

ROTTNEST ISLAND
GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

GENERAL FEATURES										PHYSICAL PROPERTIES ¹										CURRENT PROCESSES					SUITABILITY FOR SPECIFIED LAND USES ²					NOTES				
Map unit ¹	Unconsolidated material ²	Rock ²	Description	Equivalent unit on geological map	Refer ¹ /Slope ⁴	Industrial mineral resources	Shear strength	Compressibility	Permeability	Compaction	Swelling potential	Cohesion as an aggregate	Workability as an aggregate							Foundations	Road fill	Base course	Septic tanks	Sanitary landfill	Excavated material									
QUATERNARY	INDIGENEOUS	S _{1r}	SAND — white, medium-grained, well-sorted, sub-angular quartz and shell debris; locally shelly and lithoclastic	Beach sand (Qh)	0m; F		M-H	L	H	L	N	N	H	SP	Waves, tides	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Modern beach subject to inundation by semidiurnal tides, sediments are highly saline and compacted; very high hazard rating
		S ₁	SAND — white, medium to coarse-grained, moderately well-sorted, quartz and shell debris; locally shelly and lithoclastic	Dune sand (Qh)	0-15m; G	Limesand	H	L	H	L	N	N	H	SP-SW	Waves, wind transport	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Active blowouts and sandheets, unvegetated, severe erosion hazard, subject to both wind and wave erosion, no soil development; very high hazard rating
		S ₂	SAND — as S ₁		5-35m; M	Limesand	H	L	H	L	N	N	H	SP-SW	Waves, wind transport	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	High relief ridges, exposed to winds with steep, poorly cemented slopes, limited vegetation cover and soil development, very susceptible to remobilization where the sparse vegetation is removed; high hazard rating
		S ₃	SAND — as S ₁		5-10m; G	Limesand	H	L	H	L	N	N	H	SP	Waves, wind transport	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Relic foredune and flats topography, high narrow ridges with steep slopes and exposed crests, moderate vegetation cover, poor soil development; high hazard rating
PLEISTOCENE		M ₁	COQUINITE — weakly lithified, mainly bivalves and gastropods in medium to coarse-grained well-rounded calcarenite matrix	Swamp deposits (Qh)	5m; F	Marl	L-M	M	L-M	L-H	L-M	N-H	M	ML	Surface wash, soil moisture changes	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Restricted occurrence, susceptible to flooding, sediments are weakly compacted; very high hazard rating
		M ₂	COQUINITE — weakly lithified, mainly bivalves and gastropods in medium to coarse-grained well-rounded calcarenite matrix	Herschell Limestone (Qh)	0m; F		L-M	M	L-M	L-H	L-M	N-H	M	ML	Foundation, soil moisture changes	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Flats fringing the lakes, within the zone of lake-level fluctuation, sediments are highly saline and uncompacted, salt in the soil profile, very high hazard rating
		LS ₁	LIMESTONE — very pale, yellowish brown, thin calcareous overlying shell beds of CO ₂		1m; F	Shell grit	H	L	H	L	N	N-L	H	GW	Surface wash, soil moisture changes	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Flats and terraces bordering the lakes, high water table, sediments weakly compacted; moderate hazard rating
		LS ₂	LIMESTONE — pale yellowish brown, medium to coarse-grained, sub-angular to well-rounded quartz; trace of feldspar, moderately sorted		1m; F	Construction-grade limestone and shell grit	V	V	H	V	N/A	N/A	M-H	N/A	Surface wash, soil moisture changes	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Flats south of airport, site drainage poor, relatively high water table; moderately low hazard rating
		S _{1r}	SAND — pale yellowish brown, medium to coarse-grained, sub-angular to well-rounded quartz; trace of feldspar, shell debris, variably lithified, surface tankar	Sand derived from Tarnalia Limestone (Qs)	3-15m; G	Specification sand, III	H	L	H	L	N	N	H	SW	Wind transport	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Low relief and gentle slopes, limited soil development, variable vegetation cover, high wind exposure; moderate hazard rating
		LS ₁	LIMESTONE — pale yellowish brown, fine to coarse-grained, sub-angular to well-rounded quartz; trace of feldspar, shell debris, variably lithified, surface tankar	Tarnalia Limestone (Qs) and Rotttnest Limestone (Qs)	0-45m; G-M	Construction-grade limestone	V	V	H	V	N/A	N/A	M	N/A	Solution	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	High relief and steep slopes, limited soil development, calcareous surfaces are common, high wind exposure; high hazard rating

