

## Chapter 4: The Physical Environment

### 4.1 Terrestrial Environment

#### 4.1.1 Geomorphology

##### 4.1.1.1 Geology

The Site is situated on a zone formed by the latest volcanic activity.<sup>1</sup> The Site has been projected on the geological map referred to in the foregoing, in Figure 4.1.1.2.1.

The basalt flows are sound.

##### 4.1.1.2 Pedology

The soils covering the site are expected to be very shallow and belong to Regosols Soil Group in the C Family (Coral Sand).<sup>2</sup>

The Site has been projected on the pedological map referred to in the foregoing, in Figure 4.1.1.2.2.



Figure 4.1.1.2.1

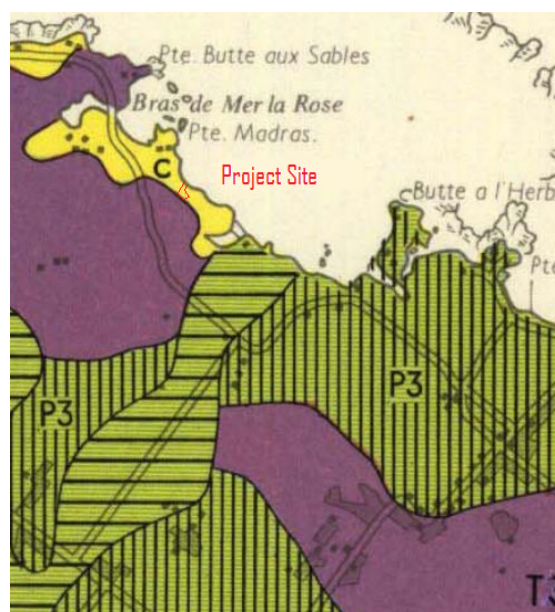


Figure 4.1.1.2.2

1. WATER RESOURCES UNIT: Hydrological Data Book. 2000–2005

2. PARISH & FEILLAFFE: Soil Map Of Mauritius. 1962

#### 4.1.2 Climatology

Of particular interest to the project, not only from the hotel operation point of view, but also from the designer's point of view, data pertaining to climatic conditions prevailing on the island will include:

- Rainfall
- Temperature
- Humidity
- Wind
- Sunshine
- Evaporation

There is no weather station on site. The nearest one is at Pamplémousses and is therefore the most representative of the climate prevailing on site. It's data is given below in Fig 4.1.2.1 & Fig 4.1.2.2 as a probable climate prevailing on site.

### Mauritius Meteorological Services

Region: North

Station: Pamplémousses

MONTH	TEMPERATURE				HUMIDITY %	WIND		SUNSHINE		RAINFALL LTM 1971-2000	NO OF DAYS WITH RAINFALL > 1 MM	NO OF DAYS WITH RAINFALL > 5 MM
	Mean Max 1971-2000	Highest Max Recorded	Mean Min 1971-2000	Lowest Min Recorded		Mean Wind Speed Km/h	Highest Gust Km/h	Daily Hrs per day	Mean Monthly			
	January	31.1	35.2	22.1	16.1	82	10.4	159	8.1	250.2	206.2	16
February	30.8	35.5	22.2	16.3	84	11.9	238	7.7	216.9	239.9	16	9
March	30.6	34.0	21.7	14.5	83	10.4	134	7.6	235.5	158.9	15	7
April	29.8	33.6	20.8	13.1	84	9.6	89	7.4	223.3	157.6	15	6
May	28.1	32.0	18.6	11.0	83	9.3	72	7.6	235.9	99.2	12	5
June	26.5	30.0	16.7	9.2	82	9.3	72	7.4	223.0	68.1	12	4
July	25.7	29.0	16.1	9.0	82	11.3	70	7.6	236.8	72.9	14	5
August	25.9	29.9	16.2	10.0	80	13.3	78	7.7	237.7	75.1	13	4
September	27.0	30.5	16.6	10.7	78	12.2	72	7.5	225.0	46.0	9	2
October	28.4	32.5	17.7	12.0	77	11.9	69	8.2	255.2	47.9	8	2
November	30.0	35.0	19.1	12.9	78	12.2	105	8.7	260.9	49.5	8	2
December	30.7	35.4	20.9	15.0	80	10.7	201	8.0	248.8	127.5	10	5

