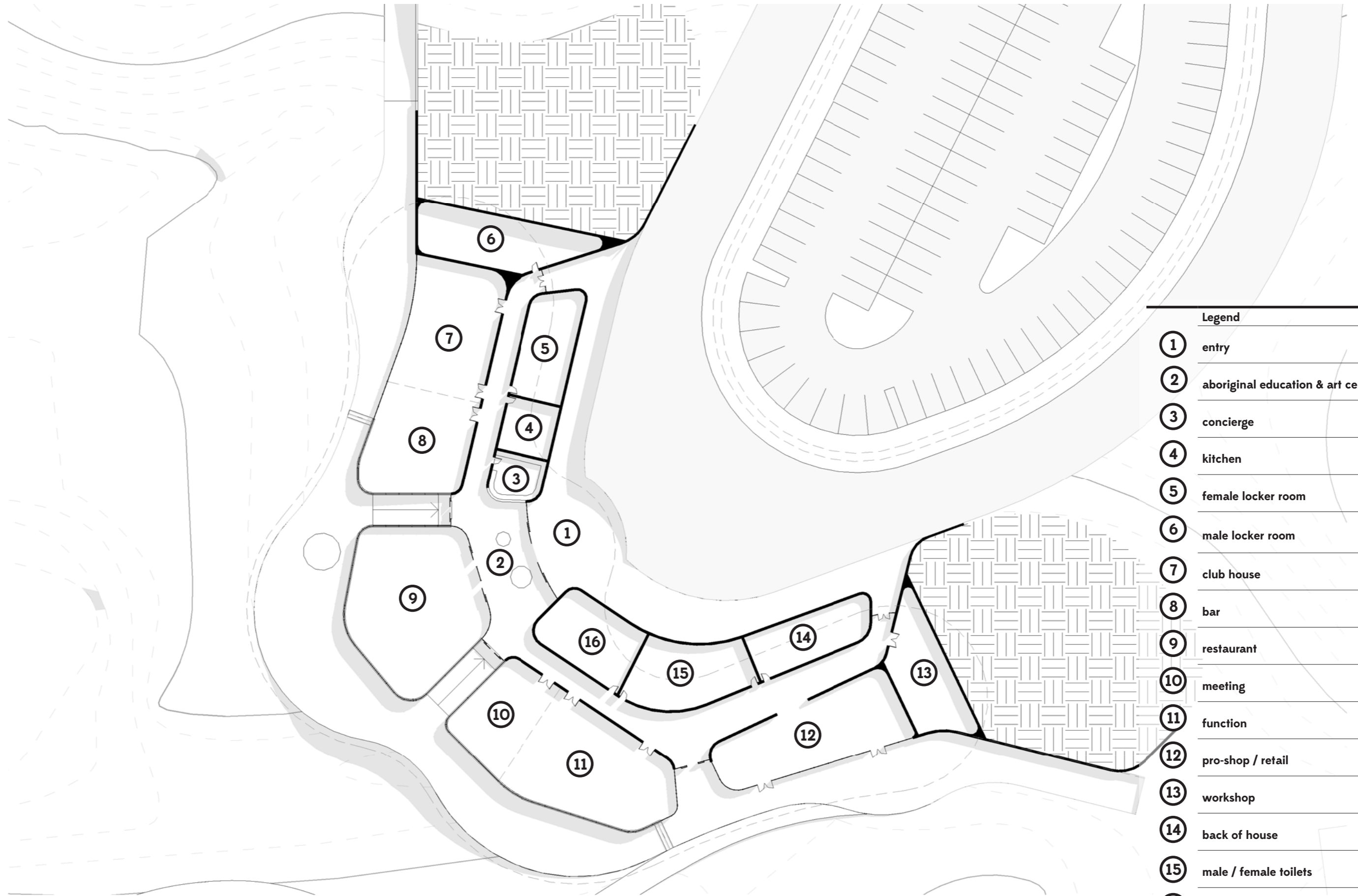
scale
1:1000@a3

client
J & D Scanlon

project name
Nora Creina
Golf Resort

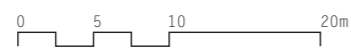
drawing
Clubhouse
site plan





Legend	
①	entry
②	aboriginal education & art centre
③	concierge
④	kitchen
⑤	female locker room
⑥	male locker room
⑦	club house
⑧	bar
⑨	restaurant
⑩	meeting
⑪	function
⑫	pro-shop / retail
⑬	workshop
⑭	back of house
⑮	male / female toilets
⑯	administration

