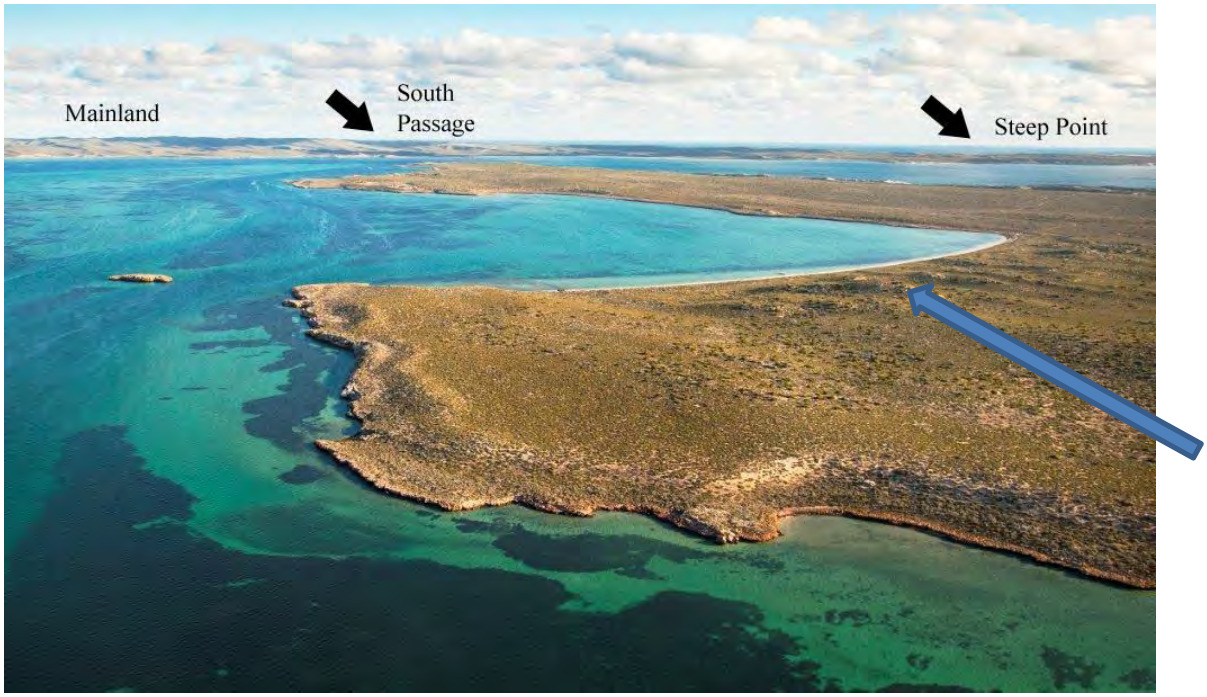
2014

ENVIRONMENTAL REPORT
Sunday Island Bay Lot 304

Hypermarket Pty Ltd 2014

Google view showing development Lot 304 at Sunday Island Bay and Steep Point and South Passage



Aerial view of Sunday Island Bay showing Steep Point, the mainland and South Passage with 28 acre Lot 304 arrowed

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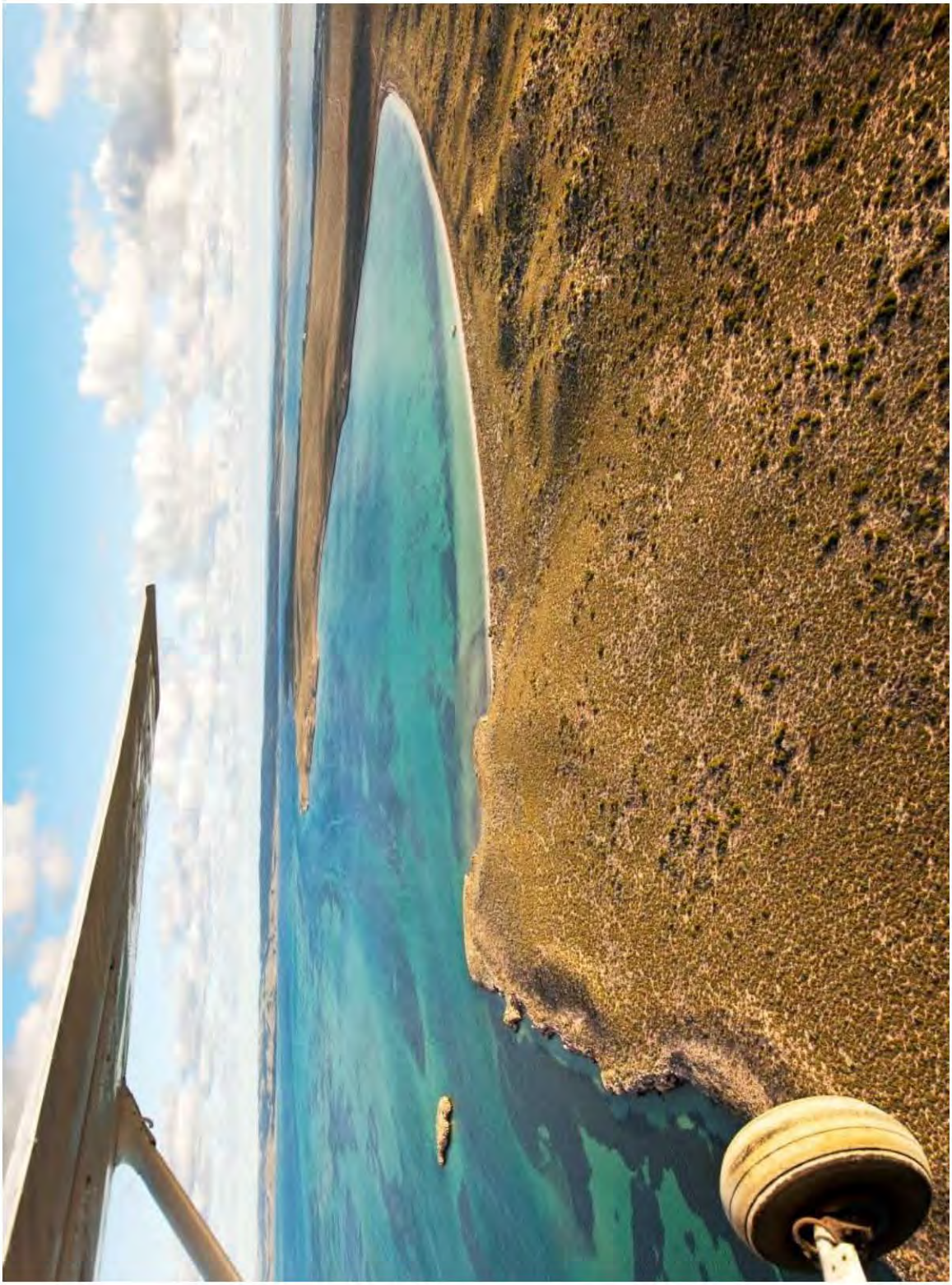
APPENDIX 1

DIAGRAMS, PHOTOS, MAPS



Aerial view Sunday Island Bay and Lot 304 Location

Map 1; Contour Map Lot 304 Sunday Island Bay also showing access easement road within the National Park

View along the front boundary of Lot 304 looking east showing typical vegetation of higher ground

Panoramic view of Lot 304 Sunday Island bay from rear boundary looking south east showing typical coastal Edel Land Vegetation

SECTION I

A INTRODUCTION

Dirk Hartog Island is the largest Island off the West Coast of Australia. Sunday Island Bay is located on the south east coast of the island

This report has been prepared by Hypermarket Pty Ltd,(the owner of Lot 304 Sunday Island Bay), in response to a Shire of Shark Bay requirement to provide an environmental report in regard to a proposal for development and subdivision of this Lot to establish leisure accommodation facilities and associated infrastructure and other services within the freehold property.

The document outlines the proposal for the development of an eco tourist and leisure destination and addresses the environmental factors considered and reviewed in proceeding to development of the 28 acre freehold site.

The report includes separate:

- Statement of Environmental Effects (p30)
- Environmental Impact Statement (p47)

B DESCRIPTION OF DEVELOPMENT PROPOSAL

Lot 304 is an 11.295ha(28 acre) freehold lot located on Dirk Hartog Island on the edge of the Shark Bay Marine Park and the Dirk Hartog Island National Park; it is within the Shark Bay World Heritage Property.

The Dirk Hartog Island National Park and the Shark Bay Marine Park are administered by the Western Australian Department of Parks and Wildlife (DPaW) who as part of an ecological restoration program for the island propose to reintroduce endangered fauna to this location.

The proposed eco- tourism leisure development is to provide a new luxury eco leisure destination for international, interstate and local visitors to visit and launch their exploration and enjoyment of the Shark Bay region from within the Shark Bay World Heritage Property.

The initial development will include seven leisure accommodation units and supporting infrastructure on lot 304 located at Sunday Island Bay.

It is proposed that the unit development will be staged.

It is proposed that each accommodation unit and its associated infrastructure will operate independently for the provision of power, water and sewage under the care and direction of a project manager who will coordinate all operations on site.

Power for each site will be a combination of

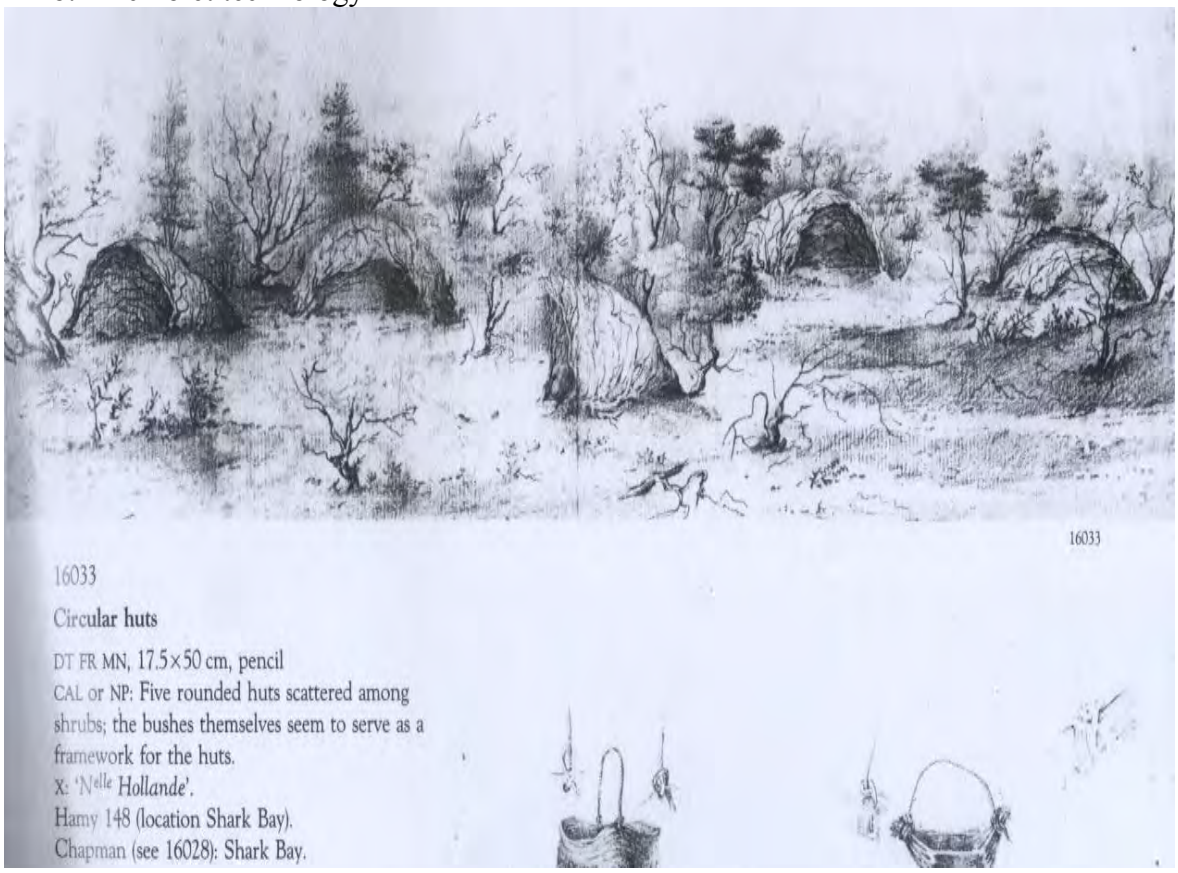
a. Solar
b. Wind
c. Generator

Water for each site will be a combination of

a. Rainwater,
b. Desalinated Ocean Water
c. Ground Water pumped from either West Wells or Two Wells.

Sewage at each site will be treated via

a. System approved by the Shire of Shark Bay and/or
b. Incinolet technology



Sketch from Baudin expedition 1800-04 showing native huts blending seamlessly with the environment in Shark Bay

The architectural brief outlines the necessity to take full account of the existing landscape to ensure that the physical presence of the development impinges in the least possible way upon the site landscape and its surroundings similar to the Baudin drawings above where the huts fit seamlessly into the landscape

Indicative design sketches indicating possible design

Possible variations to the size of each accommodation unit

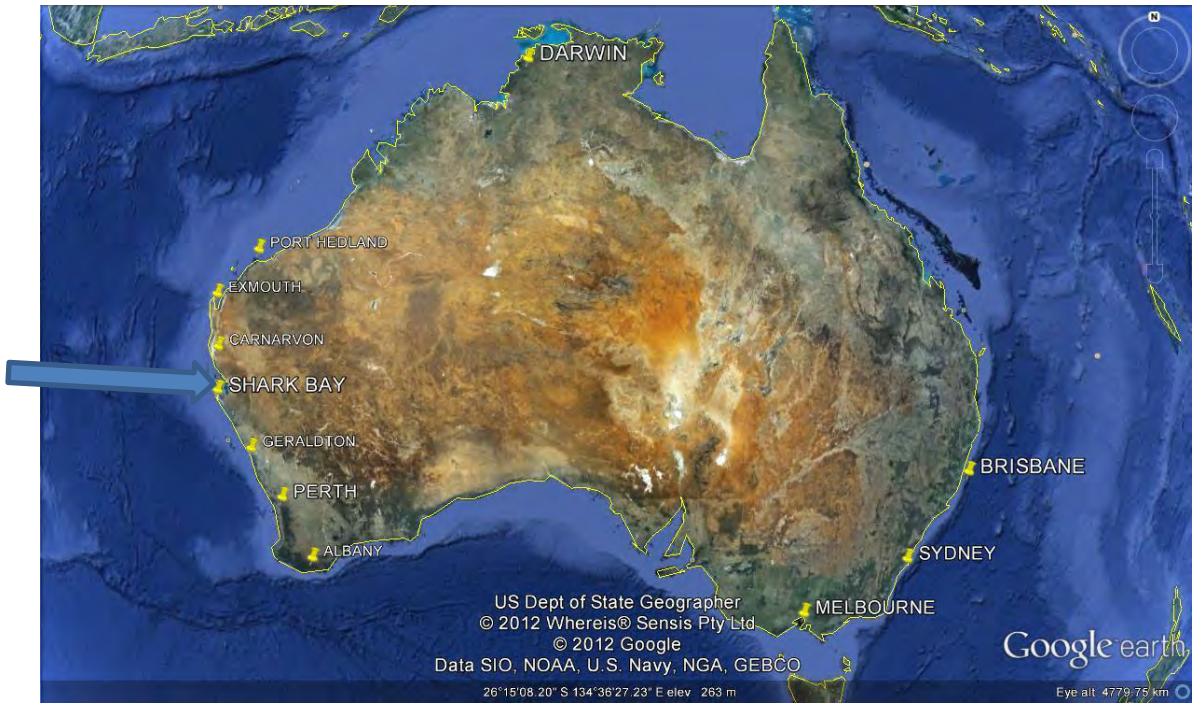
It is proposed that:

1 Colours of all buildings will be as approved by the Shark Bay World Heritage Consultative Committee.

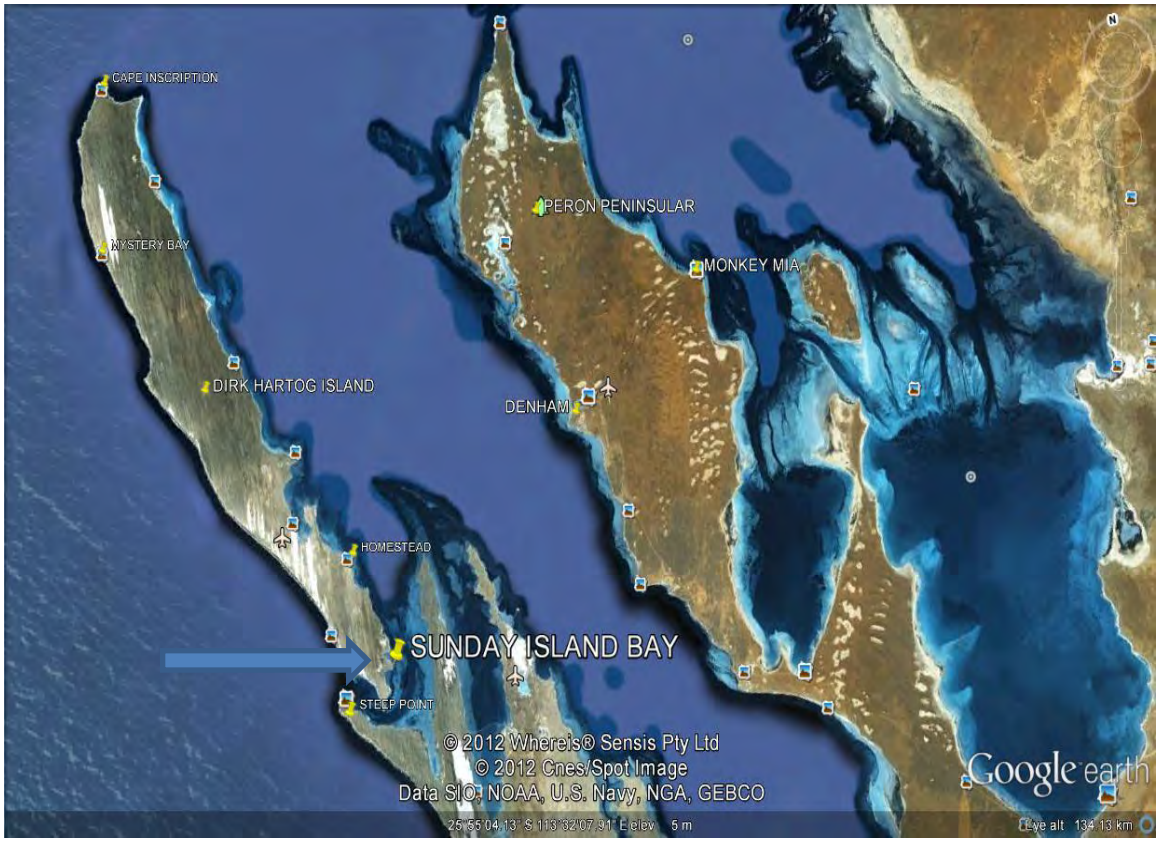
2 Building materials in general will be manufactured to kit level and transported in knock down form for easy assembly.

3 Each accommodation unit will cater for multiple guests and are designed to meet the requirements of disabled guests .

6 Final detailed design will be completed following further consultations.



Google map showing location of Shark Bay relative to Australia and Western Australia



Regional location of Dirk Hartog Island, Sunday Island Bay and the closest town of Denham

C REGIONAL SETTING

Dirk Hartog Island is located on the Edel and Shark Bay 1:250,000 map sheets. The nearest point of the island lies approx 19 miles in a westerly direction from Denham across Denham Sound. The island is almost 80kms long by approx. 10kms wide(at the widest point) and lies at the western side of Shark Bay with its long axis in a south east to north west direction.

Dirk Hartog Island is the largest island off the west coast of Australia and is the site of the first recorded landing of a European on Australian soil in October 1616.

It is located within the Shark Bay World Heritage Property adjacent to the Shark Bay Marine Park and has been declared a National Park(Dirk Hartog Island National Park): The National Park is administered by the Department of Parks and Wildlife(DPaW).

DPaW propose to create an iconic National Park on the island and to reintroduce endangered species and return the island to as close to its original condition as it is possible to achieve with an ecological restoration.

Sunday Island Bay is located towards the south east of the island some 5 kms from Cape Ransonnett the most southerly point on the east coast of the island : this is approximately 5kms from Steep Point the most Westerly point of Australia.