REFERENCES

¹ See lithological classification

² The terms "unconsolidated material" and "rock" are used in the sense of the engineering terms "soil" and "rock"

³ Maximum and minimum elevation of the unit with respect to the Australian Height Datum

⁴ Slopes expressed qualitatively

F — flat <3°

G — gentle 3°–10°

M — moderate 10°–20°

V — variable >20°

The dominant slope of each unit is given

H — high

M — moderate

L — low

N — none

V — variable

N/A — not applicable

⁵ Unified Soil Classification system which describes soils in terms of grain size, grading characteristics and compressibility. Refer to GSNA Record 1989/10 for classification table

⁶ land use undesirable for the environment

⁷ possible problems for the land use

⁸ possible problems for the environment

⁹ land use compatible with the unit

LITHOLOGICAL CLASSIFICATION

UNCONSOLIDATED MATERIAL

A single capital letter denotes the main lithology of the unit followed, if required, by lower case letters denoting qualifying lithologies in decreasing order of importance — left to right.

M — silt S — sand

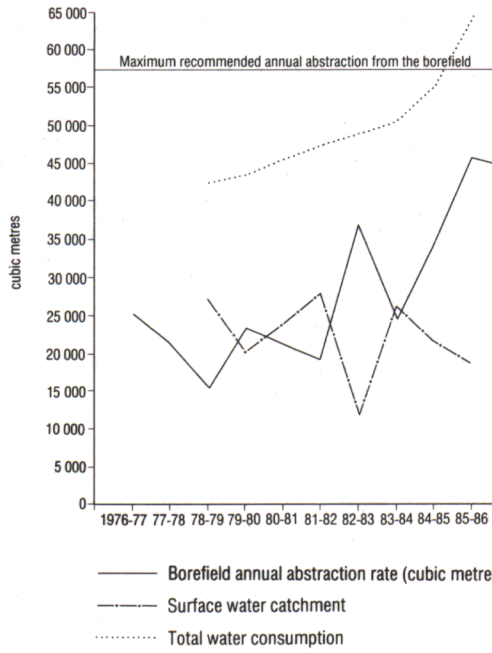
ROCK

Double capital letters denote lithological symbols of rocks.

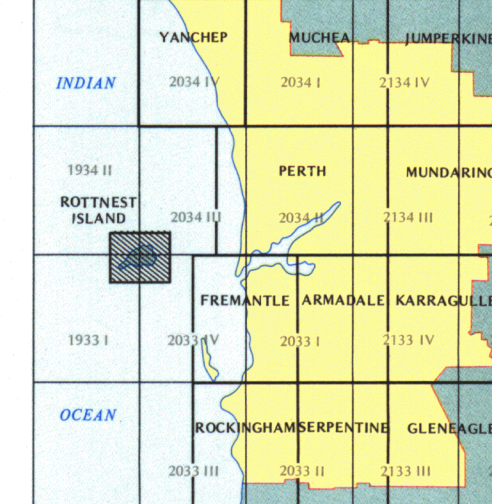
CO — coquina LS — limestone

Different mappable units of similar lithologies are shown by the lithological symbol followed by an Arabic number.

