the dme
Department:
Minerals and Energy
REPUBLIC OF SOUTH AFRICA

DME 12

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Enquiries: D.A. Watkins
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Reference: EC30/5/1/2/3/2/1(0243)EM
Date: 18 December 2009

South African Heritage Resources Agency
P.O. Box 758
GRAHAMSTOWN
6140

ATTENTION: MR. T. LUNGILE

Already on SAHRIS
CaseID: 2454

Sir

CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002: EMP FOR SAND MINING ON REMAINDER OF ERF 1948, WALMER, DIVISION OF PORT ELIZABETH

1. Attached herewith, please find a copy of the EMP received from Inzulu Mining Company (Pty) Ltd.

2. Please forward any written comments or requirements your department may have in this regard, to this office no later than **16 February 2010**. Failure to do so, will lead to the assumption that your department has no objection(s) or comments with regard to the said documents.

3. Consultation in this regard has also been initiated with other relevant State Departments.

4. Please use the reference numbers as indicated in all future correspondence.

5. Your co-operation is appreciated.

Yours faithfully

REGIONAL MANAGER
EASTERN CAPE

ENVIRONMENTAL MANAGEMENT PROGRAMME

INZULU MINING CO (PTY) LTD

SUBMITTED IN SUPPORT OF AN APPLICATION FOR A MINING RIGHT FOR SAND IN TERMS OF SECTION 22 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002), COVERING A PORTION OF THE REMAINING EXTENT OF ERF 1948, MAGISTERIAL DISTRICT OF PORT ELIZABETH.

DMR Reference Number: (EC) 30/5/1/2/5/2(0243) SP

EASTERN CAPE

DECEMBER 2009

Future Mining Consultants

Contact details for the consultant are as follows:
Future Mining Consultants:
Postal Address: PO Box 53287, Wierda Park, 0149
Tel: 083 575 7671
Fax: 086 691 2411
E-mail: futuremining@gmail.com

Please contact the above consultant with regards to all correspondence regarding this document.

CONTENTS:

Tables and Figures

WORD DEFINITIONS:

In this document, unless otherwise indicated, the following words will have the meanings as indicated herein:

Word:	Definition:
Act (The Act)	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
ARC – AGIS	Agricultural Research Council's Agricultural Geo-referenced Information System
ARC – ISCW	Agricultural Research Council Institute for Soil, Climate and Water
Archaeological	Material remains resulting from human activities which are in a state of disuse and are in, or on, land and which are older than 60 years, including artefacts, human and hominid remains, and artificial features and structure
Authority	National, regional or local authority, which has decision-making role or interest in the development
Best Practicable Environmental Option (BPEO)	BPEO is the outcome of a systematic consultative and decision-making procedure that emphasizes the protection of the environment across land, air and water. It establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole at an acceptable cost in the long term and as well as the short term.
BID	Background Information Document
Biodiversity	This refers to both the variety of different species of plants and animals, as well as genetic variability within species, which is essential in maintaining life-sustaining ecosystems.
Biome	A complex of communities of very wide extent, characterised by distinctive vegetation and climate
Borehole	A hole drilled for the purposes of prospecting i.e. extracting a sample of soil or rock chips by pneumatic, reverse air circulation percussion drilling, or any other type of probe entering the surface of the soil.
CARA	The Conservation of Agricultural Resources Act, 1989
Cultural resources	The physical elements of both the built and natural environment, which are integral to a sense of shared identity.
DEAT	Department of Environmental Affairs and Tourism
Development	This is a broad term which refers to actions taken by individuals, communities, industry or government aimed at improving quality of life and fulfilling human potential. Measures of development include average income per person and reduced levels of poverty, unemployment and child morality.