The site is comprised of Lot 304 on Deposited Plan 50257 Sunday Island Bay. The 11.295ha(28 acre) site is one of four freehold locations on Dirk Hartog Island. There are two freehold lots located at Sunday Island Bay and two freehold lots located at Homestead Bay

D THE SITE

Dirk Hartog Island has an area of almost 61,000ha which is represented by five land systems with three of these land systems making up 99% of the total area.(Map 2 p54)

*	Inscription	Approx 24.3% of total area or 14,823 ha
*	Birrida	Approx 0.7% of total area or 427ha
*	Littoral	Approx 0.6% of total area or 366ha
*	Coast	Approx 41.9% of total area or 25,559 ha
*	Edel	Approx 32.5% of total area or 19,825ha

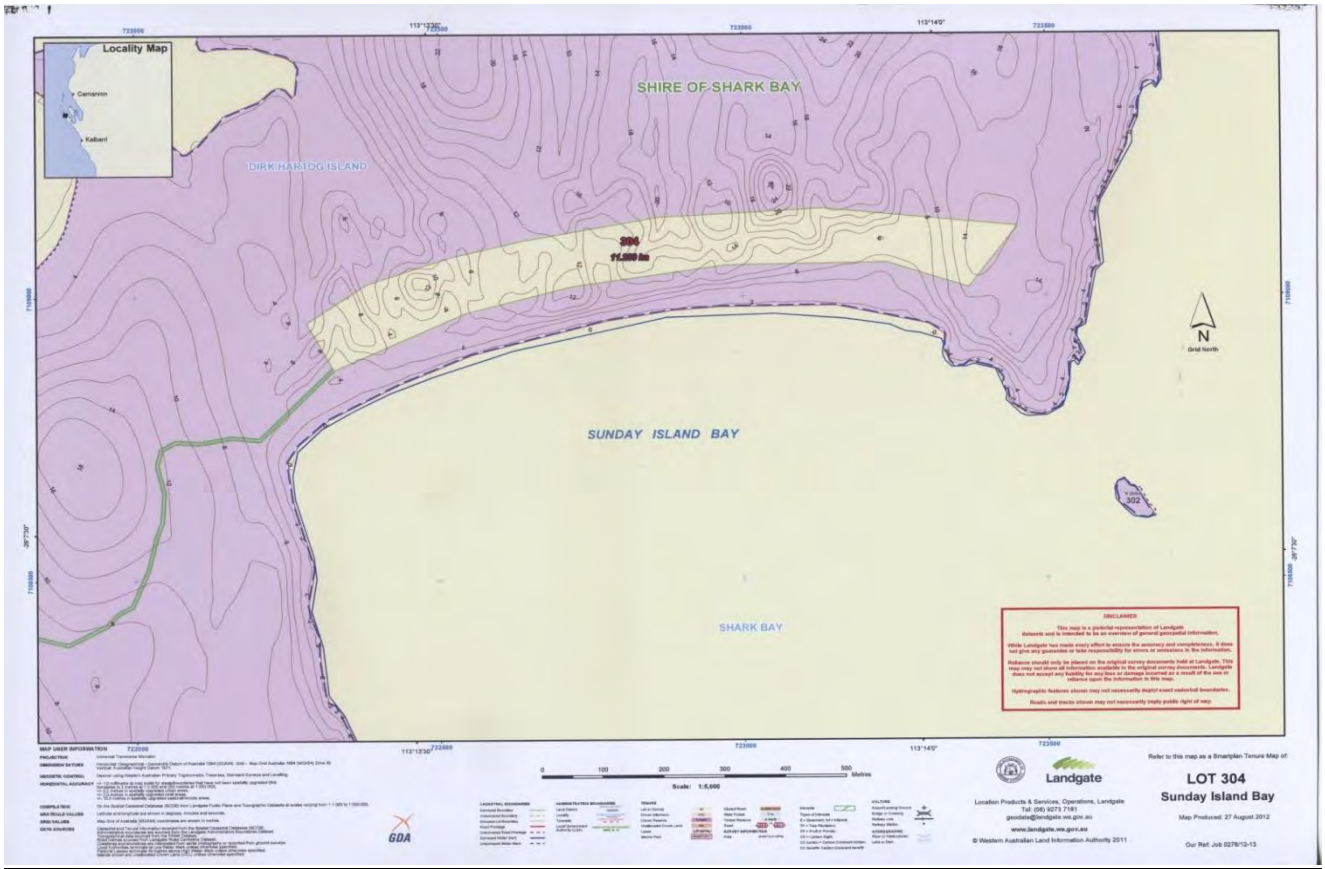
The site – Lot 304 at Sunday Island Bay is included within the Edel Land system and consists of

- land area of 11.295ha or
- .05699% of the total Edel land system and
- .000185221% of the total of all the land systems on Dirk Hartog Island**.**

As such it is not anticipated that the development of lot 304 would have any significant impact on any of the World Heritage Values of Shark Bay

The Edel Land System covers the coastal dune shrub pasture areas and also the heath pasture areas. The last reports from the WA Agricultural Department(prior to the islands return to the State) describe the Dirk Hartog Island Station condition as mostly good or fair with little erosion in spite of continual stocking during a hundred years of pastoral activity.

- The overall range condition was described as good or fair except in the vicinity of some stock watering points.
- There have been no watering points located within 10 kms of the site at Sunday Island Bay for at least 10 years and only three were ever located within the Edel Land system.
- The earlier pastoral activities have led to the widespread distribution of buffell grass and double gees(*Emex..Australis)* around former stock watering points.(there were no double gees located within the subdivision site and limited signs of buffell grass.)
- All stock of sheep have now been removed and DPaW are continuing with the eradication of feral goats. The removal of sheep and the reduction of feral goats has vastly improved the general range condition of the entire island.



Contour map showing Lot 304 Sunday Island Bay and Access Track

E PROPOSED USE OF SITE

It is proposed that the site be developed in stages to establish a premium internationally recognized recreational leisure and tourism wilderness destination.

The Shark Bay Terrestrial Reserves and Proposed Reserve Additions Draft Management Plan 2007 and the Dirk Hartog Island National Park Interim Management Guidelines for Necessary Operations already identify Lot 304 as "highly modified". In this area there will be high level recreation, education and interpretation and group activities specifically catered for.

F CLIMATE

The site is located midway between the northern and southern climatic regions. It experiences a Mediterranean climate with hot dry summers but only moderately cool winters when it also receives its major rainfall. Being at the bottom edge of the cyclone zone it may also receive cyclonic rain over summer; this however is not consistent.

The average rainfall for Denham, the nearest town to the site, is approx. 200mm per annum with the majority falling during winter.(p60) Cyclonic summer rain can double the rainfall received each year, however significant falls have only occurred infrequently (five times in the last twenty years). These occasional summer storms have not caused any major erosion but directly contribute to the ground water of Dirk Hartog Island.

The predominant wind direction recorded at the site is southwest to westerly in the afternoon and easterly to south easterly in the mornings during the months of April through to October. Over the summer months the predominant winds are south westerly for most of the time as indicated in the attached tables. The site faces due south.*(see attached wind recordings in tables 5 and 6 at p58,59)*

G TOPOGRAPHY

Five land systems occur on Dirk Hartog Island three of which(Coast, Edel and Inscription) collectively make up 99% of the entire islands area. (map2 at p54)

The site at Sunday Island Bay is classified within the Edel Land System which comprises approx. 32.5% of the total island area and occurs in the eastern and south eastern parts of the island. It consists of undulating sandy plains with minor low dunes, limestone rises and some saline flats, low cliffs and tall or low heath.

Lot 304 is undulating with hills and reentrants which allow full protection from the prevailing wind, spectacular views and the opportunity to create a world class wilderness leisure destination. From the southern boundary located at 4m AHD the site rises to between 10 and 20m AHD at various points towards the northern boundary of the lot.

The vegetation of the Edel Land System consists of tall and or low open heath or low shrub land and is atypical to the eastern coastline of the island. Typically the soils of Dirk Hartog Island are sandy. In the proposed development area(Lot 304) the soils are similar but contain a proportion of limestone outcrops particularly to the east of the site.(p55)

H GEOLOGY AND SOILS

Typically of the Edel Land System ,(sand and sand over limestone) the Sunday Island Bay site is sand over limestone and minimal sand over limestone anchored by a stable native vegetation cover typical of the Edel Land System. This provides Sunday Island Bay with a very suitable building base. Based on the depth of the existing wells on the east coast of Dirk Hartog Island the ground water is between 10meters and 25 meters below the proposed building and infrastructure sites.

I WATER

There are no wetlands occurring on the property.

J IMPACT OF DEVELOPMENT ON NATURAL ENVIRONMENT

- The limited accommodation and infrastructure footprint area to be used within the site as outlined on the proposal drawings will minimize direct impact on the site
- The proposed use of raised boardwalks for internal access reduces and controls any areas of frequent trampling from human use.
- The proposed use of raised boardwalks for low impact electric and diesel style vehicles internally for group transfers and servicing, necessarily reduces impacts to the site
- The establishment of landscape guidelines will limit the visual impact of infrastructure on the site and assist in mitigating any impact on the landscape
- The use of individual solar systems for power reduces the necessity for large generator systems and in turn reduces any impact on the natural environment by limiting noise and the frequency of service vehicles delivering fuel and servicing the equipment.
- The design proposes to use existing unformed tracks: this maintains the integrity of the site by not creating new accesses and reduces impact from any random vehicular access on the soils and insitu native flora. Whilst weeds are a potential hazard caused by trampling and compacting soils - which could also cause wind erosion through channeling - it is proposed that an education program for all visitors both before and on arrival outlining the importance of only using designated tracks will be undertaken. Additionally the necessity to be careful at all times with the possibility of transferring weeds etc on clothes and shoes will be emphasized to all visitors in cooperation with DPaW.
- The use of DPaW agreed tracks from the site across the National Park maintains the integrity of the site and reduces the impact on the natural environment

K LIMITATION ON VISITOR NUMBERS

Visitor numbers are directly proportional to the availability of accommodation within the proposed development. With seven units to be developed initially it is anticipated that guest numbers could be up to fifty six when all units were completed and operational if each unit was fully occupied with 8 guests. Staff numbers required to service this number of guests will be provided from the existing homestead operations.

Practically however, from experience gained with existing operations, guest numbers per unit would initially probably be approx. 60% of the occupancy rate and again on experience to hand most guests would come during the February to October period due to the moderated winds and temperature at this time. A reduced staffing number would adequately deal with this number of guests. It is projected that this occupancy rate would rise as the facility became better known.

The accommodation to be provided will be part of a coordinated development aimed specifically at promoting the economic sustainability of the site. Building colours will be matched with the Shark Bay World Heritage Consultative Committee's colour pallet.
Any possible water run off from the structures to be constructed will be trapped and used as part of each accommodation units water supplies

L MANAGEMENT OF VISITOR IMPACT

Management of visitor impact will be the task of the project manager and coordinator of the total site area.
Guidelines on access to and from each site and to and from the National Park(in addition to those already agreed) will be developed by the appointed project manager in cooperation with the Department of Parks and Wildlife following subdivision approval.
The recommendations of the Dirk Hartog Island Management Plan will be adhered to.
The recommendations outlined in the Dirk Hartog Island Strategic Management Plan prepared by Hypermarket will be followed.
The recommendations of the Shark Bay Terrestrial Reserves and Proposed Reserve Additions Draft Management Plan 2007 will be followed

M VEGETATION ASSESSMENT

A Botanical survey conducted in 2009 (*Table 8 and 9, p62,63*)is attached and should be read in conjunction with the Western Australian Department of Agriculture's Rangeland Survey.

There are 266 recorded flora species on Dirk Hartog Island. There are no listed declared rare flora on Dirk Hartog Island

The Main vegetation associations on Dirk Hartog Island are:

- Spinifex hummock grassland with an overstorey of either Accacia.coriacea, Pittosporum phylliraeoides over A. ligulata, or Diplolaena dampieri,

View from rear boundary of Lot 304 looking south east showing typical vegetation on the site

View from front boundary of Lot 304 looking south showing typical vegetation of the foreshore of Sunday Island Bay

- Exocarpus sparteus shrubs over Triodia sp. In other areas Acanthocarpus preissii and Atriplex bunburyana, Chenopods or shrubs over hummock grasses across the majority of the island
- Mixed open Chenopod shrubland of Atriplex sp, Olearia axillaris and Frankenia sp. Adjacent to the Western coastline and slightly inland in more protected sites, T. plurinervata, Triodia sp, Melaleuca huegelii, T. baeckeacea and Atriplex sp.
- On the east coast there are small patches of mixed open heath of Diplolaena dampieri, Myoporum sp. And Conostylis sp.

N PROTECTION OF SPECIAL ATTRIBUTES OF ISLAND

The proponent prepared a Strategic Environmental Management Plan in 1995 which addressed the necessity of careful planning in regard to development on Dirk Hartog Island; this plan was submitted to DPaW(DEC) at that time.

With the subsequent preparation of **The Shark Bay Terrestrial Reserves and Proposed Reserve Additions Draft Management Plan 2007 and recently the Dirk Hartog Island Interim Draft Management Plan** by DPaW all of the concerns in regard to protecting the special attributes of the island included within the proponents Strategic Environmental Management Plan were addressed. This draft management plan was ratified in December 2012 and will be complied with and supported in all practicable ways by the proponent.

Although Dirk Hartog Island does not qualify for wilderness protection under established guidelines…. essentially because of the small areas involved….DPaW has applied a high wilderness rating to the land north east of Sunday Island Bay in its Draft Management Plan. It is this wilderness setting that will set Sunday Island Bay apart from other locations on the island.(map4, p64)

The sympathetic treatment of Lot 304 in line with sustainable development will set the site to be a premium wilderness recreational leisure and tourist location.

O SUMMARY IN REGARD TO THREATS AND RESPONSES TO THREATS

Identified possible threats to the World Heritage Values and integrity of the site at Sunday Island Bay as a true wilderness location are :

1 Increased numbers of visitors

a) Trampling

It is proposed that all visitors will receive both a pre visitation briefing via information brochures and internet information and an onsite induction in regard to not straying from the authorized paths that are created within the development zone and beyond the development zone as agreed with DPaW. It is proposed that vehicular access will be

limited and that all internal access including pedestrian and small vehicle(solar or diesel) will be via raised walkways.
Each accommodation unit will provide an information instruction sheet in regard to access around and beyond the development zones.

b) Uncontrolled access

Pets (except guide dogs) will be prohibited.
Firearms will be prohibited
Poisons will be prohibited
Only guests will be able to access the development zones
Guests will be limited to only accessing the development site via fixed access routes to be provided as either raised boardwalks or individual single person tracks

c) Rubbish

Waste will be dealt with as described in the Waste Management Plan

d) Weeds

Guests will be provided with pre-information sheets and instructed on arrival as to the importance of ensuring that they do not bring any type of weed or seeds from the mainland when visiting the site. Additionally they will be instructed on the necessity of adhering to all tracks when moving over the development site and beyond
Guests will be provided with all facilities to limit the possibility of weeds and seeds entering the site. This will include beach umbrellas, towels and beach towels, bags and baskets for picnicking and all cooking utensils where necessary. All food will be supplied on site.

e) Mitigating Factors

All guests will be advised prior to arrival of what they should and should not bring to the island and this will be checked and reinforced on arrival by direct contact with staff. In particular the aims of a weed free location will be emphasized in verbal instructions, written information and clearly visible signs.

2 Visual pollution

a) Buildings

All buildings will be designed to blend with the landscape as shown in the preliminary concept design plans. The materials will be color controlled as per the pallet provided by the Shark Bay World Heritage Consultative Committee

b) Infrastructure

All infrastructure required on each site will be designed to provide the minimum footprint and blend into the landscape.

c) DPaW continues to be consulted in regard to the establishment of a world class eco leisure accommodation facility.

P KEY VALUES OF DIRK HARTOG ISLAND

The Dirk Hartog Island National Park Interim Management Guidelines for Necessary Operations 2010 identified the following "key values" associated with Dirk Hartog Island

A- ENVIRONMENTAL

- Isolation of fauna habitats on islands and peninsulas resulting in survival of threatened species*(by preventing predatory and competitive species from the site*)
- Coastal scenery – Zuytdorp cliffs(*coastal erosional and weathering processes, coastal vegetation and mechanisms of coastal resistance to erosion)*
- **Endemic Dirk Hartog Island subspecies of the southern emu wren**
- Nesting populations of green and loggerhead turtles, listed by IUCN as endangered and vulnerable.
- Remote and Natural qualities of parts of the island

B- HISTORICAL

- **Dirk Hartog Island is the site of the first known European landfall in Western Australia (1616) and site of first physical evidence of European landing in Australia**
- **Gazettal of the Cape Inscription area of Dirk Hartog Island on the National Heritage List**

C- EDUCATIONAL

- Terrestrial environments and proximity to marine environments that offer varied nature based recreational and tourism opportunities and experiences
- Opportunities for viewing a diverse range of native marine and terrestrial flora and fauna

Further within the same guidelines it states

" in accordance with section 56 of the CALM Act , a national park shall be designed to**"…fulfill so much of the demand for recreation by members of the public as is consistent with the proper maintenance and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest**

The Following information has been prepared in line with the Western Australian **EPA's "Guidance Statement for the assessment of Development Proposals in Shark Bay World Heritage Property No. 49 November 2000"**

Under EPA proposal 2- "THE ISSUE"…. the guidance statement states that……

"While World Heritage listing does not prevent development (S7.7,Anon., 1997), there is obviously an expectation that developments are carefully evaluated from an environmental point of view and only allowed to proceed if they can be implemented in a way which does not compromise the values for which the area was listed"

The subdivision and development proposed complies with the guidelines presented in guidance statement No 49 in that:-

- **No Shark Bay World Heritage Values will be degraded or damaged by the development of Lot 304**

Q SHARK BAY"S WORLD HERITAGE VALUES

1 "OUTSTANDING EXAMPLES REPRESENTING THE MAJOR STAGES OF THE EARTH"S EVOLUTIONARY HISTORY"...

- Stromatolites and microbial mats of Hamelin Pool
- Hamelin Pool and L'haridon Bight
- Holocene fossil shell deposits adjacent to Hamelin Pool and L"haridon Bight

DEVELOPMENT AT SUNDAY ISLAND BAY WILL NOT CAUSE LOSS OR DEGRADATION OF ANY OF THE ABOVE WORLD HERITAGE VALUES AS NONE OF THE REFERRED VALUE ITEMS ARE LOCATED WITHIN OR NEAR THE SITE AT SUNDAY ISLAND BAY

2 "…OUTSTANDING EXAMPLES REPRESENTING SIGNIFICANT ONGOING GEOLOGICAL PROCESSES, BIOLOGICAL EVOLUTION AND MAN'S INTERACTION WITH HIS NATURAL ENVIRONMENT"; distinct from the periods of the earth's development, this focuses upon ongoing processes in the development of communities of plants and animals, landforms and marine areas and fresh water bodies.

MARINE ENVIRONMENT

- Unique hydrological structure, banks and sills-eg Faure Sill, steep salinity gradients, three biotic zones
- Hypersaline environment of Hamelin Pool
- High genetic biodiversity due to steep environmental gradients (e.g. Snapper, venerid clams, bivalves)
- Seagrass meadows, their considerable species diversity and their role in the evolution of the marine environment eg Wooramel Seagrass Bank
- Carbonate deposits and sediments, including *Fragum erugatum* shell deposits
- Northern limit of transition between temperate and tropical marine environments resulting in high species diversity(323 fish species, 218 bivalve species and 80 coral species)

TERRASTRIAL ENVIRONMENT

- Botanical province transition zone, most evident in the southern parts of Nanga and Tamala Stations.
- Floral range limits (229 at their northern limits, 56 at their southern limits, 53 endemic vascular plant species).

- Isolation of fauna on islands and peninsulas – 5 threatened mammals on Bernier and Dorre Islands
- Range limit and fauna species richness (100 species of herpetofauna – 9 endemics, 230 species of birds representing 35% of Australia's total species
- Species evolution illustrated in Rufous Hare Wallaby and Banded Hare Wallaby

NONE OF THE ABOVE WORLD HERITAGE VALUES WILL BE LOST DEGRADED OR DAMAGED BY ANY DEVELOPMENT AT SUNDAY ISLAND BAY WHOSE FOOTPRINT IS SMALL AND LOCATION IS MORE THAN 100 METERS FROM THE HIGH WATER MARK AND AT A MINIMUM AHD HEIGHT OF FOUR METERS.(See Waste Management Plan and Foreshore Management Plan)

3 **"CONTAIN SUPERLATIVE NATURAL PHENOMENA, FORMATIONS OR FEATURES"** for instance, outstanding examples of the most important ecosystems, areas of exceptional natural beauty or exceptional combinations of natural and cultural elements.