Note: LTM = long term mean

Temperature is measured in degrees celsius

Rainfall is measured in millimetres

Figure 4.1.2.1

**METEOROLOGICAL SUMMARIES**

May 2008

*Monthly Data from Agrometeorological Stations*

STATIONS	TEMPERATURE (°C)										RELATIVE HUMIDITY (%)			EVAPORATION (mm)				BRIGHT SUNSHINE (Hrs)				MEAN SOIL TEMP (°C)					
	Mean Maximum	Departure from Normal	Mean Minimum	Departure from Normal	Mean Temperature	Departure from Normal	Highest Maximum	Date	Lowest Minimum	Date	Mean Relative Humidity (AM)	Mean Relative Humidity (PM)	Lowest Relative Humidity	Date	Total Evaporation	Number of days	Departure from Normal	Daily Max. Evaporation	Date	Total Sunshine	Departure from Normal	Mean Daily	Daily Maximum	Date	Depth 30cm	Depth 50cm	Depth 100cm
<b>Pamplemousses</b>	28.7	0.6	18.4	-0.2	23.6	0.2	31.5	1	14.0	23	80	77	57	27	96	31	-11	4.7	16	216	-20	7.0	10.5	25 & 27	25.3	25.3	
<b>Reduit</b>	25.2	0.2	16.8	-1.1	21.0	-0.4	28.5	13	14.0	23	84	74	60	22	105	30	0	5.2	6	213	-10	6.9	9.8	5	24.1	22.9	24.9
<b>Belle Rive</b>	25.3	0.7	16.6	0.1	21.0	0.4	28.0	1 & 3	12.0	27	88	78	54	26	97	30	2	9.5	26	194	-9	6.3	9.9	13 & 25	23.3	23.3	23.9
<b>Union Park</b>	24.7	0.4	17.8	0.2	21.3	0.3	28.2	1	13.7	27	84	80	56	22	79	28	-8	4.3	14	163	2	5.3	10.4	22	21.5	22.3	23.8
<b>La Baraque</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Often

- Data not available

Figure 4.1.2.2

**4.1.2.1 Rainfall Regime**

The comparative low annual rainfall for Anse La Raie and its surroundings arises from the prevailing pattern of the south eastern trade winds.

These winds rise over the island and cause precipitation mainly on the higher Central plateau and its eastern slopes. When the winds reach the lower regions, and the north western coast, they have already dropped most of their moisture.

Average monthly rainfalls for the northern region, i.e Pamplemousses for the period 1997-2003 are reported in Table 4.1.2.1 above (source: Mauritius Meteorological Services)

September to November are the driest months. January and February are above 200mm monthly rainfall. In the past year, March has been a month of heavy rainfall with occasional flooding around the inland.

Seasonal rain variations should cause no effect to and from the proposed project due to the type of low rise development involved.

**4.1.2.2 Temperatures**

Mean maximum and mean minimum temperatures for the northern region, i.e Pamplemousses for the period 1997-2003 are reported in Table 4.1.2.1 above (source: Mauritius Meteorological Services).

Mean minimum temperatures are recorded during the winter season in July and Mean maximum temperatures are recorded during the summer season from November to March.

Seasonal temperature variations should cause no effect to and from the proposed project due to the type of low rise development involved.

#### ***4.1.2.3 Wind Regime***

Mauritius is situated in the equator-ward belt of the southern sub-tropical anticyclone system. Atmospheric pressures at the surface increase southward in this belt, creating a gradient, which maintains a general easterly flow.

The prevailing wind pattern in Mauritius is the South Eastern Trade Winds except for short periods in the summer months when tropical storms approach the island. The trade winds are stronger and more persistent in winter when strong anticyclones pass to the South and close to the island.

Anse La Raie is partly under the influence of the prevailing winds as located in the northern coastal plains.

Mean wind speeds for the northern region, i.e Pamplemousses for the period 1997-2003 are reported in Table 4.1.2.1 above (source: Mauritius Meteorological Services).

The wind speed increases in winter with strong south eastern trade winds and anti cyclones.

Wind variations should cause no effect to and from the proposed project due to the type of low rise development involved.

#### ***4.1.2.4 Surface Evaporation***

The free surface evaporation data, i.e Pamplemousses for the period 1997-2003 are reported in Table 4.1.2.2 above (source: Mauritius Meteorological Services).

Data shows that Soil Moisture Deficits will exist on the Project site and that irrigation will be indispensable for the successful maintenance of landscaped areas.

#### ***4.1.2.5 Cyclones and Natural Catastrophes***

##### ***4.1.2.5.1 Cyclones***

Mauritius is subjected to possible seasonal tropical cyclones in the month of December to March/April. Cyclones are characterised by low pressure conditions and high wind systems. From records available at the Mauritius Meteorological Services over the period 1960-70, 30% of cyclones were classified as weak, 42% as moderate, and 19% as Strong with gust speeds over 80 km/h.

Since cyclone Dina in 2001, Mauritius has not been subject to strong cyclones.

Elevations in sea levels caused by cyclones do not exceed 2.00m, however high wind systems over the sea can contribute to formation of occasional waves exceeding this value.

Given that the site has a small sea frontage and the terrain quickly **elevates to +2.50m amsl**, there should be no flooding effect due to sea level rise due to cyclonic conditions.