Word:	Definition:
Disturbance	Any event or series of events that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.
DME	Department of Minerals and Energy
DWAF	The Department of Water Affairs and Forestry – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
EAP	Environmental Assessment Practitioner
EIA	An Environmental Impact Assessment as contemplated in Section 38(1) (b)of the Act
EMP	An Environmental Management Plan as contemplated in Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).
Endemic species	Species with a distribution restricted to specific geographical areas. Endemism may occur on local, regional, sub continental or continental scales. Local endemism is usually associated with particular habitat requirements.
ENPAT	Environmental Potential Atlas
Environment	The external circumstances conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical, cultural and political aspects.
Environmental impacts	The consequences of environmental aspects on environmental resources of particular value or sensitivity.
Environmental incident	◆ Any action undertaken (or omitted) by the proponent or his duly appointed representatives (e.g. contractors) that results in overly/unnecessary disturbance or damage to the environment. ◆ Any action undertaken (or omitted) by the proponent or his duly appointed representatives (e.g. contractors) that could lead to (has potential for) overly/unnecessary disturbance or damage to the environment. ◆ Non adherence to environmental legal requirements/laws (including the stipulations of authorizations issued in respect of a proposed activity e.g. those contained in a Record of Decision).
Environmental Officer	Independent environmental consultant appointed to monitor compliance with the EMP
Erosion	A process that involves the wearing away of the land surface by mechanical or chemical action.
Fauna	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Feasible	Acceptable, capable of being used or implemented successfully, without unacceptably damaging the environment.

Word:	Definition:
Fence	A physical barrier in the form of posts and barbed wire and or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
Flora	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
GOSP	Gauteng Open Surface Plan
Ground water	All subsurface water occupying voids within a geological medium.
Habitat	The natural environment of an organism. The living space occupied by an organism. Physical surroundings in which an organism is likely to be found.
House	Any residential dwelling of any type, style or description that is used as a residence by any human being.
I&AP	Interested and/or affected party
Infrastructure	Refers to permanent physical structures such as roads, storm water drains and electricity lines.
Land-use	The actual or permitted activities on a defined piece of land.
MAMSL	Meters above mean sea level
MAP	Mean Annual Precipitation
Mitigation measures	Mitigation measures encompass all actions taken to eliminate offset or reduce potentially adverse environmental impacts to acceptable levels (World Bank, 1999:1).
MPRDA Regulation	Mineral and Petroleum Resources Development Regulation in terms of Government Notice R527, published on 23 April 2004.
NDA	National Department of Agriculture
NEMA	National Environmental Management Act (Act 107 of 1998)
NWA	National Water Act, Act 36 of 1998
Pit	Any open excavation
Pollution	The introduction of substances into the environment, which can have a negative effect on human health or the quality of the environment.
"Porrel"	The term used for the sludge created at alluvial diamond diggings where the alluvial gravels are washed and the diamonds separated in a water-and-sand medium.
Project activities	Those activities or actions of a project which are likely to give rise to an impact on the environment.

Word:	Definition:
Proponent	An individual and/or organisation that is of the intention to undertake an activity identified in terms of Section 21 of the Environmental Conservation Act, 1989 (Act no. 73 of 1989). Typically a proponent, ◆ stands to benefit directly from the proposed activity (e.g. a private developer gaining financially), or ◆ is duly sanctioned in terms of its legal mandate (e.g. a government department) to undertake such activities for the attaining of its objectives.
Red data species	Species of animals and plants recognized internationally as having a high conservation value or which are being threatened through natural or unnatural causes.
Resource	Any goods, services or environmental conditions which may have the potential to enhance social well being.
Risk	The scientific judgement of probability and significance of harm to the environment.
ROD	Record of Decision
SAHRA	South African Heritage and Resource Agency
Scoping	A procedure for narrowing the scope of an assessment and ensuring that the assessment remains focused on the significant issues or impacts. Scoping requires input from authorities and the public.
Significant	Factors or considerations are termed significant when they are important, because they are of consequence. For example, they will have a detectable influence on a process, the environment, or the end result.
Species	A group of organisms with distinctive characteristics and which remain distinct by virtue of barriers to interbreeding with other kinds of organisms.
Tc (Time of concentration)	This is the time it would take for a drop of water to flow along the furthest drainage path to the exist point of a defined catchment area.
Threatened	Used to describe the status of a species or population of a species, which has deteriorated through natural or unnatural causes to the point where it may be considered as rare, vulnerable or endangered.
Topsoil	◆ The layer of soil covering the earth which- ◆ provides a suitable environment for the germination of seed; ◆ allows the penetration of water; ◆ is a source of micro-organisms, plant nutrients and in some cases seed; ◆ and is not of a depth of more than 0,5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.