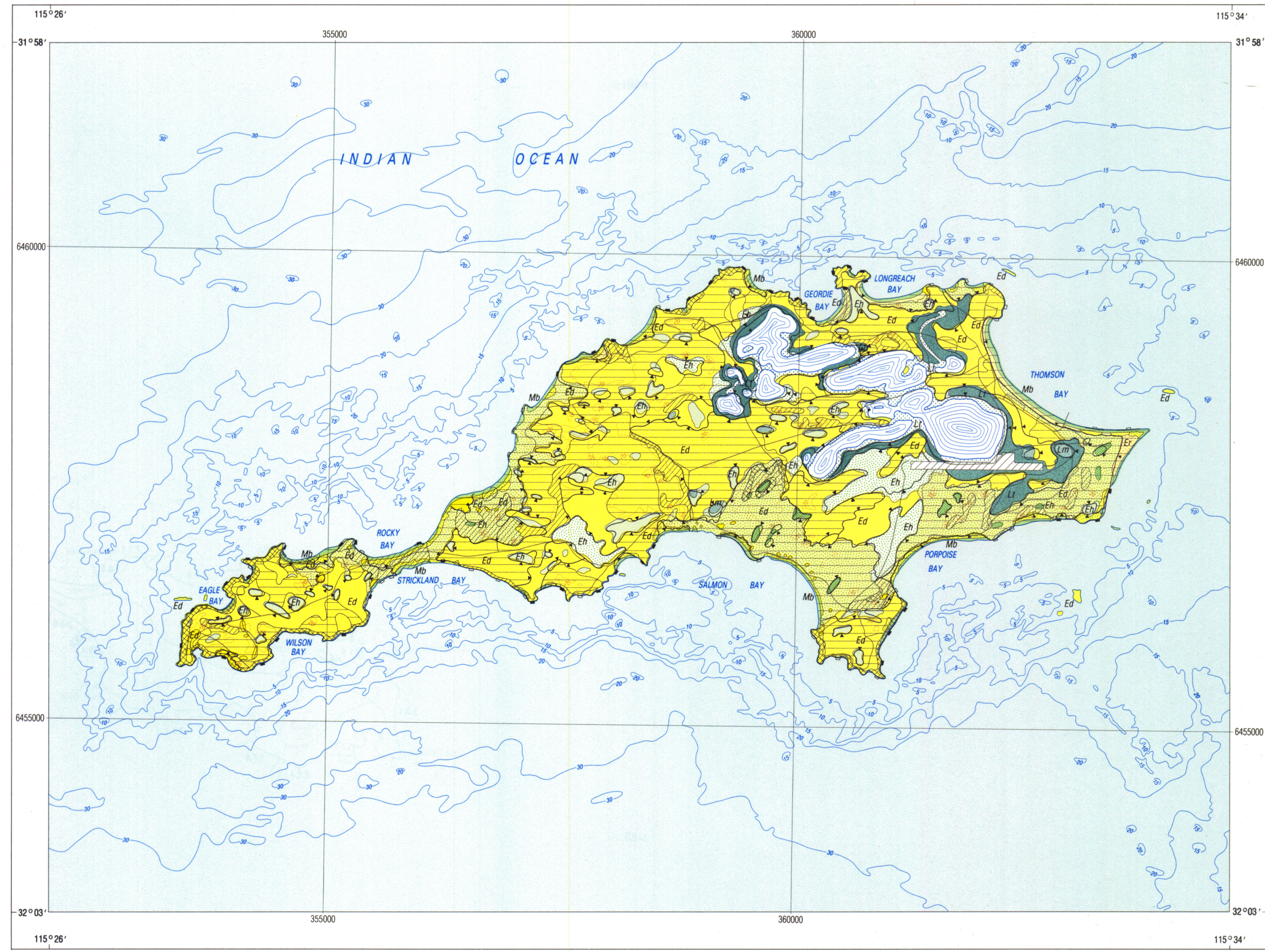
ANNUAL WATER CONSUMPTION



INDEX TO SHEETS WITHIN THIS SERIES



The Australian Map Grid covers Australia and the Territories administered by Australia. Zones are 6° wide plus 1° overlap. A.M.G. zones are numbered from zone 47 with central meridian 99°E to zone 58 with central meridian 155°E. The origin of each zone is the intersection of the central meridian with the equator. On this map, ticks on the sheet edge represent 100 metre intervals on the Australian Map Grid, Zone 50.