- Stromatolites
- Abundance of marine fauna(Dugongs, whales, dolphins, sharks, rays, turtles and fish)
- Hypersaline environment of Hamelin Pool
- Faure Sill, Wooramel seagrass bank
- **Coastal Scenery of Zuytdorp cliffs, Dirk Hartog Island,** Peron Peninsular and Herrisson and Bellefin Prongs

THE DESIGN PROPOSAL FOR SUNDAY ISLAND BAY HAS BEEN AIMED TO MITIGATE AND LIMIT ANY COMPROMISE TO THE COASTAL SCENERY OF DIRK HARTOG ISLAND - IT IS DESIGNED TO BLEND IN SEAMLESSLY WITH THE EXISTING LANDSCAPE . THE DESIGN BRIEF HAS BEEN BASED UPON THE DRAWINGS OF NATIVE HUTS SKETCHED DURING THE BAUDIN EXPEDITION 1800-04 SHOWING A LOW PROFILE AND BLENDING WITH THE LANDSCAPE (*no new roads are proposed to be formed and transport around the site is proposed to be via raised walkways***.)**

- Strongly contrasting colors of the dunes/cliffs, beaches and adjacent sea of Peron Peninsula
- Fragum beaches of L' haridon Bight
- Inundated birridas and lagoons such as Big Lagoon
- Seasonal Wildflower display

NONE OF THE ABOVE WORLD HERITAGE VALUES WILL BE LOST, DEGRADED OR DAMAGED BY ANY DEVELOPMENT AT SUNDAY ISLAND BAY, AS EXCEPT WHERE NOTED ABOVE, NONE OF THE REFERRED VALUE ITEMS ARE LOCATED NEAR OR WITHIN THE PROPOSED DEVELOPMENT AT SUNDAY ISLAND BAY. THE DESIGNS INCLUDED WITHIN THE SUNDAY ISLAND BAY DEVELOPMENT, ITS LOCATION AND MINIMUM FOOTPRINT WILL COMPLEMENT THE LANDSCAPE RATHER THAN IMPINGE UPON THE LANDSCAPE WHEN VIEWED FROM ALL ANGLES INCLUDING THE OCEAN

3 "CONTAIN THE MOST IMPORTANT AND SIGNIFICANT NATURAL HABITATS WHERE THREATENED SPECIES OF ANIMALS OR PLANTS OF OUTSTANDING UNIVERSAL VALUE FROM THE POINT OF VIEW OF SCIENCE AND CONSERVATION STILL SURVIVE"

* 5 out of Australia's 26 species of endangered mammals (Shark Bay Mouse, Banded Hare Wallaby, Rufous Hare Wallaby, Western Barred Bandicoot and Boodie)
* Bernier Island subspecies of Ash Grey Mouse; endemic Arenophryne frog
* 12 threatened reptiles (e.g. Baudin Island Skink and Woma)
* 35 migratory bird species; two threatened species – Thick Billed Grasswren and Mallee Fowl
* **Endemic Dirk Hartog subspecies of the Southern Emu-wren**

THE SOUTHERN EMU WREN HAS NOT BEEN SIGHTED OR OBSERVED IN THE VICINITY OF SUNDAY ISLAND BAY. WORLD HERITAGE VALUES WILL NOT BE LOST, DEGRADED OR DAMAGED BY ANY DEVELOPMENT AT SUNDAY ISLAND BAY WHICH WILL BE BASED UPON BEST ENVIRONMENTAL BUILDING AND OPERATIONAL PRACTICES WITH MINIMUM INVASION UPON THE LANDSCAPE.

* Dugongs (approx.. one eighth of world's population), Humpback Whales, Loggerhead and Green Turtles
* Two threatened flora species(Eucalyptus beardiano and Plectrachne bromoides)

NONE OF THE ABOVE WORLD HERITAGE VALUES WILL BE LOST, DEGRADED OR DAMAGED BY ANY DEVELOPMENT AT SUNDAY ISLAND BAY AS NO SPECIMENS OF THE THREATENED FLORA SPECIES(*species E. beardiano and P.bromoides)* WERE FOUND IN THE AREA OF THE PROPOSED SUBDIVISION AND DEVELOPMENT.
ADDITIONALLY THE LOCATION OF THE SITE MORE THAN ONE HUNDRED METERS FROM THE HIGH WATER MARK AT MINIMUM FOUR METER AHD LEVELS AND WITH A SMALL FOOTPRINT BUILT TO THE BEST ECO STANDARDS CURRENTLY AVAILABLE WILL ENSURE THAT IT DOES NOT IMPACT ON MARINE LIFE IN THE ADJACENT MARINE PARK

REVIEW

It is proposed that this plan and its proposals including risks ,threats and responses will be reviewed annually for the first three years following the completion of the development and bi annually thereafter . This will include ;

a. State of health on the site and
b. State of health at key visited sites including
   (i) Tracks-size, depth and form
   (ii) Vegetation-type, cover and state

R TOURISM IMPACTS AND RESPONSES

Tourism can negatively impact on the landscape and particularly occurs when the level of visitor use is greater than the environments ability to cope with this use within the acceptable limits of change. Uncontrolled conventional tourism can pose threats to natural areas and reduce the amenity of its enjoyment for future generations. It can in fact put pressure on an area and lead to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss, increased pressure on endangered species and vulnerability to accidental fires; it can place a strain on water resources.
The proposal for Sunday Island Bay has been designed to wherever possible mitigate each of the impacts detailed and addressed below.

Tourism may impact in many ways:

1. ***Depletion of natural resources: tourism development can put pressure on natural resources when it increases consumption in areas where resources are already scarce.***
   a. **Water**: *water and in particular fresh water is one of the most critical natural resources. Overuse can result in water shortages and degradation of water supplies as well as generating a greater volume of waste water.*
   In a dry location such as Shark Bay there is a tendency for tourists to consume more water whilst on holiday than when they are in their own homes.
   Water for the operations of short term accommodation at lot 304 Sunday island bay will be provided from a combination of 'rainwater', 'desalinated ocean water' and 'groundwater' from existing wells located some kilometers away from the site.
      - Each accommodation unit will trap its own rainwater via roof gutters and direct it into storage tanks for use within its own unit.
      - Each accommodation unit will store ocean water in storage tanks to be gravity fed and directed to its own solar desalination unit providing fresh drinking water on a continuous basis to the accommodation unit; this will in turn be directed to internal drinking water containers.
      - The salt water storage units will serve two purposes; firstly as water for fire fighting and control and secondly water directed to solar desalination.
      - Although no ground water will be sourced within the site there is an opportunity to pump water to the site via a water easement from shallow wells located at West Wells and also from Two Wells located closer to lot 304
      - A central standard desalination plant will provide top up desalinated water to each accommodation unit when required.
      - Water use protocols will be developed and all accommodation units will be provided with on site information packages and instructions on the necessity for all staff, visitors and contractors to conform with these protocols.
      - There are no wetlands within the area of lot 304 and groundwater is located well below the average AHD levels of the site

2 Local resources: ***tourism can create pressure on local resources including energy, food and short supply raw materials***.

Energy :will be independently supplied at each site via a combination of solar, wind and back up generators: each site will include cross connection to allow mutual power support in the event of malfunction. Hot water will be supplied via heat pump and solar technology providing the double possibility of also supplying limited air conditioning to areas of the accommodation units. Cooking will be based upon liquefied gas

Food :will, in the main, be sourced from Perth and regional areas including Carnarvon and Geraldton (the largest closely located food source areas) on a weekly basis. It is not anticipated to result in any undue pressures on the supply line available from these locations. There is little or no food production in the local town of Denham, apart from fresh fish, scallops, snow crabs, blue manor crabs and prawns and consequently no pressure on supply locally.

Raw materials: including building products will also be sourced from the major supply base of Perth where again no pressure will be placed on this source .

Wherever possible local supplies and suppliers will be sourced and used as part of the supply chain to ensure all local trades and suppliers benefit from the development of accommodation facilities at Sunday Island Bay.

3 **Land degradation:** ***Construction of tourism and recreational facilities may place pressure on land resources including wildlife and scenic landscapes.***

It is proposed to develop Lot 304 using best practice eco principles. Buildings will be raised off the ground limiting the necessity for leveling, landfill and landscape impacts.

Building design has been addressed as to shape and form to ensure that visual appearance has minimal impact on the landscape of the site. As the site rises from its front or southern boundary to its rear or northern boundary each building, with World Heritage Committee approved colour pallets, will be designed to blend into its own landscape as shown in the Baudin expedition of 1800-04 drawings of native huts in the Shark Bay area.

Any tracks developed apart from raised walkways will be constructed to provide the minimum footprint taking full account of the on site environmental landscape and the necessity to limit erosion. Information on the location and rationale of the location of tracks and access ways will be provided to all visitors to educate and encourage conformity in this regard. Open fires will not be permitted within the lot and there will thus be no collection of fuel wood from the site or national park.

The control of access and any required remedial action for the foreshore area between Lot 304 and the beach has been addressed within the Foreshore Management Plan for that area.

4 Pollution

*(i) **Air pollution and noise; air travel and road transport has been linked to unhealthy air emissions and noise problems in pristine areas of tourism activity. Boat travel has been linked to noise pollution.***

Access to lot 304 will be via boat or road transport commencing at lot 62 on Dirk Hartog Island or via air from the island's unsealed airstrip located some 15 kilometers north west from lot 304: and by boat directly to Lot 304.

The volume of air travel anticipated and the distance of the airstrip from the site is not expected to provide either air or noise pollution to the site . The increased use of the island airstrip may cause some increased impacts at that location; however due to its distance from all other activities on the island - its location in an open landscape situation and the strip size that only allows smaller aircraft to land it is not considered as problematic or a major concern in regard to pollution.

It is proposed that on site vehicles allocated to each accommodation unit will be of a size similar to Polaris/Toro style 4WD vehicles with electric or diesel power sources. Larger vehicles for group expeditions on the island will be sourced and provided from lot 62 on request.

The distance of at least one hundred meters from the foreshore to each accommodation unit constructed at no less than four meters AHD and the openness of the bay area ensures that noise pollution from vessels will have a minimal affect on the amenity of the location.

(ii) **Solid waste and littering;** ***areas with high concentrations of tourists, tourist activities and natural attractions can result in waste disposal becoming a serious problem*.**

A waste management plan to control, educate and manage solid waste and littering by staff, contractors, visitors and guests has been established.(see separate Waste Management plan)

(iii) **Sewage:** ***construction of accommodation units and supporting infrastructure can lead to sewage pollution that may damage flora and fauna, adjacent ocean and corals located therein*.**

The Lot and all accommodation units are located at least one hundred meters from the ocean high water mark and a minimum of four meters above the Australian Height Datum. Each building site has an area of almost 3500 square meters.

Due to the extent of the site, its distance from and above high water mark and at no less than 4 meters AHD ,the limited building footprints and visitor numbers that can be accommodated within the lot it is expected that the construction of Shire approved effluant disposal systems will mitigate impact on the site and surroundings areas including the ocean. A recently constructed unit on adjacent land is currently in use with an approved septic sewage system (2013).

(iv) Aesthetic pollution: ***improper integration of structures into the landscape can cause visual pollution.***

The architectural style proposed takes account of all of the natural features of the site and the necessity to limit the footprint and keep clearing and fill to the minimum. The design will blend and integrate with the site and its background and has been modeled upon drawings of native camps illustrated by the Baudin expedition to Australia including Shark Bay during the period 1800-04.

Road access will be limited and no parking areas will be provided beyond the proposed raised access routes to and terminating at each accommodation unit.

(v) Physical impacts: ***unbridled access to areas of the site and the adjacent national park has the potential to impact and degrade the ecosystems of the area.***

Agreement has been reached with DPaW for regulated access to the beachfront and across foreshore from lot 304 which will limit, control and mitigate the impact of any perceived degradation of the site and the adjacent national park. It is proposed that these accesses will be developed as raised boardwalk paths.(DPaW letter August 2013).

Clear and concise signs together with visitor induction and information sheets will assist in identifying access protocols and limiting degradation through uncontrolled access

(vi) Tracks: ***the construction of tracks can cause damage to vegetation and lead to site erosion.***

It is proposed that all access within the site will be via raised boardwalks minimizing any possibility of vegetation damage apart from that during the construction stage. Informed environmental management of the site during the construction stage will ensure that the smallest footprint is maintained and any damage to vegetation restricted.

In the event that additional access via tracks is proposed at a later stage these will be limited in size and directed in ways to minimize vegetation damage and possible erosion created by foot pads created.

(vii) **Construction activities and infrastructure development:** ***the development of accommodation and infrastructure on the site including any extensive paving roads and airports has the potential to lead to land degradation, soil erosion, loss of wildlife habitats and a deterioration of scenery.***

The design brief for accommodation units proposed for lot 304 include minimum footprint, raised floors, trapped waters and no paving - all of which will minimize any impacts perceived. No airport or made roads are proposed for the site and any lawn areas are to be artificial grass with no requirement for watering.

The design brief also includes aesthetic compliance of all buildings with their landscape and site specific scenery values as exhibited in the Baudin sketches where the native huts were part and parcel of the existing native bush.

The limited development proposed including minimum footprint and raised floors will help to mitigate any possible impacts on any wildlife habitats.

(viii) Deforestation and intensified or unsustainable use of land; ***excess development can lead to habitat destruction and or unsustainable use of land.***

No major clearing of land is proposed on lot 304. The limited development represents less than fifteen percent of the total area of the site.
Each accommodation construction site will be assessed in terms of its impact on the site and buildings located to achieve the best environmental outcome.

(ix) **Marina development;** ***No marina is planned although application for moorings in the bay will be submitted***.

Apart from the installation of DPaW approved moorings there is no development proposed within the Bay. There are already existing approved moorings in the bay.

(x) Trampling: ***tourists using the same trail over and over again will result in vegetation being trampled eventually causing damage , loss of biodiversity and other impacts. This damage can become extensive when visitors frequently stray off established trails.***

All internal access is proposed to be via raised walkways to prevent the possible effect of trampling.
DPaW have confirmed their intentions to consider any application for raised access routes from lot 304 over the fore shore to the beach frontage of Sunday Island Bay. The construction of such will limit even further the imp act of trampling.
Guests will be provided with information in regard to movement in and around the site prior to arrival and be inducted on arrival to reinforce the importance of access controls.

(xi) Anchoring and other activities: ***Moorings are to be provided within the Bay for use of guests bringing their own boats or for 'the manager' to moor vessels to be used by guests during their stay.***

Anchoring within the bay apart from directly on the beach foreshore will be discouraged. All visitors will be directed and encouraged to use approved moorings located within the bay for their use. There are already eight approved DPaW moorings in the bay.

(xii) Alteration of ecosystems by tourist activities***: habitat can be degraded by tourism activities.***

Wildlife viewing can bring about stress for the animals and alter their natural behavior when tourists come too close.

Protocols and access limits have been established by DPaW in regard to Turtle watching at Turtle Bay to the north of the island
The project manager will ensure that all protocols for visitor interaction and viewing developed internally and by DPaW are explained **to** visitors prior to any eco wildlife experience proposed
The souveniring of rarer species including shells and plants can also impact on the area. Onsite information and guidance will be provided to visitors in this regard.

(xiii) Introduction of exotic species*; tourists and suppliers can unwittingly bring in species that are not native to the local environment and which could cause destruction of eco systems*.

All visitors will receive information prior to their arrival in regard to bio security matters. Upon arrival they will be inducted and asked to check and ensure that they have not brought seeds or plants on their clothing or within their luggage or vehicles that could affect the Dirk Hartog Island restoration project being managed by DPaW.
Any pests, seeds, plants and animals detected will be incinerated on the site as agreed with DPaW operations on Dirk Hartog Island.

SECTION II

S STATEMENT OF ENVIRONMENTAL EFFECTS - LOT 304 SUNDAY ISLAND BAY

The staged development of leisure accommodation units on the 28 acres of freehold land located at Sunday Island Bay lot 304 is proposed as a minor controlled development presenting minimum impact on the values of the site and the surrounding National Park and World Heritage Property Values.

Land Details

Lot 304 Deposited Plan 50257 Sunday Island Bay Dirk Hartog Island

Denham 6537

1 Description of the Proposal

It is proposed to initially develop seven leisure accommodation units and supporting infrastructure on lot 304 located at Sunday Island Bay.
It is proposed that each accommodation unit will be managed as part of a coordinated leisure accommodation destination.

The Lot will be developed, financed and owned as part of a fully integrated tourist accommodation destination over a staged development period. Each separate accommodation unit may be owned by investors, investor groups, individuals and other interested parties or a combination of these .

The development will be staged over a period of time with stage one including the construction of seven accommodation units.

A project manager will undertake the ongoing management, maintenance and letting of each accommodation unit on behalf of their owners. Each accommodation unit will be part of a coordinated managed eco leisure destination .

Each accommodation unit and its associated infrastructure will operate independently for the provision of power, water and sewage.

Power for each site will be a combination of

d. Solar,
e. Wind
f. Generator

Water for each site will be a combination of

d. Rainwater,
e. Desalinated Ocean Water

f. Ground Water pumped from either West Wells or Two Wells.

Sewage at each site will be treated via

c. System approved by the Shire of Shark Bay
d. Incinolet technology.

Information signage related to waste management and access will be erected at suitable locations within the site, within the accommodation units and infrastructure and at transient points near the National Park.(see waste management plan)
The physical shape of the buildings will be based upon the Baudin expedition drawings of 1800-04 of native huts designed to blend seamlessly into the background of the site.
Colours of all buildings will be as approved by the Shark Bay World Heritage Consultative Committee.
Building materials in general will be manufactured to kit level on the mainland and transported in knock down form for easy assembly.
Each accommodation unit will cater for four to eight guests .
On average only five percent of the total area will have accommodation or infrastructure constructed upon it

2 Description of site and surrounding locality

Dirk Hartog Island is the largest island off the west coast of Australia and is the site of the first recorded landing of a European on Australian soil in October 1616. It is located within the Shark Bay World Heritage Property adjacent to the Shark Bay Marine Park and has been declared a National Park.

Dirk Hartog Island is located on the Edel and Shark Bay 1:250,000 map sheets. The nearest point of the island lies approx 35 kms in a westerly direction from local town Denham across Denham Sound. The island is almost 80kms long and about 10kms wide at its widest point and lies at the western side of Shark Bay with its long axis in a south east to north west direction.

Sunday Island Bay is located towards the south east of the island some 5 kms from Cape Ransonnett the most southerly point on the east coast of the island : this is approximately 5kms from Steep Point the most Westerly point of Australia and located at approx. 113”13”30 longitude and 26”7”30 latitude.

The site is comprised of Lot 304 on Deposited Plan 50257 Sunday Island Bay. The 11.2985ha(28 acre) site is one of four freehold locations on Dirk Hartog Island. There are two freehold lots located at Sunday Island Bay and two freehold lots located at Homestead Bay.

Lot 304 has more than one kilometer of frontage to Sunday Island Bay and is separated from the beachfront by a one hundred meter strip of fore shore and nearshore land which are part of the Dirk Hartog Island National Park and Shark Bay Marine Park.

Originally lot 304 was part of the Dirk Hartog Island Pastoral Lease, granted in the mid 1860's and used continually for more than a hundred years for pastoral sheep grazing. Parts of the lot were occupied by a hermit in the 1990's and the Bay was occupied by a pearling venture for some seven years in the early 2000's

The site rises from minimum AHD heights of 4 meters on the southern boundary to as high as 20 meters AHD towards the northern rear boundary of the site.
It is a strip of near coastal land , roughly parallel to the beach. It lies along two sets of orthogonal dunes with the principal set parallel to the coast and the secondary set at right angles - superficial to the main set but with influence on plant densities

The site is included within the Edel land system which comprises some 32.5% of the total islands area and in general consists of undulating sandy plains with minor low dunes, limestone rises and some saline flats, low sea cliffs and tall and/or low heath.

All of the adjacent land and in fact almost all of Dirk Hartog Island apart from the freehold and the lighthouse location at Cape Inscription are part of the Dirk Hartog Island National Park administered by DPaW for conservation purposes

3 Present and Previous Uses of Lot 304

Lot 304 is presently vacant freehold land zoned 'rural' with a recent submission by the Shire of Shark Bay to change this to "special use" being approved by the State Planning Commission in September 2013.

Prior to it becoming freehold land the site was part of the Dirk Hartog Island pastoral Lease used for the grazing of sheep and the pursuit of pastoral activities.
There have been no potentially contaminating activities undertaken on the property

4 Existing Structures on Lot 304

There are no existing structures on the land

5 Operational and Management Details of Lot 304 Eco Leisure Proposal

It is proposed to develop Lot 304 on a staged basis as a tourism and leisure accommodation facility, providing self catering and fully catered options.
Activities including swimming, snorkeling, walking, star gazing and fishing will be conducted close to the site. Expeditions exploring early history and environmental attractions including bird watching, whale watching and historical trips to Cape Inscription and other locations on the island will originate at the site.

It is proposed that a project manager will:

1. establish agreement to manage and maintain the leisure accommodation units and associated infrastructure on behalf of the owner.
2. let the leisure accommodation units on behalf of the owner

3. administer the location and all of its assets to achieve the highest and best returns whilst maintaining full eco credentials in regard to such administration
4. Operate the destination as the launching site for experiences on and around Dirk Hartog Island and the wider Shark Bay area.