**Nora Creina
clubhouse**



revision
-, Issued for Review

date
01-October-2015

scale
1:500@A3

client
J & D Scanlon

project name
Nora Creina
Golf Resort

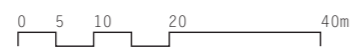
drawing
Clubhouse plan





Legend	
①	clubhouse
②	retreat
③	path
④	10th hole

**Nora Creina
retreat**



revision
-, Issued for Review

date
01-October-2015

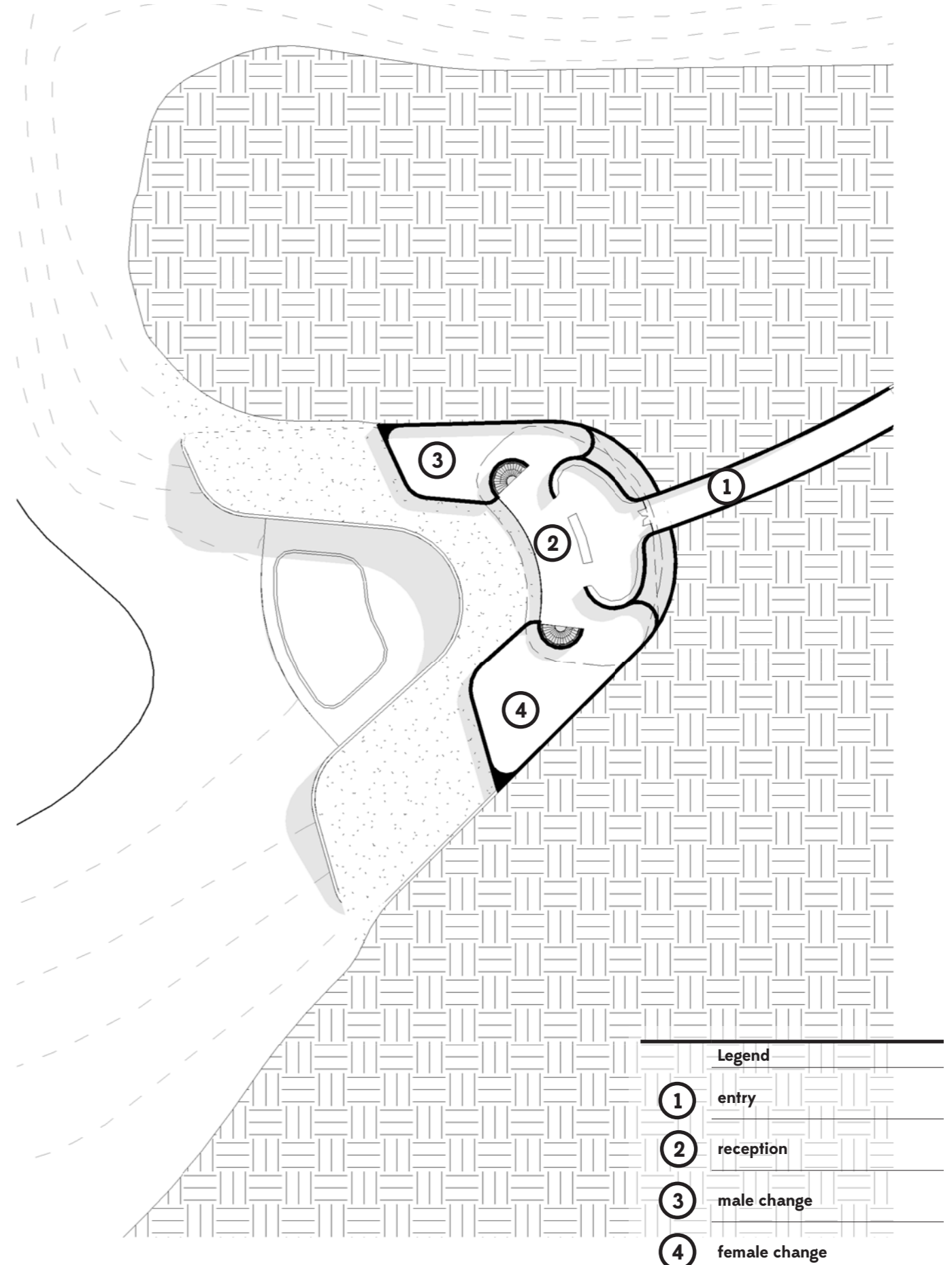
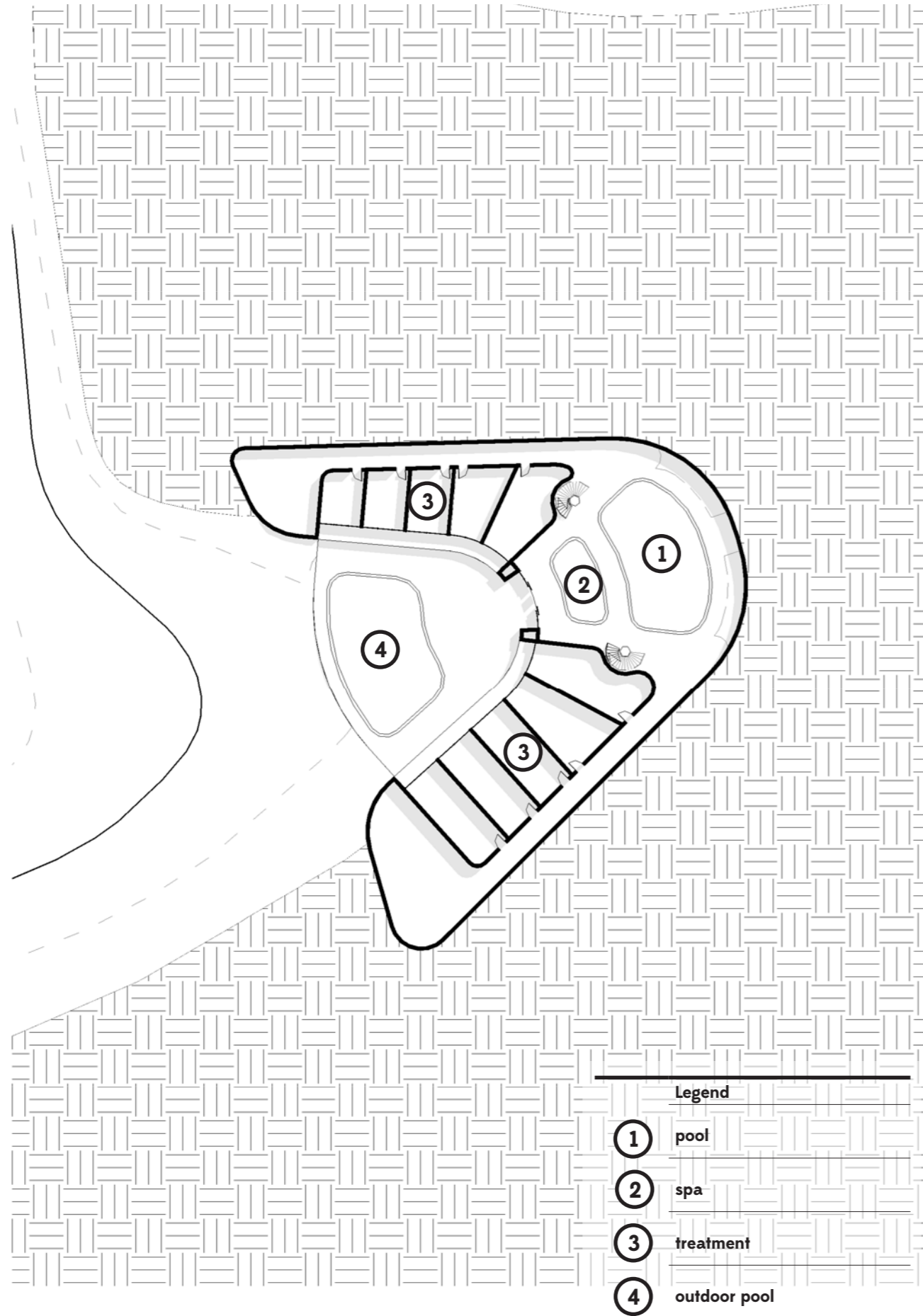
scale
1:1000@a3