GEOMORPHOLOGICAL CLASSIFICATION										SLOPES										FEATURES									
Quindup Dune System (Holocene)										Herschell Lake System (Holocene)										Spearwood Dune System (Early Pleistocene to Early Holocene)									
Mb	beach	Lm	marsh and swamp																										
Ed	active, partially unstable foredune	L	lake marginal flats																										
Ed	relatively stable foredune	L	lake terrace																										
Ed	active blowouts and sandheets	Ed	parabolic and undulating dunes																										
Ed	parabolic dunes	Eh	interdunal swales																										
Eh	interdunal swales	Eh	hind dune flats																										
Er	relic foredune sequence		made ground																										
	lake																												

The geomorphological classification comprises a single capital letter which denotes the origin of the material and a lower case letter which represents the morphology.

ORIGIN

LANDFORM

E — eolian b — beach m — marsh

L — lacustrine d — dune r — ridge

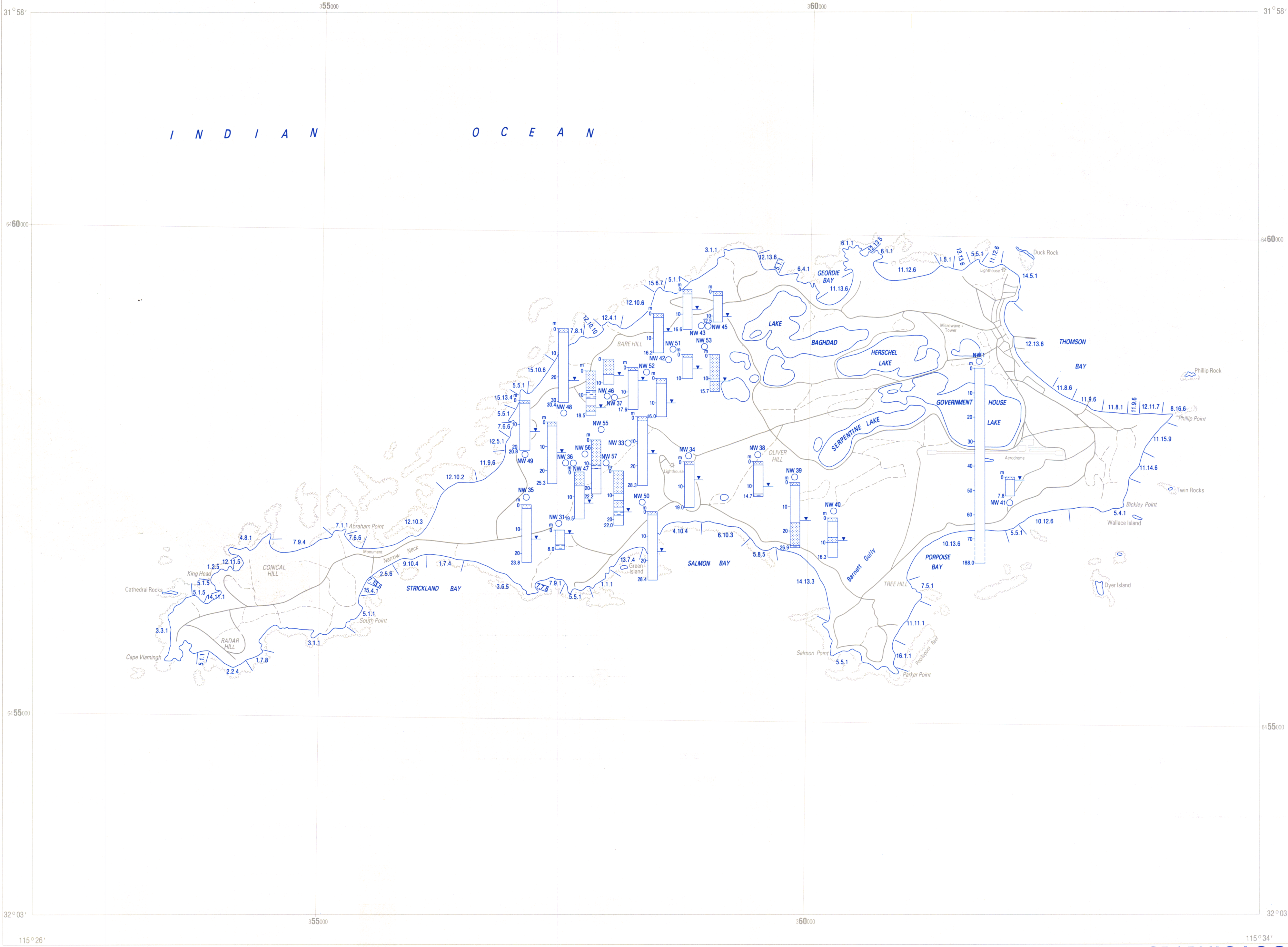
M — marine h — hollow f — terrace

e.g. Ed — eolian dune

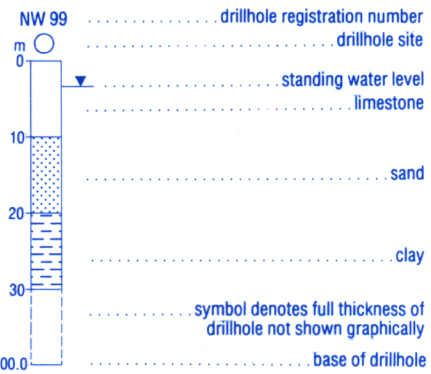
ROTTNEST ISLAND
GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

ENVIRONMENTAL GEOLOGY SERIES
115°26'

PART SHEETS 1933 I, 1934 II, 2033 IV AND 2034 III



REFERENCE



COASTAL LANDFORMS

Each mapping unit is identified by a set of three numbers representing in turn, nearshore, foreshore and backshore landforms

NEARSHORE

- | | |
|---|---|
| 1. Extensive shoreline platform | 8. Long narrow ridge |
| 2. Extensive shoreline platform with occasional elliptical rock holes | 9. Sand |
| 3. Extensive shoreline platform with "paddy field" terraces | 10. Seagrass |
| 4. Extensive shoreline platform with occasional stacks and islets | 11. Seagrass and sand |