When the initial accommodation and associated infrastructure is completed and the destination is fully operational it is possible that up to fifty six guests could be accommodated on site at any one time.

a) It is anticipated that staff members required to service and operate the destination at this level assuming that each unit and the lodge was fully occupied and operational would be sourced from existing operations at homestead bay.
   - Currently existing facilities are operated seasonally with a shut down period between October and February(this will change in 2015 when operations will be open all year) and it is predicted based on these operations that a sixty percent occupancy or up to thirty three guests with appropriate staff members could be an acceptable average occupancy following the completion of the initial accommodation units and facilities.
   - Currently visitor numbers are also seasonal with current experience disclosing most visitors arriving between February(with 3 week shoulder) and October(with up to 4 week shoulder) when the wind recedes and the temperature is more moderate(8-9 months of operations) and the chillier southern weather encourages West Australians to travel north to warmer regions. There is however a growing demand from European visitors to access the facilities during our off season and their European winter.
   - Each accommodation unit will be available as a self catering venue or fully on site catered destination.
   - The building program will be staged to ensure supply meets demand as it develops. (A central lodge may be considered at a later date depending upon investor and financial commitments.)
   - Vehicles similar to Polaris ranger crew cab units will be the preferred vehicle for guests to experience other locations around the island.
   - Guests will be discouraged from bringing their own vehicle and encouraged to take up the use of ‘accommodation provided’ Polaris vehicles or to hire the larger group transport vehicle option from Lot 62 if they want to travel as a group to accessible destinations
   - The operations on the lot will be available on demand 24 hours per day when guests are present. Initially the operations are proposed to be from February to October at this location.
   - No car parking facilities are to be provided apart from the proposed raised walkways capable of accommodating Polaris type vehicles terminating at each accommodation unit.
   - Guests, staff and stores will arrive at the site either directly via boat from Denham or by vehicle from lot 62.

a. Upon arriving at Sunday Island Bay by boat guests can opt to walk the short distance from the beach over raised boardwalks or to be transported by Polaris style vehicles to their accommodation unit or the central lodge
b. Goods delivered via boat/barge to Sunday Island Bay will be loaded onto Polaris style vehicles and delivered directly to the required accommodation or other infrastructure destination.
c. It is anticipated that deliveries will be undertaken twice per week arriving either via boat/barge or directly from lot 62.
    - Machinery that may be present on each site includes

a. Polaris vehicle
b. Generator
c. Wind turbine
d. Turbo burn incinerator
e. Solar panels
f. Solar pumps
    - Waste will be disposed of as described in the separate waste management plan
    - There are no hazardous materials or processes to be conducted on site

6 Threatened Species, Populations and Ecological Communities and their Habitats

The site has an area of 11.2985ha (28 acres) and is located at the edge of the island National Park which has a total area of some 61,000ha (150,000 acres).
There are no land areas within the site of lot 304 identified as a critical habitat or part of a critical habitat.

There is no practical likelihood that operations on the site are likely to significantly affect threatened species, populations or ecological communities or their habitat.

DPaW propose to eradicate the island of feral cats and goats and then begin a program of re introduction of endangered species that once existed on Dirk Hartog Island.

The proponent of the development fully supports the re introduction proposal by DPaW and will cooperate in all practical ways to support this and ensure the developments on Lot 304 do not impact in any meaningful way on any processes now or in the future in regard to species re introduction.

S1 PLANNING POLICIES

1 State Government Environmental Planning Policies Relevant to Lot 304

1. EPA Guidance Statement for the assessment of Development Proposals in Shark Bay World Heritage Property. No 49 November 2000
2. Shark Bay Terrestrial Reserves and Proposed Reserves Management Plan 2012

3. State Coastal Policy No DC 6.1; Western Australian Planning Commission 1989
4. State Coastal Planning Policy No 2.6; Western Australian Planning Commission 2013
5. Shire of Shark Bay Interim Planning Strategy 2013.

2 Regional Environmental Planning Policies

Shark Bay World Heritage Property
The site falls within the Shark Bay World Heritage Property to which reference is made in this report.

3 Shire of Shark Bay Local Plan

The land is currently zoned 'rural' in line with its previous use as part of the Dirk Hartog Island Pastoral Lease.
The Shire of Shark Bay in reviewing their Town Planning Scheme recommended a change of zoning from 'rural' to 'special use'. This was approved and endorsed by the State Planning Commission in September 2013.

Council has discretion to approve short term accommodation on lot 304 under the present town plan.

S2 ESSENTIAL INFRASTRUCTURE

There is no essential infrastructure on the site and it is proposed that this will be provided individually to each site by the owner of that site.

1. Water will be provided from a combination of
   a. Rainwater captured from accommodation roof's
   b. Desalinated ocean water drawn from the ocean
   c. Ground water transported via easement from existing and operational wells
2. Energy will be supplied via a combination of
   a. Solar power
   b. Wind power
   c. Generator
3. Telecommunications via mobile technology is already present on the site
4. Disposal and management of sewage shall be by either
   a. Septic tank as approved by the Shire of Shark Bay
   b. Incinolet technology
5. Wastewater will be filtered and recycled through an approved greywater system before ultimate disposal on site

1 Temporary Development

Apart from temporary accommodation and facilities during the construction phase all buildings and development will be regarded as permanent although construction will allow for them to be moved.

2 Covenants and Agreements

The land has covenants attached to it to the benefit of the West Australian Minister for Land and.
Covenants to the benefit of the owner of the land for the transport of water from existing wells on Dirk Hartog Island.

4 Building Height

All accommodation and support infrastructure will comply with Shire of Shark Bay Town Plan No3 and its amendments.

5 Pollution

It is not anticipated that there will be any necessity to impose air and noise controls as it is not expected that there will be any air or noise pollution created on the site.

6 Erosion and Sediment Control

The necessity for erosion prevention and sediment control has been mitigated through water capture and storage and properly installed and approved waste systems and access planning. All access tracks are proposed as raised walkways also capable of carrying Polaris styled vehicles referred to earlier.
The foreshore management plan has identified key performance indicators that will be acted upon in the event of degradation caused to the foreshore area between the site and the beach; these kpi's will equally apply to lot 304

7 Flood Prone Land

The land is not prone to flooding

8 Bushfire Considerations

Each accommodation unit will be connected to its own fire water tank which will be located at a position where, if necessary, it can be gravity fed without the requirement for pumps operated by power.
Each accommodation unit will provide fire fighting hoses and pumps with connecting soft hoses to allow connection to the ocean in the event of fire.

9 Trees and Native Vegetation

It is not proposed to undertake any major clearing or leveling of the site. All buildings are proposed to be constructed above ground using the smallest footprint for construction and building activities.
Replanting proposed within the foreshore management plan applies equally to the Lot in the case of degradation caused by wind or other factors. Reference books identifying the species suitable for replanting will be maintained at Lot 62 for reference

10 Acid Sulfate Soils

There are no acid sulphate soils located within the site and it is not proposed to undertake any major excavation work on the site

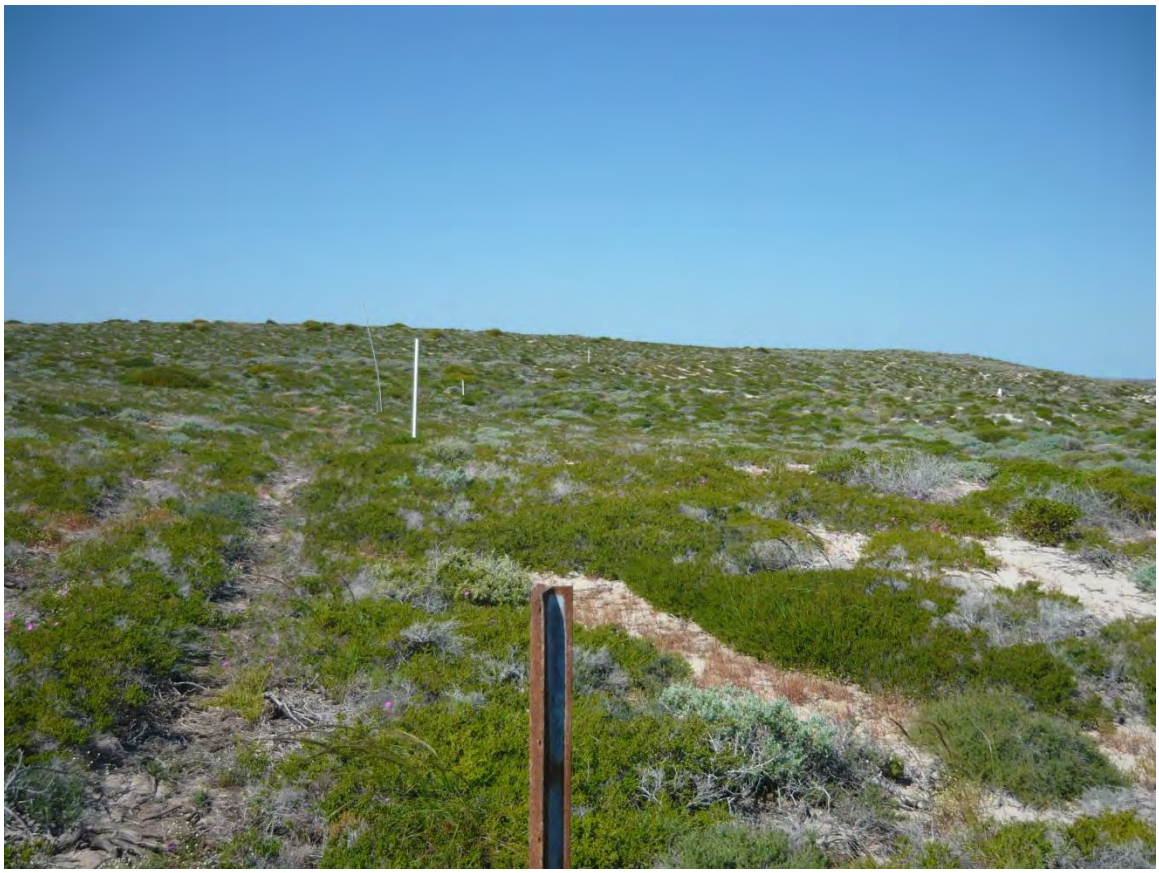
11 Heritage

There are no known heritage locations within the boundaries of the site.

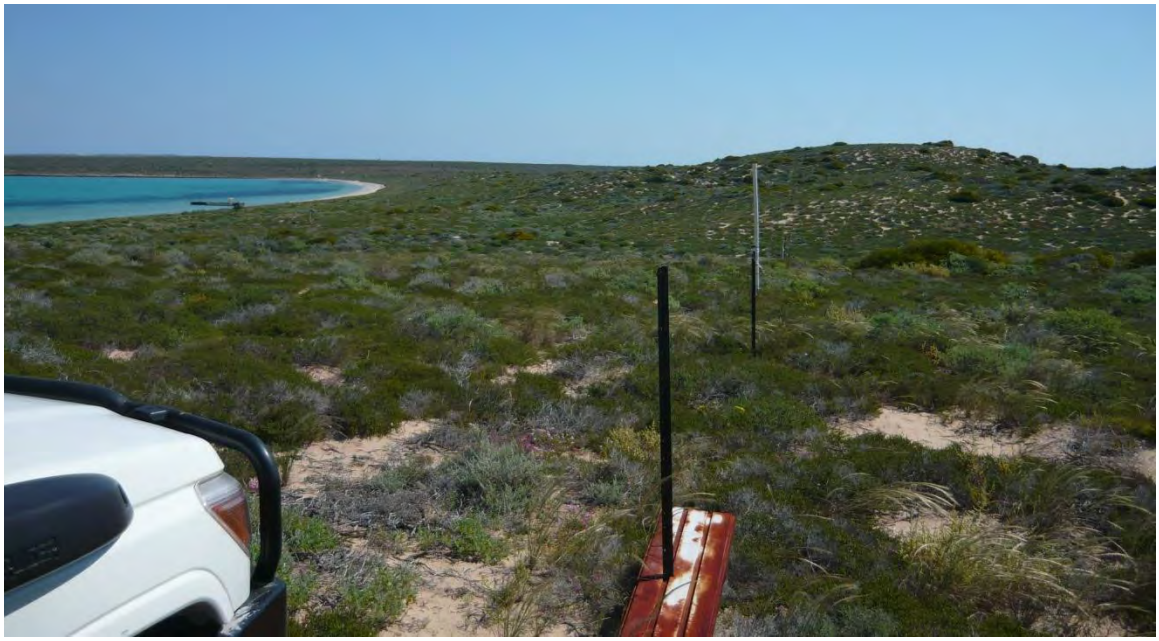
The site has been inspected and cleared of Native Title Claims by aboriginal representatives of the MALGANA. The owner of the site has entered a documented and transferrable agreement with the Malgana People representatives in regard to employment and interpretation materials to be erected on site.

Sunday Island Bay Panoramic View

View From Southern Boundary of Lot 304 Showing Typical Edel Land Vegetation



View From Northern Boundary of Lot 304 Showing Typical Edel Land Vegetation



View From the Rear Boundary of Lot 304 Looking South West Showing Typical Edel Land Vegetation of the Site

View From South East Corner of Lot 304 Showing Typical Edel Land Vegetation

Shagmyer North of Sunday Island Bay

Sunday Island Bay Beach Front

Sunday Island

Sunday Island Bay Beachfront

Sunday Island Bay Recreational

Sunday Island Bay Looking South East to Mainland

Sunday Island Bay Recreational

Sunday Island Bay Recreational

Sunday Island Bay Aerial photo looking North East

Track into Sunday Island Bay

Sunday Island Bay Leisure

Cruising Sunday Island Bay

SECTION III

T ENVIRONMENTAL IMPACT ASSESSMENT

The unique characteristics of Lot 304

1. **Size and nature of the development of Lot 304 Sunday Island Bay**

   The proposal for lot 304 includes the development of seven accommodation units within the Lot.

   The area of the site is 11.2985 ha(28 acres).

   It is proposed that buildings will be manufactured in knock down kit form for easy on site assembly and minimum impact on the physical site.

2. **Location of the proposed development**

   The development is located on Dirk Hartog Island within freehold lot 304 located at Sunday Island Bay.
   Dirk Hartog Island is the largest island on the west coast of Australia and is located within the Shark Bay World Heritage Property , adjacent to the Shark Bay Marine Park(an embayment area larger than Sydney harbor) and has been declared a National Park

3. **The character of the natural environment being impacted**

   The climate of Dirk Hartog Island is semi arid although rainfall records indicate that it receives more rain than the adjacent mainland.
   The landforms include rugged cliffs in the west and stable vegetated sand dunes inland including on lot 304.
   The vegetation ranges from tall open heath to low open heath with hummock grasses, hummock grasslands and some low open shrubland
   The island supports many bird species and a small number of marsupials.
   Lot 304 at Sunday Island Bay is included within the Edel Land System which represents approx. 32% of the islands total land area and is described as consisting of undulating sandy plains with minor low dunes, limestone rises and some low saline flats, low sea cliffs and tall and/or low heath
   Lot 304 is described as a strip of coastal land, roughly parallel to the beach. It lies along two sets of orthogonal dunes with their principal set parallel to the coast and the secondary set at right angles and superficial to the main set but with influence on plant densities.

Environmental Resources and potential impacts of development

LAND RESOURCES

a. Loss of plant species and communities

There are no known endangered plant species located on the site.

The building design included within the architectural brief obligates a design that uses the ;

a. Smallest footprint
b. Raised floors
c. Knock down construction
d. Connecting walkways and small vehicle access

The implementation of the project will include all of the above factors which will limit any loss of plant species during both the construction period and the on going operations of the site.

Full support will be given to DPaW in implementing and managing their biosecurity plan in regard to weed management

Remedial actions included in the foreshore management plan will apply equally to the subdivided lots.

b. Loss of wildlife and wildlife habitat

The building design brief ensures minimum disturbance to the existing land during the construction period and controlled access after completion to limit any alteration to existing habitats and any wildlife present

Full support will be given to DPaW in implementing the reintroduction of species previously present on the island following the eradication of feral goats , cats and other predators

c. Loss of other natural resources

As with both of the previous points in relation to flora and wildlife the architectural brief is specific that any accommodation buildings and infrastructure must not impinge on the landscape value of the site. The building design will blend with the landscape and colour and generally follow the natural form of native huts sketched during the Baudin expedition to Shark Bay in 1800-04.

d. Soil erosion

As it is not proposed to construct any car parks or other similar infrastructure with impervious surfaces the ability to cause soil erosion from storm water will be avoided.

All accommodation and other building infrastructure will be designed to trap rain water for collection , storage and use at each accommodation unit and thus this will also avoid any on site soil erosion

All transport within the site and over the abutting strip of foreshore national park will be via raised walkways again avoiding the possibility of soil erosion through trampling

a. Does the project site involve

i) Changes in relief and drainage patterns

It is not proposed to make any changes to the land contours and levels with in most cases all leveling of buildings undertaken by drilled support pylon variances

ii) A landform or topographic feature of local or regional interest
There are no landform or topographical features of local or regional interest on the site

iii) Floodplain
The site is not part of any floodplain area

iv) An area of soil instability
There is no soil instability at any point where construction activities are proposed

v) An area of bedrock
There are no areas of bedrock on the site although at some sections there is close to surface limestone

vi) An area with the groundwater table within 3 meters of the soil surface
There is no area on the site where the groundwater table is within three meters of the soil surface

vii) Lot coverage of more than 50% by impermeable surfaces
There will be no area exceeding 50% of the site that would be constructed with impermeable surfaces

viii) Prime agricultural land
Although currently zoned rural no area of the site is regarded as prime agricultural land

ix) Wetlands
There are no wetlands on the site or close by

WATER RESOURCES

A Surface and groundwater hydrology

a) Does the proposed project involve

i) Location traversed by a stream
The site is not traversed by a stream

ii) Greater than 10% change in storm water flow
There will be no change in storm water flow following development as all storm water will be trapped and used on site

iii) Use of septic tank soil absorption fields for on site waste disposal
Septic tank soil absorption units will be installed at each accommodation unit complying with Shire of Shark Bay pretreatment requirements. Grey water will be recycled.

iv) Lowering of water table by pumping or drainage
There will be no lowering of the water table at the site by pumping or drainage as no ground water will be sourced from the site

v) Ocean or lake frontage
The site fronts the ocean at Sunday Island Bay but is set back more than one hundred meters from the high water mark and the lowest point on the site is at least four meters above AHD.

B Water quality

The water to be used on site within the development is a combination of rainwater, desalinated ocean water and groundwater pumped from surface well located many kilometers from the site.

C Aquatic species and communities

There are no aquatic species or communities on the site. They are however present in the ocean located some one hundred meters plus from the front boundary of the site

AIR RESOURCES

a. Air

It is not proposed to conduct any obnoxious industry on the site which will ensure there is no air pollution generated within the lot

b. Noise

It is not proposed to conduct any industrial businesses on the site which will ensure there is no onsite noise pollution. The operation of back up generators will provide limited noise which will be contained within baffled containment areas to minimize any such impact.

BIOLOGICAL RESOURCES

Does the project involve;

a. Critical habitat for plants and animals of community interest

There are no known critical habitats for plants or animals located on the site that may be of community interest.

b. Endangered or unusual or rare species of;

i) Land animals

ii) Birds

iii) Plants

There are no known endangered or unusual or rare species of land animals, birds or plants located on the site.

Endangered bird species 'emu fairy wren' is located on Dirk Hartog Island but has not been observed on or near the site

DPaW propose to reintroduce marsupials that were previously located on Dirk Hartog Island at some time in the future when feral cats, goats and other non natural predators have been eliminated or controlled. This program is fully supported by the manager of the proposed development

c. Removal of 25% of present trees

There is no proposal to remove any vegetation or trees from the site

SOLID/ HAZARDOUS WASTE

There are no critical environmental health hazards including exposure to toxic chemical, the risk of fire or explosion or spill or hazardous waste that may occur following completion of the development that have not been addressed through management plans

prepared for the site. The storage of gas for kitchen and generator use will be addressed as per State regulations in this regard.
Fuel for any vehicles will be controlled and stored by the project manager at a separate off site location at lot 62
The project will not process or produce hazardous waste
The project does not involve the transport of solid or hazardous waste
Separate storage tanks located on site will only be used for water storage
The site is not located upon or near any land fill

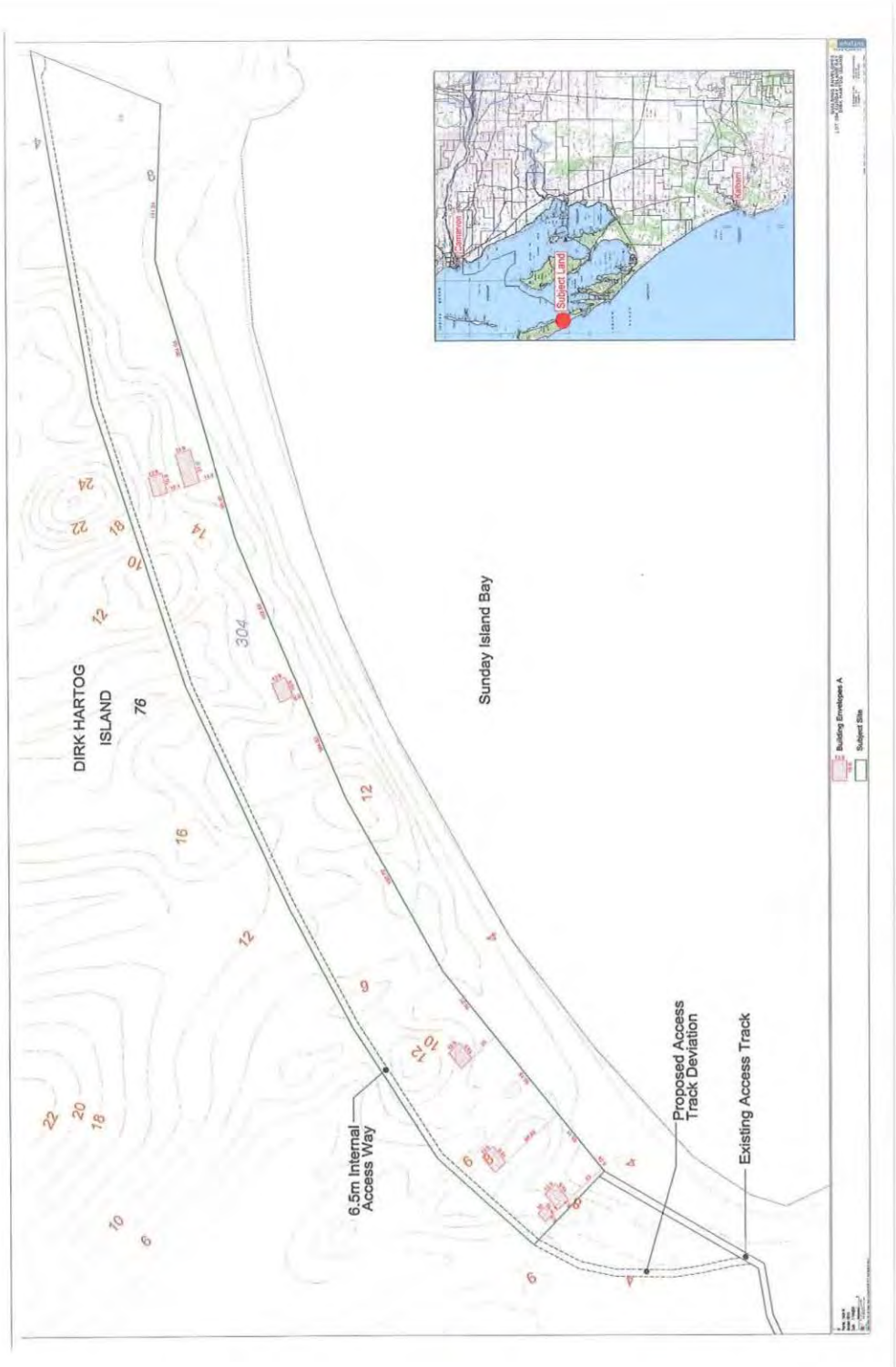
HISTORICAL/ARCHEOLOGICAL SURVEYS/APPROVALS

There are no places or objects located on the site or adjacent to the site that are listed or proposed for national, state or local preservation registers
There are no buildings or archaeological sites which would be affected by development of the site
The site has been cleared of Native Title by representatives of the MALGANA PEOPLE and their representative anthropologist/archaeologist during survey in 2008. The owner of the land has entered into a transferrable agreement with the Malgana People in regard to employment and on site information signage in regard to Malgana heritage.