Word:	Definition:
Trench	A type of excavation usually made by digging in a line towards a mechanical excavator and not pivoting the boom – a large, U-shaped hole in the ground, with vertical sides and about 6 – 8 metres in length. Also a prospecting trench.
Vegetation	Any and all forms of plants, see also Fauna
Water – "Clean Water"	Any water that originates outside of the mining area, entering the mining area through overland flow, lateral subsurface flow, or any other natural movement of water.
Water – "Clean Water System"	Any dam, other form of impoundment, canal, works, pipeline and any other structure or facility constructed for the retention or conveyance of unpolluted water.
Water – "Dirty Water"	Any water that originates within the mining area, either as a result of precipitation or as part of mineral processing, as well as untreated sewage and Grey Water.
Water – "Dirty Water System"	Any dam, other form of impoundment, canal, works, pipeline, residue deposit and any other structure or facility constructed for the retention or conveyance of water containing waste.
Water – "Grey Water"	Domestic Waste water not containing sewage

Background Information:

Introduction:

Inzulu Mining Co (Pty) Ltd (hereinafter referred to as "the Company") is a relatively small mining concern which has already secured a 35% black economic partnership. Please refer to the shareholder's certificates and shareholder's agreement, respectively, attached to the social and labour plan.

The proposed mining area, which is owned by the local authority, namely the Nelson Mandela Bay District Municipality, is situated between a refuse site and a cemetery and is currently used by unemployed HDSA's for grazing for their cattle. The Eastern Cape Provincial Department of Economic Development and Environmental Affairs (hereinafter referred to as "DEDEA" in its comments on the scoping report, which preceded this programme, was concerned regarding the horizontal distance between the existing cemetery and the proposed mining area. The existing cemetery is situated directly adjacent to the mining area. It will however be observed later in this programme that the said municipality, who is the land owner in respect of the above property, the property consisting the adjacent refuse site, as well as the existing cemetery, indicated that it has no objection to the above proposal, seeing that this particular site has in any event been earmarked for the extension of the said existing cemetery. It was from the outset during negotiations between the Company and the municipality clear that the Company, by mining and levelling the sand dunes, will be saving the municipality a great deal of money as it would have otherwise had to remove the vegetation and the sand dunes at its own cost in any event.

It should be understood that all the technical and financial ability are provided by Sunshine Coast Crushers CC.

Details of the Applicant:

Company Name:	Inzulu Mining Co (Pty) Ltd
Company Registration Number:	2003/010519/07
Contact Person:	Mr Gavin Eales
Telephone Number:	(041) 366 1165
Fax Number:	(086) 680 0563
Physical Address:	R/E of Erf 1948, Walmer
Postal Address:	P O Box 5780 Walmer 6065
Email:	inzulumining@gmail.com

Regional Setting:

The mine is situated on portion of the remaining extent of Erf 1948, Magisterial District of Port Elizabeth (hereinafter referred to as "the mining area"). See **Map 2 – Regulation 2(2) Plan** and **Map 1 – Locality Plan** attached hereto as **Annexure A.**

Nature and Extent of the Development:

This mining application is located between a cemetery and a grave yard on portion of the remaining extent of Erf 1948, Walmer. The area is approximately 26 hectares in extent. Mined materials will be screened by a dry processing mobile plant located on the mining area.

Existing Rights, Licenses and Permits:

The Company has acquired a mining licence, namely Mining Licence No 41/2001 ML, in terms of section 9 of the repealed Minerals Act, 1991, (Act 50 of 1991), in respect of the remaining extent of the farm Rietheuvel 296, Magisterial District of Uitenhage, which right expires on 1 October 2010. The Company applied in October 2008 for conversion of the said used old order mining right in terms of Item 7(2), Schedule II, of the Mineral and Petroleum Resources Development Act, 2002, hereinafter referred to as "the said Act", to a new order mining right contemplated in section 22 of the said Act, in respect of the corresponding area (which includes the plant and related activities), as shown on the plan attached to the mining work programme submitted in support of that application. The said application is still under consideration.