| 5. Narrow shoreline platform | 12. Seagrass, sand and shoreline platform |
| 6. Narrow shoreline platform with islets, seagrass and sand | 13. Seagrass, sand and islets |
| 7. Seagrass with shoreline platform | 14. Sand, shoreline platform and islets |
| | 15. Seagrass, sand, shoreline platform and islets |
| | 16. Seagrass and coral reef |

FORESHORE

- | | |
|--|---|
| 1. High limestone cliff | 10. Wide reflective beach backed by partially stable foredune |
| 2. High limestone cliff, scree at base | 11. Narrow reflective beach backed by high limestone cliff |
| 3. High limestone cliff, scree at base, headlands enclose narrow pocket beaches | 12. Narrow reflective beach backed by stable foredune |
| 4. High limestone cliff, headlands enclose pocket beaches as a veneer over a bench | 13. Narrow reflective beach backed by partially stable foredune |
| 5. Low limestone cliff | 14. Narrow reflective beach backed by low accreting foredune |
| 6. Low limestone cliff, headlands enclose narrow pocket beaches | 15. Narrow or non-existent beach backed by scarped foredune |
| 7. Indurated limestone bench higher than intertidal platform, veneer of sand | 16. Actively accreting spit backed by stable foredune |
| 8. Indurated limestone bench backed by low limestone cliff | |
| 9. Wide reflective beach backed by stable foredune | |

BACKSHORE

1. Spearwood Dune limestone
2. Quindakup Dune mobile sand sheet
3. Scarped and unstable Quindakup Dune sand
4. Partially stable Quindakup Dune sand
5. Veneer of unstable Quindakup Dune sand over Spearwood Dune limestone
6. Stable Quindakup Dune sand
7. Stable Quindakup Dune sand over Spearwood Dune limestone
8. Stable Quindakup Dune climbing dunes on relatively steep limestone cliff
9. Small relict foredune plain
10. Small relict foredune plain backed by high limestone cliff

COASTAL LANDFORMS AND GRAPHIC LOGS OF SELECTED DRILLHOLES