TRANSPORTATION IMPACTS

The project will not require new roads or tracks to access the site.
Agreement has been formalized with DPaW to allow a number of access points over the narrow piece of foreshore National Park between the beach and Lot 304 during the building phase and to negotiate similar access routes for guests following the completion of the development either in total or staged completions.
During the building phase these access routes are to be via raised ramps to protect any damage to the vegetation in this area.
It is proposed that during the construction stage all materials will be delivered via barge directly to the beach before transport across the park strip to each building site.

Proposed seven Accommodation unit layout



Building Footprint seven accommodation units

SECTION IV

APPENDIX 1

1 CLIMATE, VEGETATION, GEOLOGY

a. REGIONAL SETTING

Dirk Hartog Island is the largest island off the west coast of Australia and is the site of the first recorded landing of a European on Australian soil in October 1616. It is located within the Shark Bay World Heritage Property adjacent to the Shark Bay Marine Park and has been declared a National Park.

Dirk Hartog Island is located on the Edel and Shark Bay 1:250,000 map sheets. The nearest point of the island lies about 35 kms in a westerly direction from Denham across Denham Sound. The island is almost 80kms long by about 10kms wide and lies at the western side of Shark Bay with its long axis in a south east to north west direction.

Sunday Island Bay is located towards the south east of the island some 5 kms from Cape Ransonnett the most southerly point on the east coast of the island : this is approximately 5kms from Steep Point the most Westerly point of Australia.

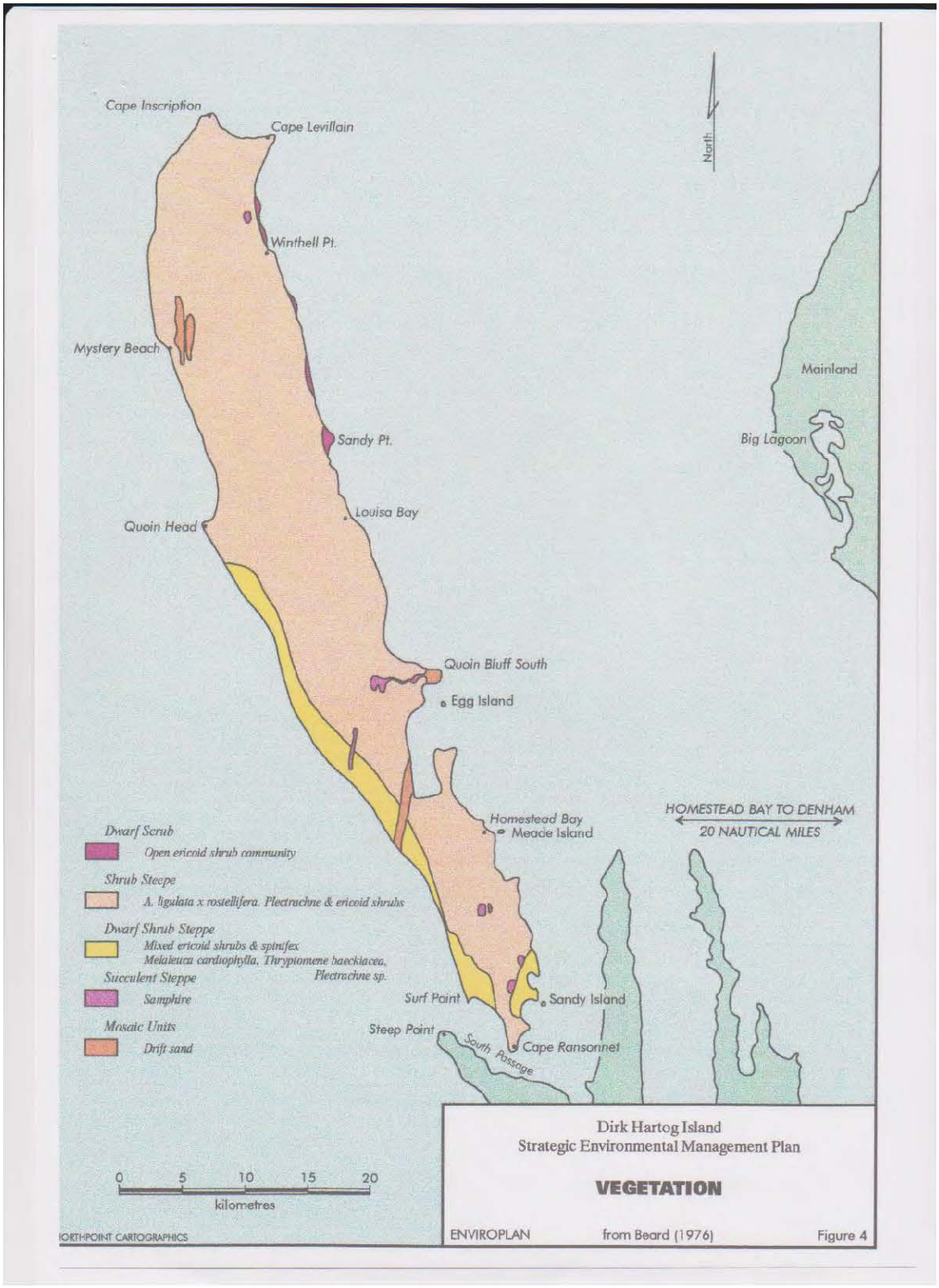
The site is comprised of Lot 304 on Deposited Plan 50257 Sunday Island Bay. The 11.2985ha site is one of four freehold locations on Dirk Hartog Island. There are two freehold lots located at Sunday Island Bay and two freehold lots located at Homestead Bay

b. CLIMATE

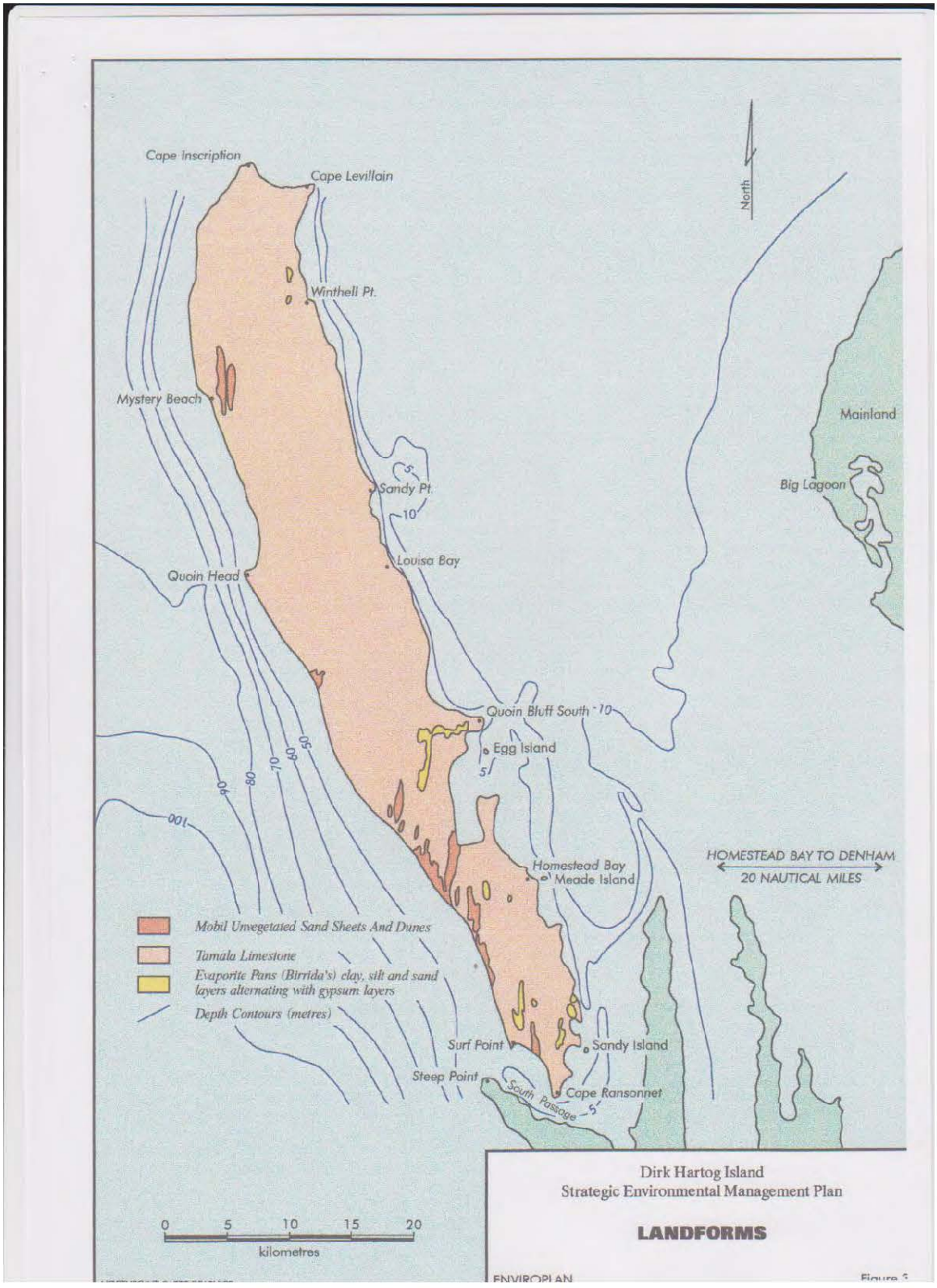
The site is located midway between the northern and southern climatic regions. It experiences a Mediterranean climate with hot dry summers but only moderately cool winters when it also receives its major rainfall. Being at the bottom edge of the cyclone zone it may also receive cyclonic rain over summer; this however is not consistent.

The average rainfall for Denham, the nearest town to the site, is approx. 200mm per annum with the majority falling during winter. Cyclonic summer rain can double the rainfall received each year, however significant falls have only occurred infrequently (five times in the last twenty years). These occasional summer storms have not caused any major erosion but directly contribute to the ground water of Dirk Hartog Island.

The predominant wind direction recorded at the site is southwest to westerly in the afternoon and easterly to south easterly in the mornings during the months of April through to October. Over the summer months the predominant winds are south westerly for most of the time as indicated in the attached tables. The site faces due south.*(see attached wind recordings in tables 5 and 6)*