client
J & D Scanlon

project name
Nora Creina
Golf Resort

drawing
Retreat
site plan

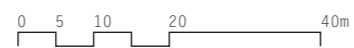






Legend	
①	path
②	accommodation
③	17th hole
④	18th hole

**Nora Creina
accommodation**



revision
-, Issued for Review

date
01-October-2015

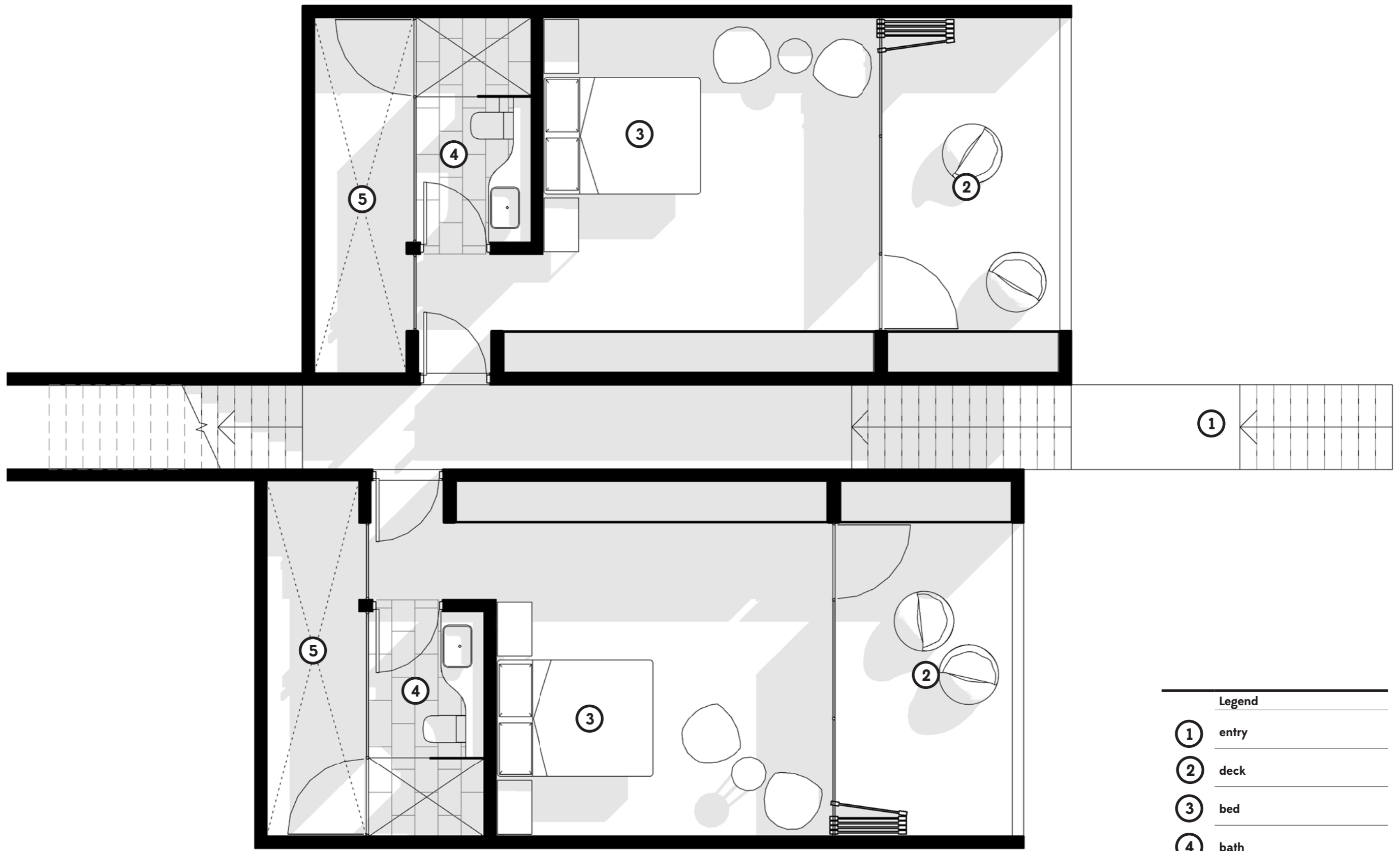
scale
1:1000@a3

client
J & D Scanlon

project name
Nora Creina
Golf Resort

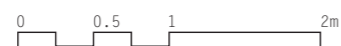
drawing
accommodation
site plan





Legend	
①	entry
②	deck
③	bed
④	bath
⑤	courtyard

**Nora Creina
accommodation**



revision
-, Issued for Review

date
01-October-2015

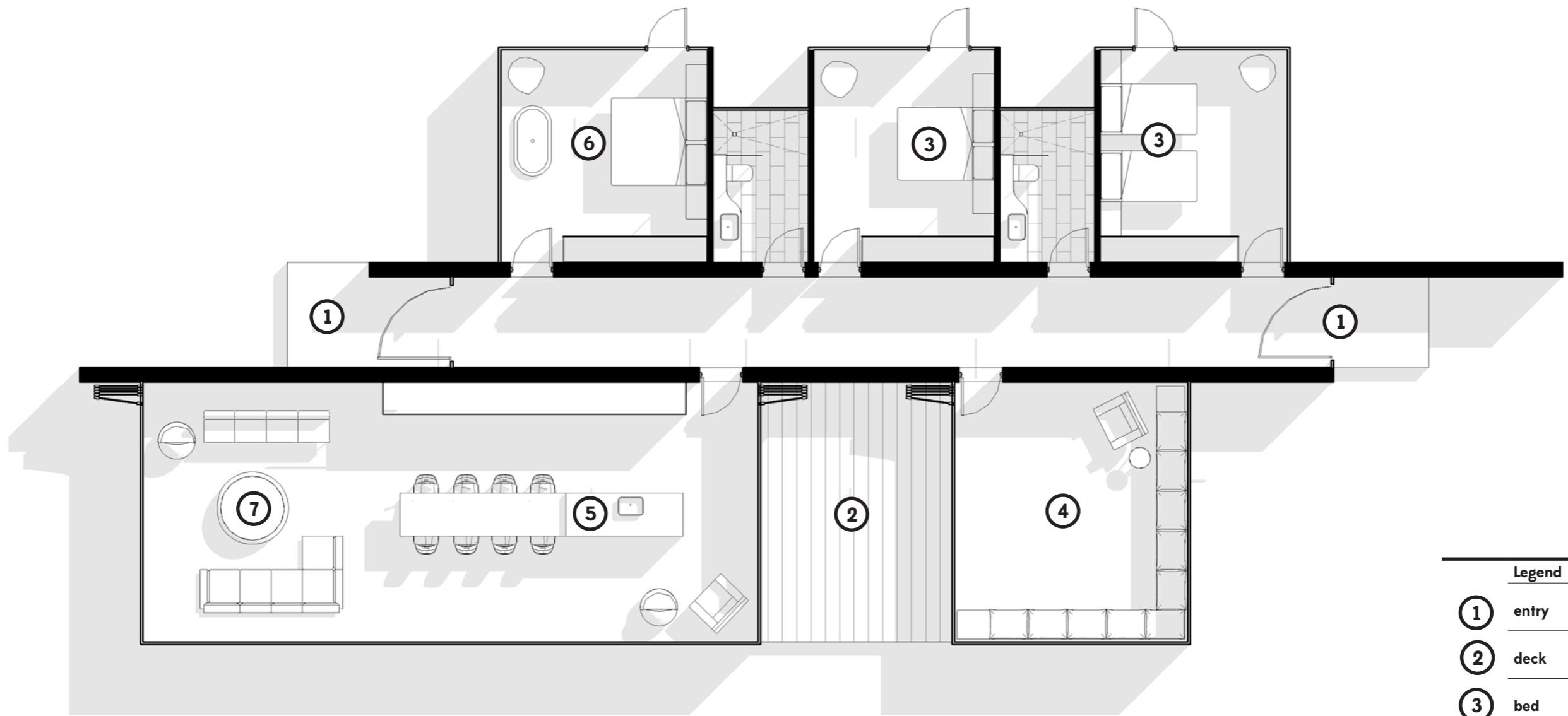
scale
1:50@A3

client
J & D Scanlon

project name
Nora Creina
Golf Resort

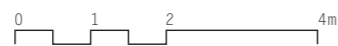
drawing
typical accommodation
plan





Legend	
①	entry
②	deck
③	bed
④	sitting
⑤	kitchen
⑥	master bed
⑦	lounge

Nora Creina
7-star accommodation



revision
-, Issued for Review

date
01-October-2015

scale
1:100@a3

client
J & D Scanlon

project name
Nora Creina
Golf Resort

drawing
7-star accommodation
plan



contact

graham charbonneau

director - m. arch

+61 (08) 8410 1007

+61 (0)406 074 741

graham@studio-gram.com.au



dave bickmore

director - m. arch

+61 (08) 8410 1007

+61 (0)402 586 893

dave@studio-gram.com.au