#### 4.1.2.5.2 Natural Catastrophes

Mauritius is not subjected to earthquakes, nor has the island been affected by the Tsunami in December 2004. Elevations in sea levels which has been recorded from North to East of the island generally not exceeded 2.00m.

### 4.1.2.6 Terrestrial Biodiversity

#### 4.1.2.6.1 Site Biodiversity

The site is characterised by Alien Vegetation, mainly constituted by:

- Casuarina equisetifolia(filaos)
- Pithecellobium dulce(Cassie de Manille)
- Flacourta indica(Prune Malgache)
- Furcraea foetida(aloes)
- And generally high degraded low shrub and grassy vegetation

The site contains no indigenous or endangered species, no rare fauna and flora that are protected by law.

#### 4.1.2.6.2 Surrounding Biodiversity

The site is not located within an existing or proposed Environmental Sensitive Area, according to the National Development Strategy Plan and Moka/Flacq Outline Planning Scheme.

It is however located next to the declared wetlands no 82 and further west on the other side if the road wetland no 81 as shown in Fig. 4.1.2.6.2 below- according to the Environmental Sensitive Areas – Classification Report of the Ministry of Environment & NDU(2009).

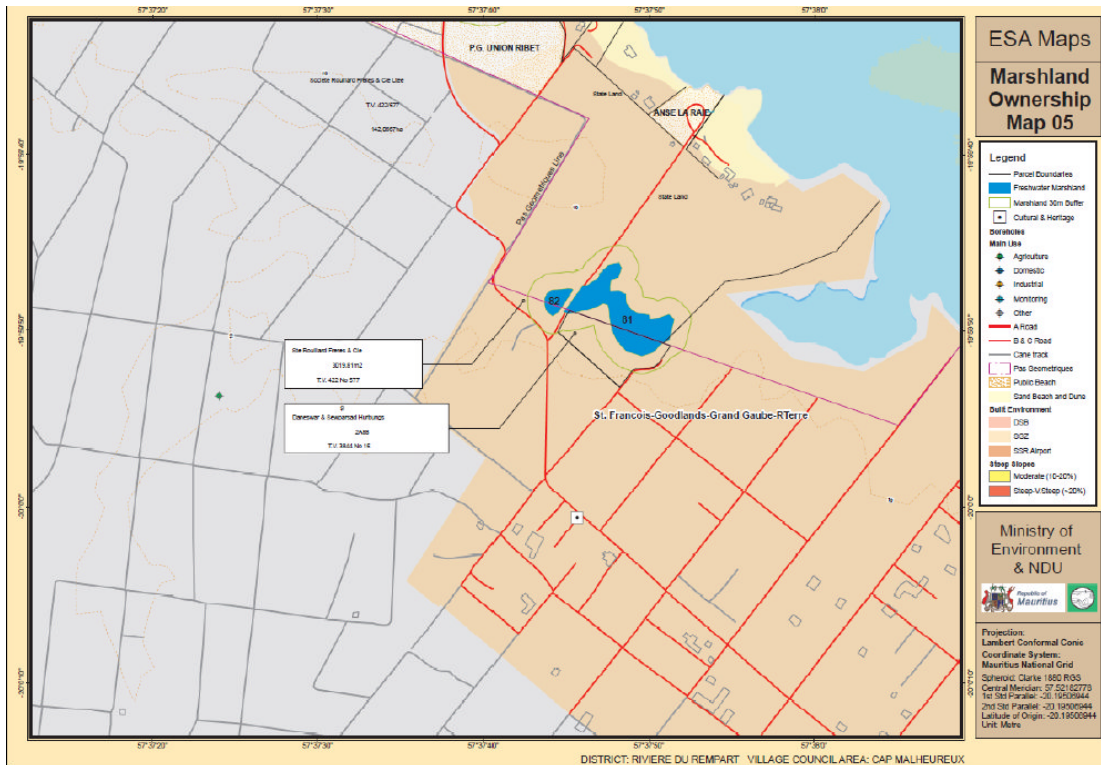


Figure 4.1.2.6.2

## 4.2 Marine Environment

Coastal improvement is not intended.

## 4.3 Air Quality and Noise

### 4.3.1 Air Quality

Existing air quality within the area is expected to reflect its coastal character free from any atmospheric pollutant. There is little published data on ambient air quality in Mauritius and none in the northern coastal area.

Mauritius having a moderate tropical climate with South East Trade Winds prevailing through most of the year and the site being located in the northern coast and with no nearby source of trans-boundary air pollution, the natural background dust level is extremely low.

### 4.3.2 Noise

Noise is probably the most common form of pollution experienced by the majority of the population, and is unfortunately an inevitable by-product of the whole process of industrialisation and urbanisation.

There is little published date on ambient noise quality in Mauritius and none in the northern coastal area as it is neither industrialised nor urbanised. Noise levels in the area are however characteristic of the background natural noise due to wind and waves.