Map 2-Vegetation Dirk Hartog Island



Map 3-Landforms Dirk Hartog Island

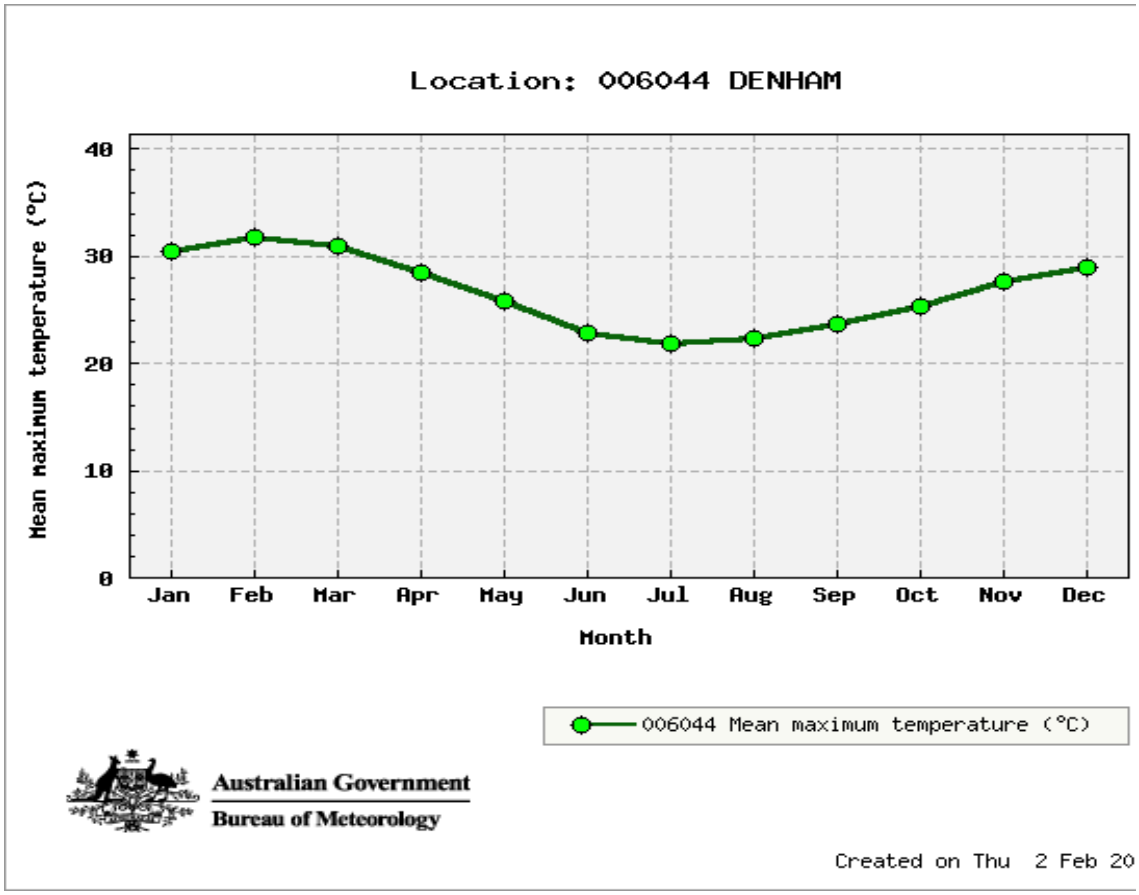


Table 1 - MEAN MAXIMUM TEMPERATURE DENHAM

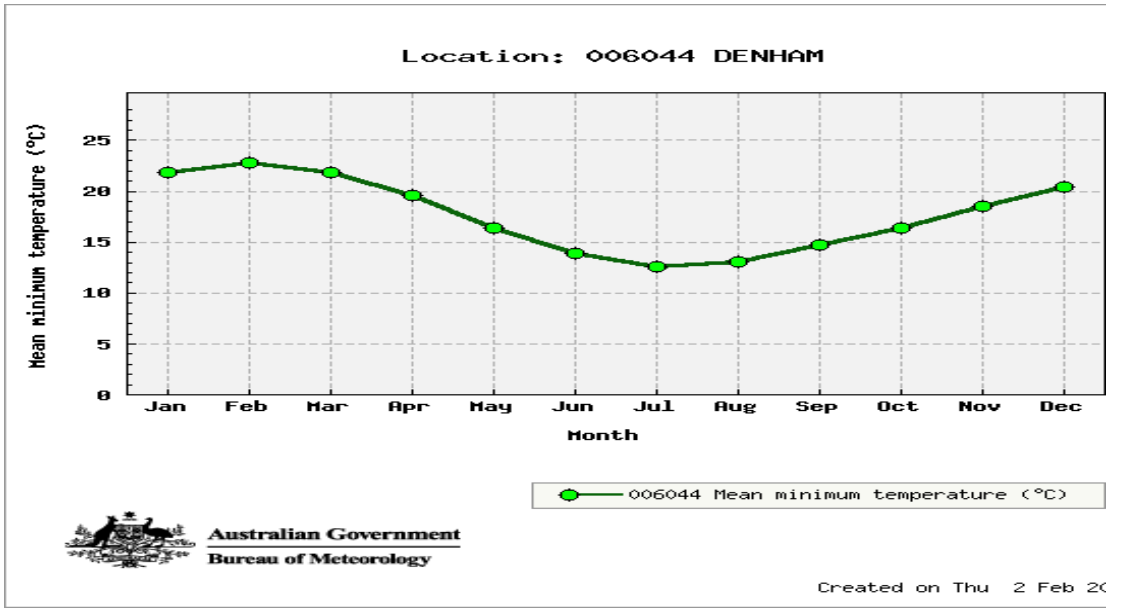


Table 2 - MEAN MINIMUM TEMPERATURE DENHAM

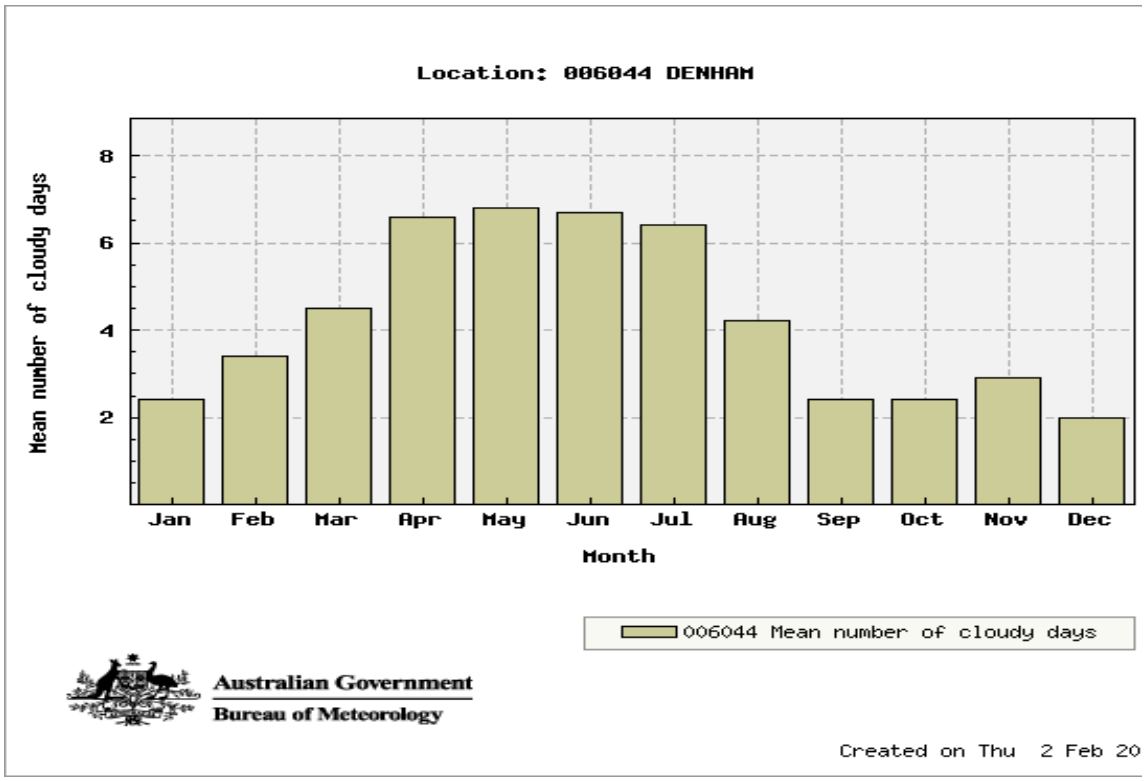


Table-3 - MEAN NUMBER OF CLOUDY DAYS DENHAM

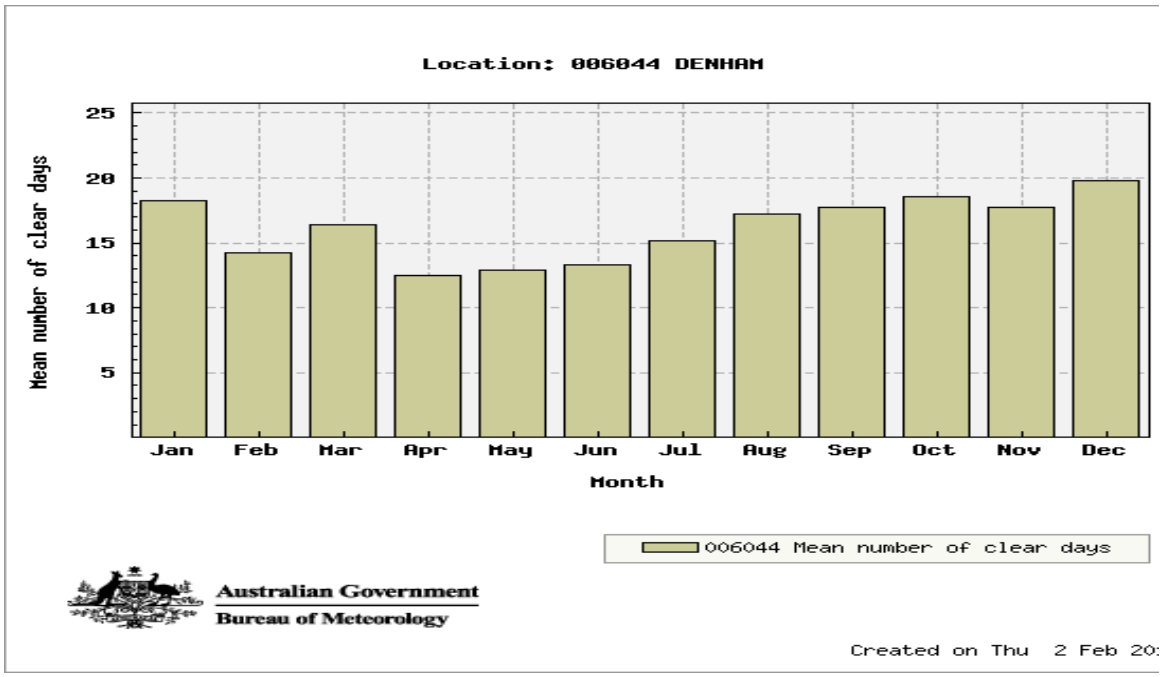
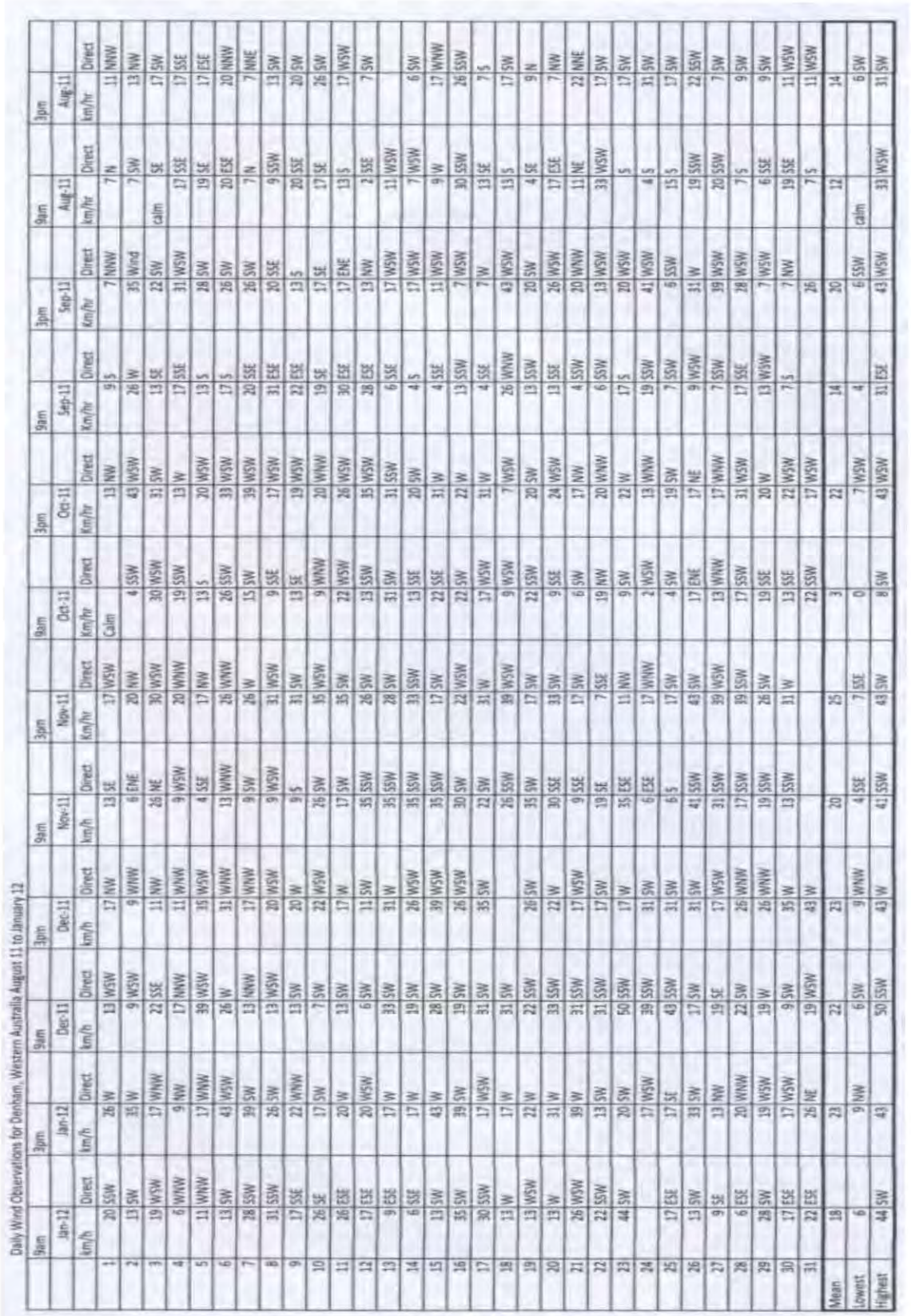


Table 4 - MEAN NUMBER OF CLEAR DAYS



Daily Wind Observations for Denham, Western Australia August 11 to January 12

	9am		3pm		9am		3pm		9am		3pm		9am		3pm		9am		3pm	
	Jan-12		Jan-12		Dec-11		Dec-11		Nov-11		Nov-11		Oct-11		Oct-11		Sep-11		Sep-11		Aug-11		Aug-11	
	km/h	Direct	km/h	Direct	km/h	Direct	km/h	Direct	km/h	Direct	Km/hr	Direct	Km/hr	Direct	Km/hr	Direct	Km/hr	Direct	Km/hr	Direct	km/hr	Direct	km/hr	Direct
1	20	SSW	26	W		13	WSW	17	NW		13	SE		17	WSW	Calm		13	NW		9	S	7	N		11	NNW
2	13	SW	35	W		9	WSW	9	WNW		6	ENE		20	NW		4	SSW	43	WSW		26	W	35	Wind	7	SW		13	NW
3	19	WSW	17	WNW		22	SSE	11	NW		26	NE		30	WSW		30	WSW	31	SW		13	SE	22	SW	calm	SE		17	SW
4	6	WNW	9	NW		17	NNW	11	WNW		9	WSW		20	WNW		19	SSW	13	W		17	SSE	31	WSW		17	SSE		17	SSE
5	11	WNW	17	WNW		39	WSW	35	WSW		4	SSE		17	NW		13	S	20	WSW		13	S	28	SW		19	SE		17	ESE
6	13	SW	43	WSW		26	W	31	WNW		13	WNW		26	WNW		26	SSW	33	WSW		17	S	26	SW		20	ESE		20	NNW
7	28	SSW	39	SW		13	NNW	17	WNW		9	SW		26	W		15	SW	39	WSW		20	SSE	26	SW		7	N		7	NNE
8	31	SSW	26	SW		13	WSW	20	WSW		9	WSW		31	WSW		9	SSE	17	WSW		31	ESE	20	SSE		9	SSW		13	SW
9	17	SSE	22	WNW		13	SW	20	W		9	S		31	SW		13	SE	19	WSW		22	ESE	13	S		20	SSE		20	SW
10	26	SE	17	SW		7	SW	22	WSW		26	SW		35	WSW		9	WNW	20	WNW		19	SE	17	SE		17	SE		26	SW
11	26	ESE	20	W		13	SW	17	W		17	SW		35	SW		22	WSW	26	WSW		30	ESE	17	ENE		13	S		17	WSW
12	17	ESE	20	WSW		6	SW	11	SW		35	SSW		26	SW		13	SSW	35	WSW		28	ESE	13	NW		2	SSE		7	SW
13	9	ESE	17	W		33	SW	31	W		35	SSW		28	SW		31	SW	31	SSW		6	SSE	17	WSW		11	WSW			
14	6	SSE	17	W		19	SW	26	WSW		35	SSW		33	SSW		13	SSE	20	SW		4	S	17	WSW		7	WSW		6	SW
15	13	SW	43	W		28	SW	39	WSW		35	SSW		17	SW		22	SSE	31	W		4	SSE	11	WSW		9	W		17	WNW
16	35	SW	39	SW		19	SW	26	WSW		30	SW		22	WSW		22	SW	22	W		13	SSW	7	WSW		30	SSW		26	SSW
17	30	SSW	17	WSW		31	SW	35	SW		22	SW		31	W		17	WSW	31	W		4	SSE	7	W		13	SE		7	S
18	13	W	17	W		31	SW				26	SSW		39	WSW		9	WSW	7	WSW		26	WNW	43	WSW		13	S		17	SW
19	13	WSW	22	W		22	SSW	26	SW		35	SW		17	SW		22	SSW	20	SW		13	SSW	20	SW		4	SE		9	N
20	13	W	31	W		33	SSW	22	W		30	SSE		33	SW		9	SSE	24	WSW		13	SSE	26	WSW		17	ESE		7	NW
21	26	WSW	39	W		31	SSW	17	WSW		9	SSE		17	SW		6	SW	17	NW		4	SSW	20	WNW		11	NE		22	NNE
22	22	SSW	13	SW		31	SSW	17	SW		19	SE		7	SSE		19	NW	20	WNW		6	SSW	13	WSW		33	WSW		17	SW
23	44	SW	20	SW		50	SSW	17	W		35	ESE		11	NW		9	SW	22	W		17	S	20	WSW		5			17	SW
24			17	WSW		39	SSW	31	SW		6	ESE		17	WNW		2	WSW	13	WNW		19	SSW	41	WSW		4	S		31	SW
25	17	ESE	17	SE		43	SSW	31	SW		6	S		17	SW		4	SW	19	SW		7	SSW	6	SSW		15	S		17	SW
26	13	SW	33	SW		17	SW	31	SW		41	SSW		43	SW		17	ENE	17	NE		9	WSW	31	W		19	SSW		22	SSW
27	9	SE	13	NW		19	SE	17	WSW		31	SSW		39	WSW		13	WNW	17	WNW		7	SSW	39	WSW		26	SSW		7	SW
28	6	ESE	20	WNW		22	SW	26	WNW		17	SSW		39	SSW		17	SSW	31	WSW		17	SSE	28	WSW		7	S		9	SW
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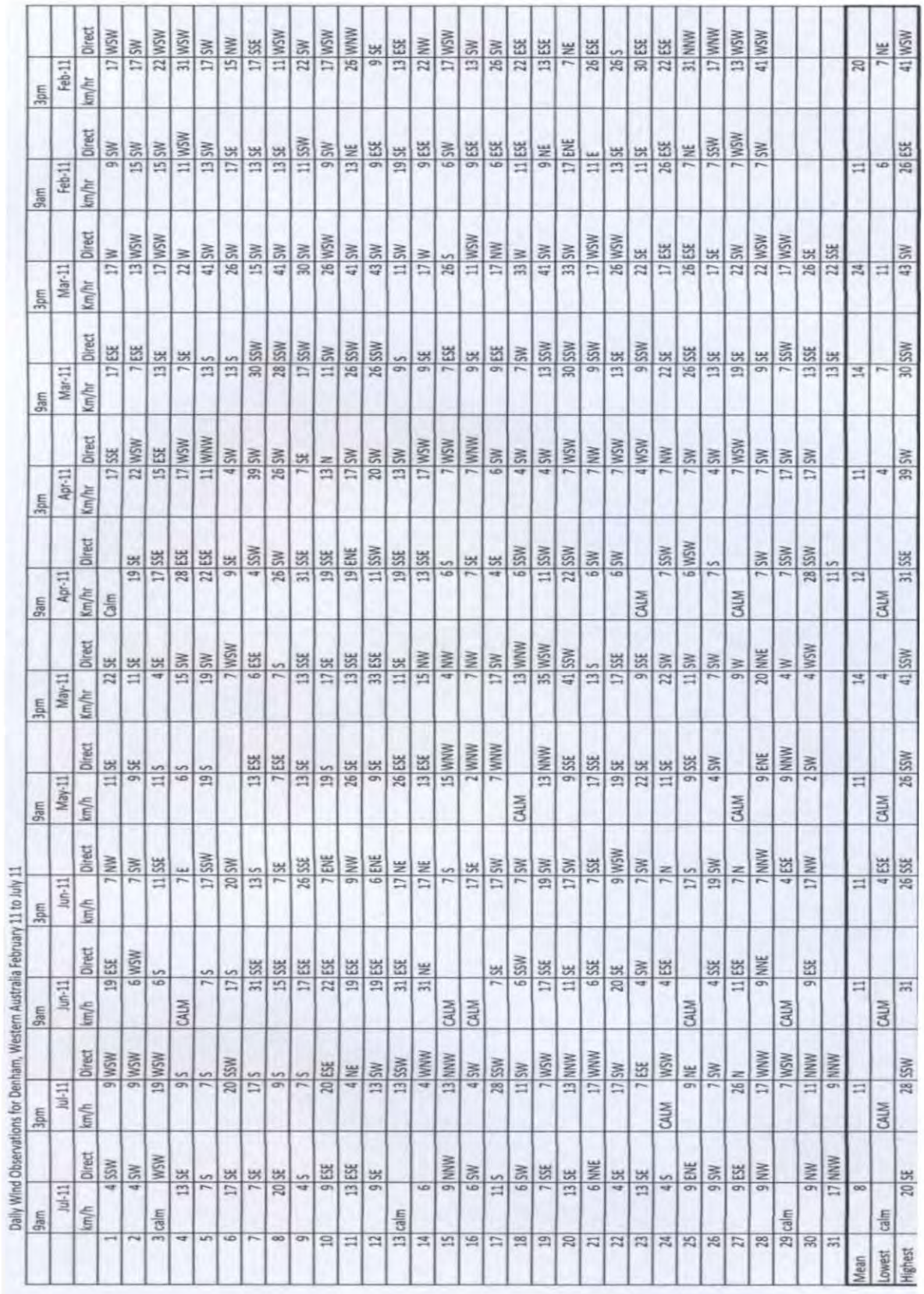
30	17	ESE	17	WSW		9	SW	35	W		13	SSW		31	W		13	SSE	22	WSW		7	S	7	NW		19	SSE		11	WSW
31	22	ESE	26	NE		19	WSW	43	W								22	SSW	17	WSW				26			7	S		11	WSW
Mean	18		23			22		23			20			25			3		22			14		30			12			14	
Lowest	6		9	NW		6	SW	9	WNW		4	SSE		7	SSE		0		7	WSW		4		6	SSW	calm			6	SW
Highest	44	SW	43			50	SSW	43	W		41	SSW		43	SW		8	SW	43	WSW		31	ESE	43	WSW		33	WSW		31	SW

Table 5 - WIND OBSERVATIONS DENHAM AUGUST 2011-JANUARY 2012



Daily Wind Observations for Denham, Western Australia February 11 to July 11

	9am		3pm		9am		3pm		9am		3pm		9am		3pm		9am		3pm	
	Jul-11		Jul-11		Jun-11		Jun-11		May-11		May-11		Apr-11		Apr-11		Mar-11		Mar-11		Feb-11		Feb-11	
	km/h	Direct	km/h	Direct	km/h	Direct	km/h	Direct	km/h	Direct	Km/hr	Direct	Km/hr	Direct	Km/hr	Direct	Km/hr	Direct	Km/hr	Direct	km/hr	Direct	km/hr	Direct
1	4	SSW	9	WSW	19	ESE	7	NW	11	SE	22	SE	Calm		17	SSE	17	ESE	17	W	9	SW	17	WSW
2	4	SW	9	WSW	6	WSW	7	SW	9	SE	11	SE	19	SE	22	WSW	7	ESE	13	WSW	15	SW	17	SW
3	calm	WSW	19	WSW	6	S	11	SSE	11	S	4	SE	17	SSE	15	ESE	13	SE	17	WSW	15	SW	22	WSW
4	13	SE	9	S	CALM		7	E	6	S	15	SW	28	ESE	17	WSW	7	SE	22	W	11	WSW	31	WSW
5	7	S	7	S	7	S	17	SSW	19	S	19	SW	22	ESE	11	WNW	13	S	41	SW	13	SW	17	SW
6	17	SE	20	SSW	17	S	20	SW			7	WSW	9	SE	4	SW	13	S	26	SW	17	SE	15	NW
7	7	SE	17	S	31	SSE	13	S	13	ESE	6	ESE	4	SSW	39	SW	30	SSW	15	SW	13	SE	17	SSE
8	20	SE	9	S	15	SSE	7	SE	7	ESE	7	S	26	SW	26	SW	28	SSW	41	SW	13	SE	11	WSW
9	4	S	7	S	17	ESE	26	SSE	13	SE	13	SSE	31	SSE	7	SE	17	SSW	30	SW	11	SSW	22	SW
10	9	ESE	20	ESE	22	ESE	7	ENE	19	S	17	SE	19	SSE	13	N	11	SW	26	WSW	9	SW	17	WSW
11	13	ESE	4	NE	19	ESE	9	NW	26	SE	13	SSE	19	ENE	17	SW	26	SSW	41	SW	13	NE	26	WNW
12	9	SE	13	SW	19	ESE	6	ENE	9	SE	33	ESE	11	SSW	20	SW	26	SSW	43	SW	9	ESE	9	SE
13	calm		13	SSW	31	ESE	17	NE	26	ESE	11	SE	19	SSE	13	SW	9	S	11	SW	19	SE	13	ESE
14	6		4	WNW	31	NE	17	NE	13	ESE	15	NW	13	SSE	17	WSW	9	SE	17	W	9	ESE	22	NW
15	9	NNW	13	NNW	CALM		7	S	15	WNW	4	NW	6	S	7	WSW	7	ESE	26	S	6	SW	17	WSW
16	6	SW	4	SW	CALM		17	SE	2	WNW	7	NW	7	SE	7	WNW	9	SE	11	WSW	9	ESE	13	SW
17	11	S	28	SSW	7	SE	17	SW	7	WNW	17	SW	4	SE	6	SW	9	ESE	17	NW	6	ESE	26	SW
18	6	SW	11	SW	6	SSW	7	SW	CALM		13	WNW	6	SSW	4	SW	7	SW	33	W	11	ESE	22	ESE
19	7	SSE	7	WSW	17	SSE	19	SW	13	NNW	35	WSW	11	SSW	4	SW	13	SSW	41	SW	9	NE	13	ESE
20	13	SE	13	NNW	11	SE	17	SW	9	SSE	41	SSW	22	SSW	7	WSW	30	SSW	33	SW	17	ENE	7	NE
21	6	NNE	17	WNW	6	SSE	7	SSE	17	SSE	13	S	6	SW	7	NW	9	SSW	17	WSW	11	E	26	ESE
22	4	SE	17	SW	20	SE	9	WSW	19	SE	17	SSE	6	SW	7	WSW	13	SE	26	WSW	13	SE	26	S
23	13	SE	7	ESE	4	SW	7	SW	22	SE	9	SSE	CALM		4	WSW	9	SSW	22	SE	11	SE	30	ESE
24	4	S	CALM	WSW	4	ESE	7	N	11	SE	22	SW	7	SSW	7	NW	22	SE	17	ESE	26	ESE	22	ESE
25	9	ENE	9	NE	CALM		17	S	9	SSE	11	SW	6	WSW	7	SW	26	SSE	26	ESE	7	NE	31	NNW
26	9	SW	7	SW	4	SSE	19	SW	4	SW	7	SW	7	S	4	SW	13	SE	17	SE	7	SSW	17	WNW
27	9	ESE	26	N	11	ESE	7	N	CALM		9	W	CALM		7	WSW	19	SE	22	SW	7	WSW	13	WSW
28	9	NW	17	WNW	9	NNE	7	NNW	9	ENE	20	NNE	7	SW	7	SW	9	SE	22	WSW	7	SW	41	WSW
29	calm		7	WSW	CALM		4	ESE	9	NNW	4	W	7	SSW	17	SW	7	SSW	17	WSW				
30	9	NW	11	NNW	9	ESE	17	NW	2	SW	4	WSW	28	SSW	17	SW	13	SSE	26	SE				
31	17	NNW	9	NNW									11	S			13	SE	22	SSE				
Mean	8		11		11		11		11		14		12		11		14		24		11		20	
Lowest	calm		CALM		CALM		4	ESE	CALM		4		CALM		4		7		11		6		7	NE
Highest	20	SE	28	SSW	31		26	SSE	26	SSW	41	SSW	31	SSE	39	SW	30	SSW	43	SW	26	ESE	41	WSW

Table 6 - WIND OBSERVATIONS DENHAM FEBRUARY 2011-JULY 2011

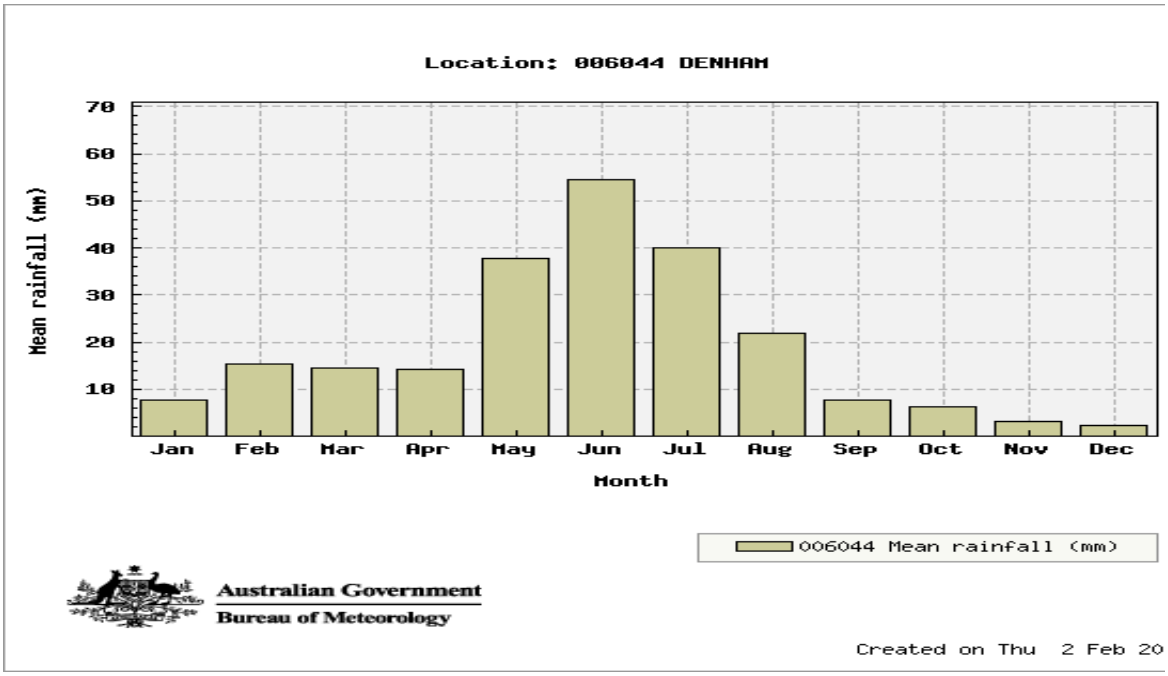


Table 7 - Mean Rainfall Denham

c. TOPOGRAPHY

Five land systems occur on Dirk Hartog Island three of which(Coast, Edel and Inscription) collectively make up 99% of the entire islands area.

The site at Sunday Island Bay is classified within the Edel Land System which comprises approx. 32.5% of the total island area and occurs in the eastern and south eastern parts of the island. It consists of undulating sandy plains with minor low dunes, limestone rises and some saline flats, low cliffs and tall or low heath.

Lot 304 is undulating with hills and reentrants which allow full protection from the prevailing wind, spectacular views and the opportunity to create a world class wilderness tourism destination. From the southern boundary located at 5m AHD the site rises to between 10 and 20m AHD at various points on the lot.

The vegetation of the Edel Land System consists of tall and or low open heath or low shrub land and is atypical to the eastern coastline of the island. Typically the soils of Dirk Hartog Island are sandy. In the proposed development area(Lot 304) the soils are similar but contain a high proportion of limestone outcrops particularly to the east of the site.

d. GEOLOGY AND SOILS

Typically of the Edel Land System ,(sand and sand over limestone) the Sunday Island Bay site is sand over limestone and minimal sand over limestone anchored by a stable

native vegetation cover typical of the Edel Land System. This provides Sunday Island Bay with a very suitable building base. Based on the depth of the existing wells on the east coast of Dirk Hartog Island the ground water is between 10meters and 25 meters below the proposed building and infrastructure sites.

e. WATER

There are no wetlands occurring on the property.

DIRK HARTOG ISLAND

Plants of the SUNDAY ISLAND BAY site,

Plant species, and their collection numbers are tabulated below in alphabetic order. (Collection numbers are included for reference).

No attempt was made to evaluate absolute or relative species numbers, preferential habitat, or associations.

SPECIES NAME	Collection Number
Acacia coriacea (subsp. coriacea)	13
Acacia ligulata	21, 122
? Acacia sp(1).	6
? Acacia sp(2.	18
Acanthocarpus preissei	15, 3
Acanthocarpus sp. probably robustus	11
Austrostipa elegantissima	25
Bossiaea spinescens	4
Calandrinia polyandra	113
Chenopodium cristate	22, 106
Coastal succulent	34
Cynodon dactylon	123
Danthonia sp.	30
Dicrastis sp. (?white flower)	23
Diplolaena grandiflora	10, 102
?Eragrostis sp.	116
Eremophila glabra (red flowering)	28, 116
?Eriochne sp.	112
Euphorbia sharkoensis	16. 110
Exocarpus aphyllus	27
Frankinia pauciflora (?var pauciflora)	9, 18, 111
Nitraria scholberi	36
Pimelia microcephala	32, 108, 118
Pittosporum phylliraeoides	33
Rhagodia sp.	35
Scaevola ?anchusifolia	102
Scaevola ?crassifolia	14
Scaevola tomentosa	8, 5
Sporobolus mitchellii	101
Succulent sp	29, 115
Swainsonia longicarinata	7
Thryptomene baeckeacea	109
Zygophyllum fruticulosum	19, 23, 31, 107

DHI SIB plant 2

Table 8 – Botanical List Sunday Island Bay Lot 304

DIRK HARTOG ISLAND

Plants of the SUNDAY ISLAND BAY site.

Vegetation of the site was collected on 17/7/08 and 19/7/08. The site is a strip of near coastal land, roughly parallel to the beach, and lies along two sets of orthogonal dunes. The principal set are parallel to the coast; the secondary set are at right angles, and superficial to the main set, but influence plant densities. Plant cover on ridge tops was about 50%, whereas in the shallow gullies it was about 80+%. A similar effect was noted for distance from the ocean. The same plant species were observed in similar locations at all parts of the site. There was no visible difference between the plants on the site, and those on similar, adjacent sites.

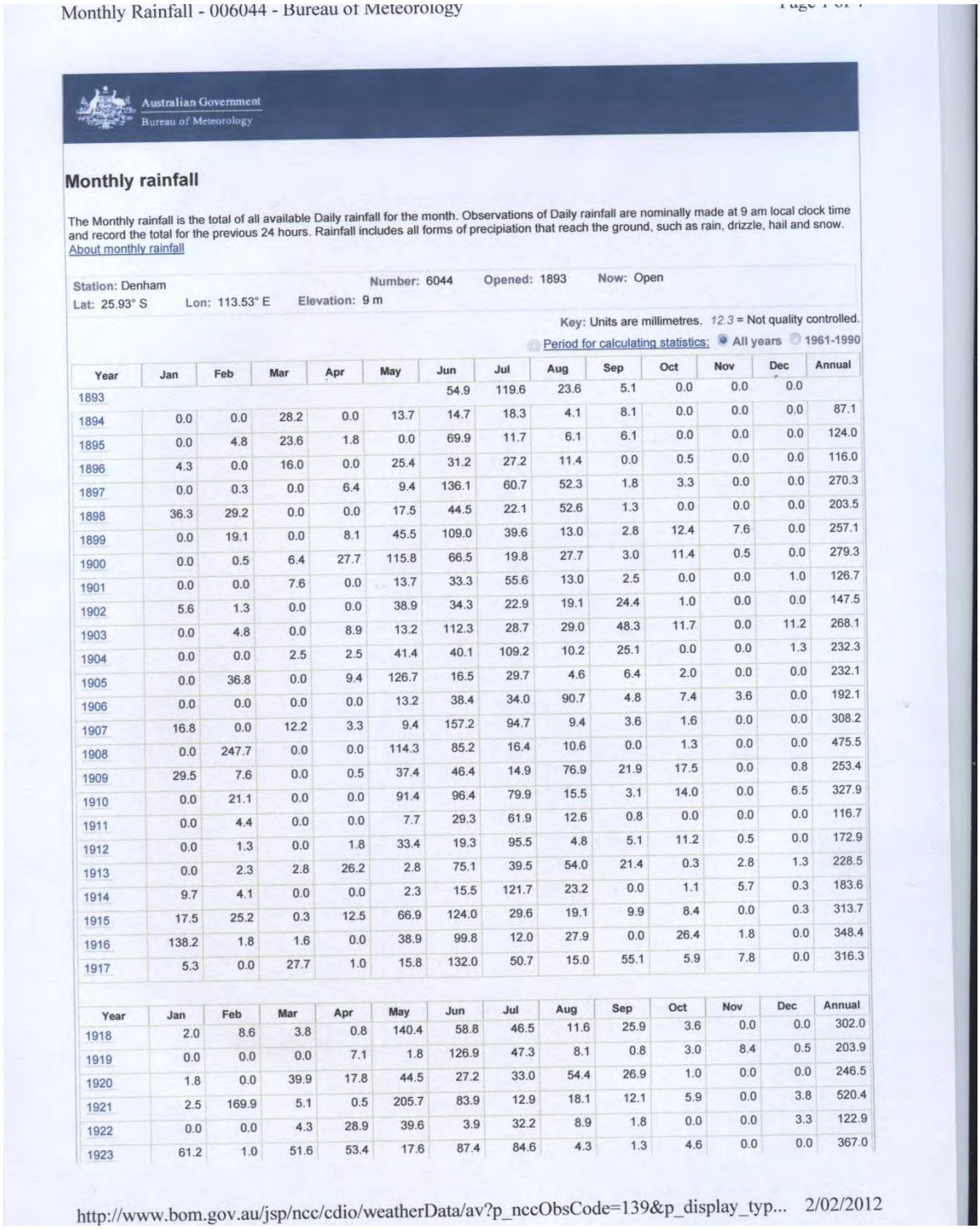
The soil was sand throughout, slightly darker and more consolidated further from the beach.

In all, 49 samples were collected from this site, and 35 plant species identified. Pressed specimens were prepared of all, except one very distinctive specie:-
(Calandrinia polyandra).

SIB 1

Table 9 - Lot 304 Sunday Island Bay Plant Survey

Map – 4 Wilderness Areas Shark Bay (arrow to Sunday Island Bay)



Monthly Rainfall - 006044 - Bureau of Meteorology

Australian Government
Bureau of Meteorology

Monthly rainfall

The Monthly rainfall is the total of all available Daily rainfall for the month. Observations of Daily rainfall are nominally made at 9 am local clock time and record the total for the previous 24 hours. Rainfall includes all forms of precipiation that reach the ground, such as rain, drizzle, hail and snow.
About monthly rainfall

Station: Denham Number: 6044 Opened: 1893 Now: Open
Lat: 25.93° S Lon: 113.53° E Elevation: 9 m

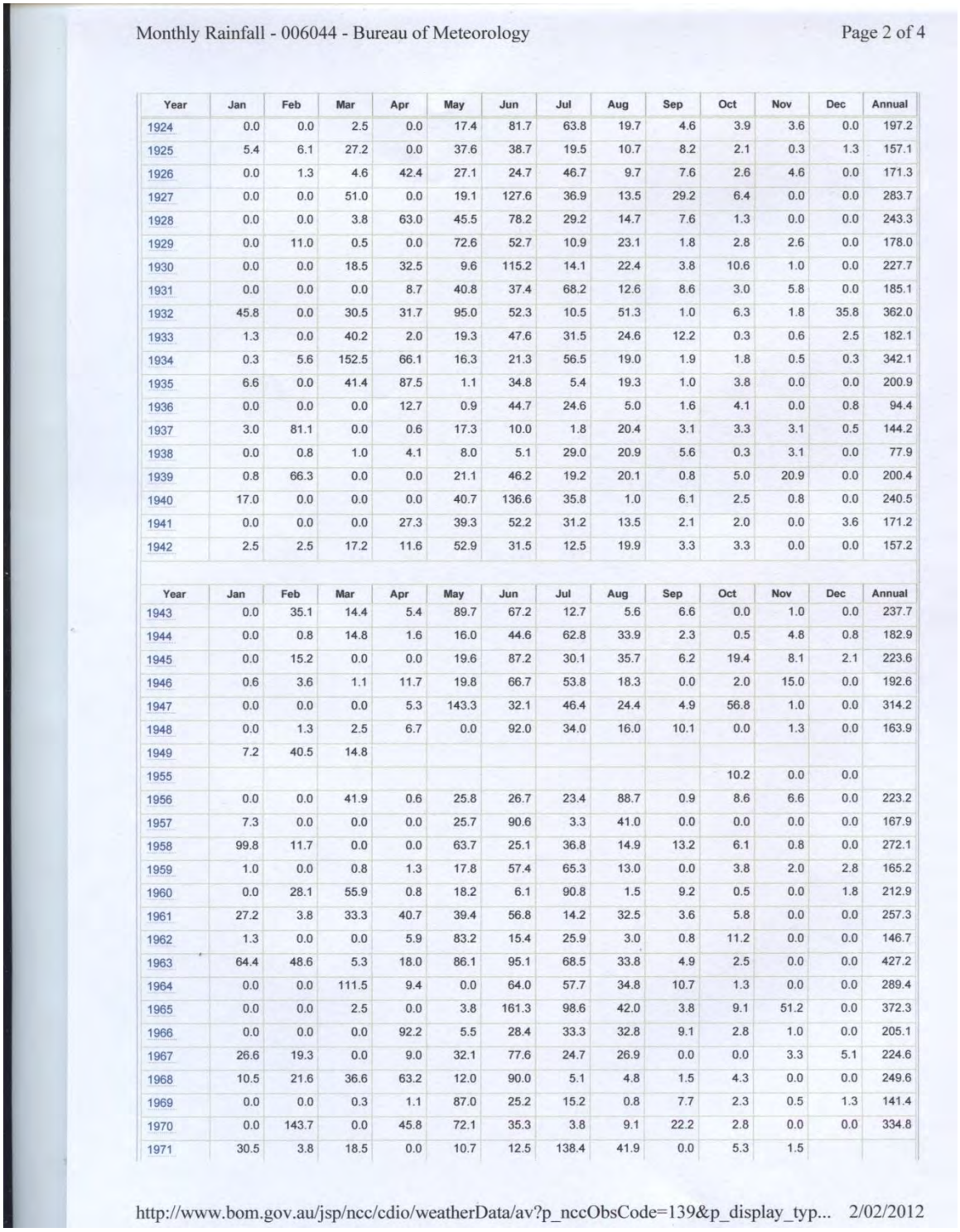
Key: Units are millimetres. *12.3* = Not quality controlled.
Period for calculating statistics: All years 1961-1990

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1893						54.9	119.6	23.6	5.1	0.0	0.0	0.0	
1894	0.0	0.0	28.2	0.0	13.7	14.7	18.3	4.1	8.1	0.0	0.0	0.0	87.1
1895	0.0	4.8	23.6	1.8	0.0	69.9	11.7	6.1	6.1	0.0	0.0	0.0	124.0
1896	4.3	0.0	16.0	0.0	25.4	31.2	27.2	11.4	0.0	0.5	0.0	0.0	116.0
1897	0.0	0.3	0.0	6.4	9.4	136.1	60.7	52.3	1.8	3.3	0.0	0.0	270.3
1898	36.3	29.2	0.0	0.0	17.5	44.5	22.1	52.6	1.3	0.0	0.0	0.0	203.5
1899	0.0	19.1	0.0	8.1	45.5	109.0	39.6	13.0	2.8	12.4	7.6	0.0	257.1
1900	0.0	0.5	6.4	27.7	115.8	66.5	19.8	27.7	3.0	11.4	0.5	0.0	279.3
1901	0.0	0.0	7.6	0.0	13.7	33.3	55.6	13.0	2.5	0.0	0.0	1.0	126.7
1902	5.6	1.3	0.0	0.0	38.9	34.3	22.9	19.1	24.4	1.0	0.0	0.0	147.5
1903	0.0	4.8	0.0	8.9	13.2	112.3	28.7	29.0	48.3	11.7	0.0	11.2	268.1
1904	0.0	0.0	2.5	2.5	41.4	40.1	109.2	10.2	25.1	0.0	0.0	1.3	232.3
1905	0.0	36.8	0.0	9.4	126.7	16.5	29.7	4.6	6.4	2.0	0.0	0.0	232.1
1906	0.0	0.0	0.0	0.0	13.2	38.4	34.0	90.7	4.8	7.4	3.6	0.0	192.1
1907	16.8	0.0	12.2	3.3	9.4	157.2	94.7	9.4	3.6	1.6	0.0	0.0	308.2
1908	0.0	247.7	0.0	0.0	114.3	85.2	16.4	10.6	0.0	1.3	0.0	0.0	475.5
1909	29.5	7.6	0.0	0.5	37.4	46.4	14.9	76.9	21.9	17.5	0.0	0.8	253.4
1910	0.0	21.1	0.0	0.0	91.4	96.4	79.9	15.5	3.1	14.0	0.0	6.5	327.9
1911	0.0	4.4	0.0	0.0	7.7	29.3	61.9	12.6	0.8	0.0	0.0	0.0	116.7
1912	0.0	1.3	0.0	1.8	33.4	19.3	95.5	4.8	5.1	11.2	0.5	0.0	172.9
1913	0.0	2.3	2.8	26.2	2.8	75.1	39.5	54.0	21.4	0.3	2.8	1.3	228.5
1914	9.7	4.1	0.0	0.0	2.3	15.5	121.7	23.2	0.0	1.1	5.7	0.3	183.6
1915	17.5	25.2	0.3	12.5	66.9	124.0	29.6	19.1	9.9	8.4	0.0	0.3	313.7
1916	138.2	1.8	1.6	0.0	38.9	99.8	12.0	27.9	0.0	26.4	1.8	0.0	348.4
1917	5.3	0.0	27.7	1.0	15.8	132.0	50.7	15.0	55.1	5.9	7.8	0.0	316.3

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1918	2.0	8.6	3.8	0.8	140.4	58.8	46.5	11.6	25.9	3.6	0.0	0.0	302.0
1919	0.0	0.0	0.0	7.1	1.8	126.9	47.3	8.1	0.8	3.0	8.4	0.5	203.9
1920	1.8	0.0	39.9	17.8	44.5	27.2	33.0	54.4	26.9	1.0	0.0	0.0	246.5
1921	2.5	169.9	5.1	0.5	205.7	83.9	12.9	18.1	12.1	5.9	0.0	3.8	520.4
1922	0.0	0.0	4.3	28.9	39.6	3.9	32.2	8.9	1.8	0.0	0.0	3.3	122.9
1923	61.2	1.0	51.6	53.4	17.6	87.4	84.6	4.3	1.3	4.6	0.0	0.0	367.0

http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_typ... 2/02/2012

Table 10 – Bureau of Meteorology Monthly Rainfall Denham



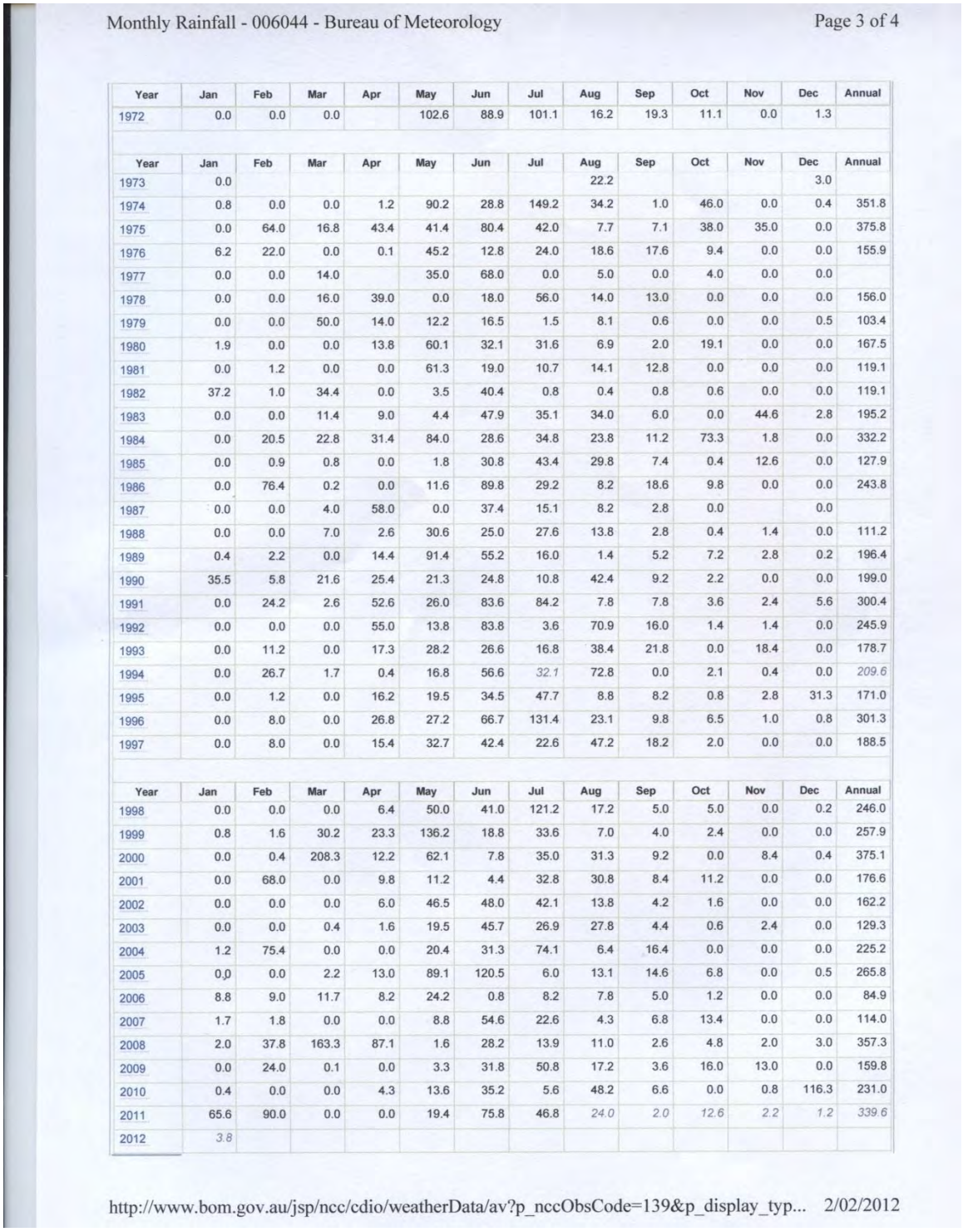
Monthly Rainfall - 006044 - Bureau of Meteorology Page 2 of 4

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1924	0.0	0.0	2.5	0.0	17.4	81.7	63.8	19.7	4.6	3.9	3.6	0.0	197.2
1925	5.4	6.1	27.2	0.0	37.6	38.7	19.5	10.7	8.2	2.1	0.3	1.3	157.1
1926	0.0	1.3	4.6	42.4	27.1	24.7	46.7	9.7	7.6	2.6	4.6	0.0	171.3
1927	0.0	0.0	51.0	0.0	19.1	127.6	36.9	13.5	29.2	6.4	0.0	0.0	283.7
1928	0.0	0.0	3.8	63.0	45.5	78.2	29.2	14.7	7.6	1.3	0.0	0.0	243.3
1929	0.0	11.0	0.5	0.0	72.6	52.7	10.9	23.1	1.8	2.8	2.6	0.0	178.0
1930	0.0	0.0	18.5	32.5	9.6	115.2	14.1	22.4	3.8	10.6	1.0	0.0	227.7
1931	0.0	0.0	0.0	8.7	40.8	37.4	68.2	12.6	8.6	3.0	5.8	0.0	185.1
1932	45.8	0.0	30.5	31.7	95.0	52.3	10.5	51.3	1.0	6.3	1.8	35.8	362.0
1933	1.3	0.0	40.2	2.0	19.3	47.6	31.5	24.6	12.2	0.3	0.6	2.5	182.1
1934	0.3	5.6	152.5	66.1	16.3	21.3	56.5	19.0	1.9	1.8	0.5	0.3	342.1
1935	6.6	0.0	41.4	87.5	1.1	34.8	5.4	19.3	1.0	3.8	0.0	0.0	200.9
1936	0.0	0.0	0.0	12.7	0.9	44.7	24.6	5.0	1.6	4.1	0.0	0.8	94.4
1937	3.0	81.1	0.0	0.6	17.3	10.0	1.8	20.4	3.1	3.3	3.1	0.5	144.2
1938	0.0	0.8	1.0	4.1	8.0	5.1	29.0	20.9	5.6	0.3	3.1	0.0	77.9
1939	0.8	66.3	0.0	0.0	21.1	46.2	19.2	20.1	0.8	5.0	20.9	0.0	200.4
1940	17.0	0.0	0.0	0.0	40.7	136.6	35.8	1.0	6.1	2.5	0.8	0.0	240.5
1941	0.0	0.0	0.0	27.3	39.3	52.2	31.2	13.5	2.1	2.0	0.0	3.6	171.2
1942	2.5	2.5	17.2	11.6	52.9	31.5	12.5	19.9	3.3	3.3	0.0	0.0	157.2

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1943	0.0	35.1	14.4	5.4	89.7	67.2	12.7	5.6	6.6	0.0	1.0	0.0	237.7
1944	0.0	0.8	14.8	1.6	16.0	44.6	62.8	33.9	2.3	0.5	4.8	0.8	182.9
1945	0.0	15.2	0.0	0.0	19.6	87.2	30.1	35.7	6.2	19.4	8.1	2.1	223.6
1946	0.6	3.6	1.1	11.7	19.8	66.7	53.8	18.3	0.0	2.0	15.0	0.0	192.6
1947	0.0	0.0	0.0	5.3	143.3	32.1	46.4	24.4	4.9	56.8	1.0	0.0	314.2
1948	0.0	1.3	2.5	6.7	0.0	92.0	34.0	16.0	10.1	0.0	1.3	0.0	163.9
1949	7.2	40.5	14.8										
1955										10.2	0.0	0.0	
1956	0.0	0.0	41.9	0.6	25.8	26.7	23.4	88.7	0.9	8.6	6.6	0.0	223.2
1957	7.3	0.0	0.0	0.0	25.7	90.6	3.3	41.0	0.0	0.0	0.0	0.0	167.9
1958	99.8	11.7	0.0	0.0	63.7	25.1	36.8	14.9	13.2	6.1	0.8	0.0	272.1
1959	1.0	0.0	0.8	1.3	17.8	57.4	65.3	13.0	0.0	3.8	2.0	2.8	165.2
1960	0.0	28.1	55.9	0.8	18.2	6.1	90.8	1.5	9.2	0.5	0.0	1.8	212.9
1961	27.2	3.8	33.3	40.7	39.4	56.8	14.2	32.5	3.6	5.8	0.0	0.0	257.3
1962	1.3	0.0	0.0	5.9	83.2	15.4	25.9	3.0	0.8	11.2	0.0	0.0	146.7
1963	64.4	48.6	5.3	18.0	86.1	95.1	68.5	33.8	4.9	2.5	0.0	0.0	427.2
1964	0.0	0.0	111.5	9.4	0.0	64.0	57.7	34.8	10.7	1.3	0.0	0.0	289.4
1965	0.0	0.0	2.5	0.0	3.8	161.3	98.6	42.0	3.8	9.1	51.2	0.0	372.3
1966	0.0	0.0	0.0	92.2	5.5	28.4	33.3	32.8	9.1	2.8	1.0	0.0	205.1
1967	26.6	19.3	0.0	9.0	32.1	77.6	24.7	26.9	0.0	0.0	3.3	5.1	224.6
1968	10.5	21.6	36.6	63.2	12.0	90.0	5.1	4.8	1.5	4.3	0.0	0.0	249.6
1969	0.0	0.0	0.3	1.1	87.0	25.2	15.2	0.8	7.7	2.3	0.5	1.3	141.4
1970	0.0	143.7	0.0	45.8	72.1	35.3	3.8	9.1	22.2	2.8	0.0	0.0	334.8
1971	30.5	3.8	18.5	0.0	10.7	12.5	138.4	41.9	0.0	5.3	1.5		

http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_typ... 2/02/2012

Table 11 – Bureau of Meteorology Rainfall Denham



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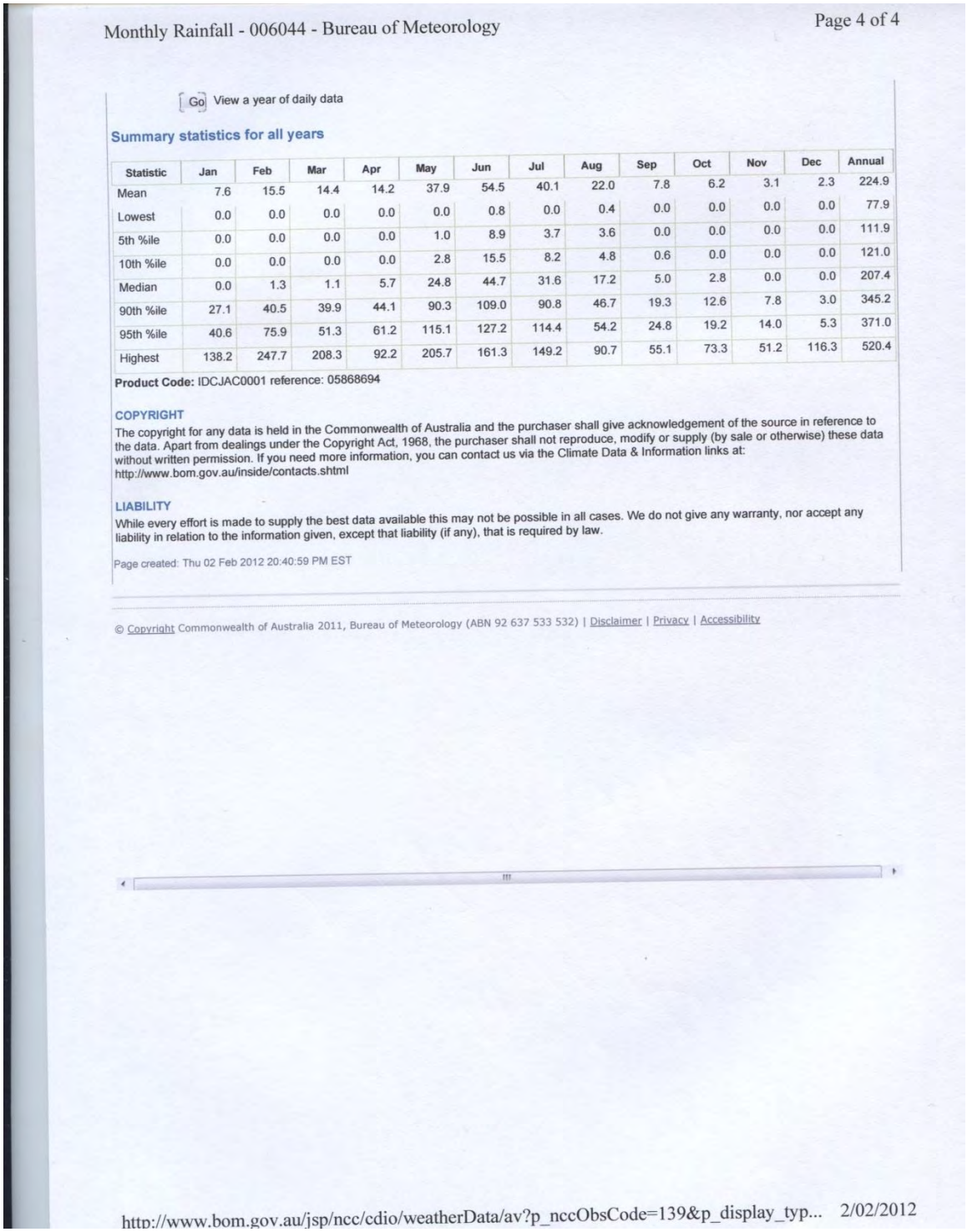
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1972	0.0	0.0	0.0		102.6	88.9	101.1	16.2	19.3	11.1	0.0	1.3	
1973	0.0							22.2				3.0	
1974	0.8	0.0	0.0	1.2	90.2	28.8	149.2	34.2	1.0	46.0	0.0	0.4	351.8
1975	0.0	64.0	16.8	43.4	41.4	80.4	42.0	7.7	7.1	38.0	35.0	0.0	375.8
1976	6.2	22.0	0.0	0.1	45.2	12.8	24.0	18.6	17.6	9.4	0.0	0.0	155.9
1977	0.0	0.0	14.0		35.0	68.0	0.0	5.0	0.0	4.0	0.0	0.0	
1978	0.0	0.0	16.0	39.0	0.0	18.0	56.0	14.0	13.0	0.0	0.0	0.0	156.0
1979	0.0	0.0	50.0	14.0	12.2	16.5	1.5	8.1	0.6	0.0	0.0	0.5	103.4
1980	1.9	0.0	0.0	13.8	60.1	32.1	31.6	6.9	2.0	19.1	0.0	0.0	167.5
1981	0.0	1.2	0.0	0.0	61.3	19.0	10.7	14.1	12.8	0.0	0.0	0.0	119.1
1982	37.2	1.0	34.4	0.0	3.5	40.4	0.8	0.4	0.8	0.6	0.0	0.0	119.1
1983	0.0	0.0	11.4	9.0	4.4	47.9	35.1	34.0	6.0	0.0	44.6	2.8	195.2
1984	0.0	20.5	22.8	31.4	84.0	28.6	34.8	23.8	11.2	73.3	1.8	0.0	332.2
1985	0.0	0.9	0.8	0.0	1.8	30.8	43.4	29.8	7.4	0.4	12.6	0.0	127.9
1986	0.0	76.4	0.2	0.0	11.6	89.8	29.2	8.2	18.6	9.8	0.0	0.0	243.8
1987	0.0	0.0	4.0	58.0	0.0	37.4	15.1	8.2	2.8	0.0		0.0	
1988	0.0	0.0	7.0	2.6	30.6	25.0	27.6	13.8	2.8	0.4	1.4	0.0	111.2
1989	0.4	2.2	0.0	14.4	91.4	55.2	16.0	1.4	5.2	7.2	2.8	0.2	196.4
1990	35.5	5.8	21.6	25.4	21.3	24.8	10.8	42.4	9.2	2.2	0.0	0.0	199.0
1991	0.0	24.2	2.6	52.6	26.0	83.6	84.2	7.8	7.8	3.6	2.4	5.6	300.4
1992	0.0	0.0	0.0	55.0	13.8	83.8	3.6	70.9	16.0	1.4	1.4	0.0	245.9
1993	0.0	11.2	0.0	17.3	28.2	26.6	16.8	38.4	21.8	0.0	18.4	0.0	178.7
1994	0.0	26.7	1.7	0.4	16.8	56.6	*32.1*	72.8	0.0	2.1	0.4	0.0	*209.6*
1995	0.0	1.2	0.0	16.2	19.5	34.5	47.7	8.8	8.2	0.8	2.8	31.3	171.0
1996	0.0	8.0	0.0	26.8	27.2	66.7	131.4	23.1	9.8	6.5	1.0	0.8	301.3
1997	0.0	8.0	0.0	15.4	32.7	42.4	22.6	47.2	18.2	2.0	0.0	0.0	188.5
1998	0.0	0.0	0.0	6.4	50.0	41.0	121.2	17.2	5.0	5.0	0.0	0.2	246.0
1999	0.8	1.6	30.2	23.3	136.2	18.8	33.6	7.0	4.0	2.4	0.0	0.0	257.9
2000	0.0	0.4	208.3	12.2	62.1	7.8	35.0	31.3	9.2	0.0	8.4	0.4	375.1
2001	0.0	68.0	0.0	9.8	11.2	4.4	32.8	30.8	8.4	11.2	0.0	0.0	176.6
2002	0.0	0.0	0.0	6.0	46.5	48.0	42.1	13.8	4.2	1.6	0.0	0.0	162.2
2003	0.0	0.0	0.4	1.6	19.5	45.7	26.9	27.8	4.4	0.6	2.4	0.0	129.3
2004	1.2	75.4	0.0	0.0	20.4	31.3	74.1	6.4	16.4	0.0	0.0	0.0	225.2
2005	0.0	0.0	2.2	13.0	89.1	120.5	6.0	13.1	14.6	6.8	0.0	0.5	265.8
2006	8.8	9.0	11.7	8.2	24.2	0.8	8.2	7.8	5.0	1.2	0.0	0.0	84.9
2007	1.7	1.8	0.0	0.0	8.8	54.6	22.6	4.3	6.8	13.4	0.0	0.0	114.0
2008	2.0	37.8	163.3	87.1	1.6	28.2	13.9	11.0	2.6	4.8	2.0	3.0	357.3
2009	0.0	24.0	0.1	0.0	3.3	31.8	50.8	17.2	3.6	16.0	13.0	0.0	159.8
2010	0.4	0.0	0.0	4.3	13.6	35.2	5.6	48.2	6.6	0.0	0.8	116.3	231.0
2011	65.6	90.0	0.0	0.0	19.4	75.8	46.8	*24.0*	*2.0*	*12.6*	*2.2*	*1.2*	*339.6*
2012	*3.8*												

http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_typ... 2/02/2012

Table 12 Bureau of Meteorology Monthly Rainfall Denham



Monthly Rainfall - 006044 - Bureau of Meteorology

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Go View a year of daily data

Summary statistics for all years

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	7.6	15.5	14.4	14.2	37.9	54.5	40.1	22.0	7.8	6.2	3.1	2.3	224.9
Lowest	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.4	0.0	0.0	0.0	0.0	77.9
5th %ile	0.0	0.0	0.0	0.0	1.0	8.9	3.7	3.6	0.0	0.0	0.0	0.0	111.9
10th %ile	0.0	0.0	0.0	0.0	2.8	15.5	8.2	4.8	0.6	0.0	0.0	0.0	121.0
Median	0.0	1.3	1.1	5.7	24.8	44.7	31.6	17.2	5.0	2.8	0.0	0.0	207.4
90th %ile	27.1	40.5	39.9	44.1	90.3	109.0	90.8	46.7	19.3	12.6	7.8	3.0	345.2
95th %ile	40.6	75.9	51.3	61.2	115.1	127.2	114.4	54.2	24.8	19.2	14.0	5.3	371.0
Highest	138.2	247.7	208.3	92.2	205.7	161.3	149.2	90.7	55.1	73.3	51.2	116.3	520.4

Product Code: IDCJAC0001 reference: 05868694

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Table 13 – Bureau of Meteorology Monthly Rainfall Denham

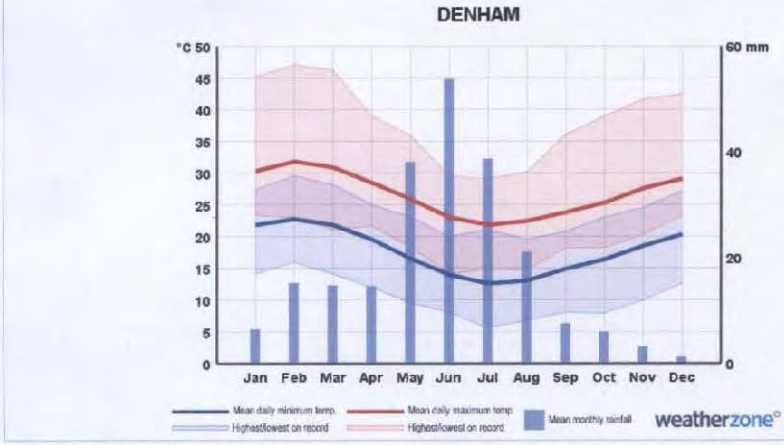
Denham Daily Records

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
High Max (°C)	45.1	47.0	46.2	38.8	36.5	29.5	29.0	30.0	36.0	38.9	41.5	42.4	**47.0**
Low Max (°C)	23.2	23.0	21.0	21.6	18.2	14.0	14.7	14.6	18.1	18.1	20.3	21.0	**14.0**
High Min (°C)	28.0	29.4	28.1	25.5	23.0	20.0	21.0	19.5	21.2	23.0	24.5	27.4	**29.4**
Low Min (°C)	14.0	15.9	14.0	11.9	9.4	8.0	5.5	6.7	8.0	7.8	10.0	12.5	**5.5**
High Rain (mm)	132.1	182.4	111.5	58.7	114.3	96.5	72.1	50.8	37.5	48.6	44.4	31.3	**182.4**

Denham Monthly Records

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
High Mn. Max (°C)	33.9	35.1	33.7	30.7	27.6	24.1	23.2	24.0	25.1	28.1	29.2	31.6	**27.8**
Low Mn. Max (°C)	28.4	29.5	28.0	26.0	23.4	21.2	19.8	19.5	21.8	23.0	24.9	26.4	**25.4**
High Mn. Min (°C)	25.2	26.4	24.5	22.0	18.8	15.5	15.0	15.0	16.4	18.4	21.1	22.5	**19.5**
Low Mn. Min (°C)	19.7	20.5	20.2	16.4	14.0	12.4	10.9	11.9	13.0	14.3	16.8	18.6	**15.7**
High Rain (mm)	138.2	247.7	208.3	87.5	205.7	161.3	149.2	88.7	55.1	73.3	51.2	116.3	**520.4**
Low Rain (mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	**77.9**

Denham Annual Temperatures & Rainfall



Denham Average Number of Days With Temperatures

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
≥ 40°C	1.0	1.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	**3.8**
≥ 35°C	3.3	6.0	5.8	1.5	0.2	0.0	0.0	0.0	0.0	0.5	2.2	3.0	**21.2**
≥ 30°C	13.8	17.6	16.7	7.2	3.0	0.0	0.0	0.0	1.2	2.7	5.7	9.6	**77.5**
≤ 2°C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
≤ 0°C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Denham 'per Week' Values (14th/86th Percentiles)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
High Max	33.4	36.7	36.0	31.8	29.0	25.4	24.0	25.0	25.9	27.9	31.0	32.7	**31.4**
Low Max	27.0	27.6	27.0	25.1	22.8	20.5	19.6	20.0	21.5	22.6	24.1	25.5	**21.8**

http://www.weatherzone.com.au/climate/station.jsp?lt=site&lc=6044 2/02/2012

Table 14` - Weatherzone Temperature and Rainfall Denham

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Aerial photo showing Lot 304 and access track