PART 1 – SECTION 39 (4) (a) (i) OF THE MPRDA

Chapter 1 – Description of the Existing Environment:

MPRDA Regulation 50 (a)
MPRDA Regulation 50 (a)
MPRDA Section 39 (3) (a)

1.1. Geology:

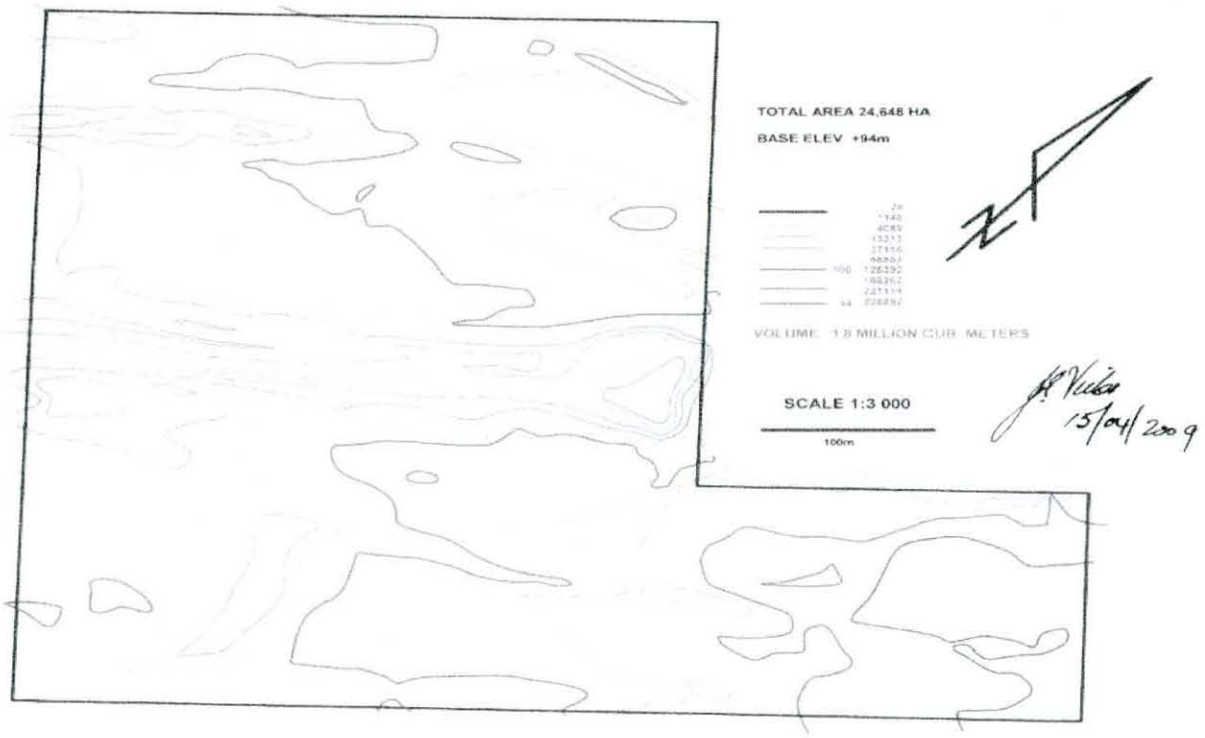
According to the 1:250 000 geological Map 3324 Port Elizabeth the geology underlying the area consists of sand, silt and clay of the Kirkwood formation and the Uitenhage Group. The Site is underlain by steeply folded quartzitic sandstones of the Peninsula Formation, Table Mountain Group, with the folds striking roughly NW-SE. This results in the strong directional pattern of rocky outcrops along the coast, interspersed with small sandy coves.

Over the greatest portion of the site the bedrock is covered to varying depths with Aeolian sand of marine origin, together with some calcrete layers. The wind has shaped the dune sands into a series of small ridges and undulations.

Other interesting features of the landscape are the coastal terraces, defined by steep scarps, which are a result of earlier rises and regressions in sea-level over geological time.

The location of the mineral deposit is shown on the **Map 3 – Geology Plan** attached hereto as **Annexure A.**

The mineral reserves on the proposed mining area are indicated to be more than 1,800,000 m³ of exploitable mineral (sand). See surveyor's plan below.



1.2 Climate:

1.2.1 Regional Climate:

Algoa Bay is situated near the junction of temperate (winter rainfall) and subtropical (summer rainfall) climatic regimes. The area experiences a warm-temperate climate with bimodal winter rainfall, generally ranging between about 400-800 mm per annum. The wind regime is vigorous and strong winds occur throughout the year. Winds blow predominantly from the west-southwest, but the proportion of winds with an easterly component increases substantially in summer, and December, and calmest conditions from March to May.

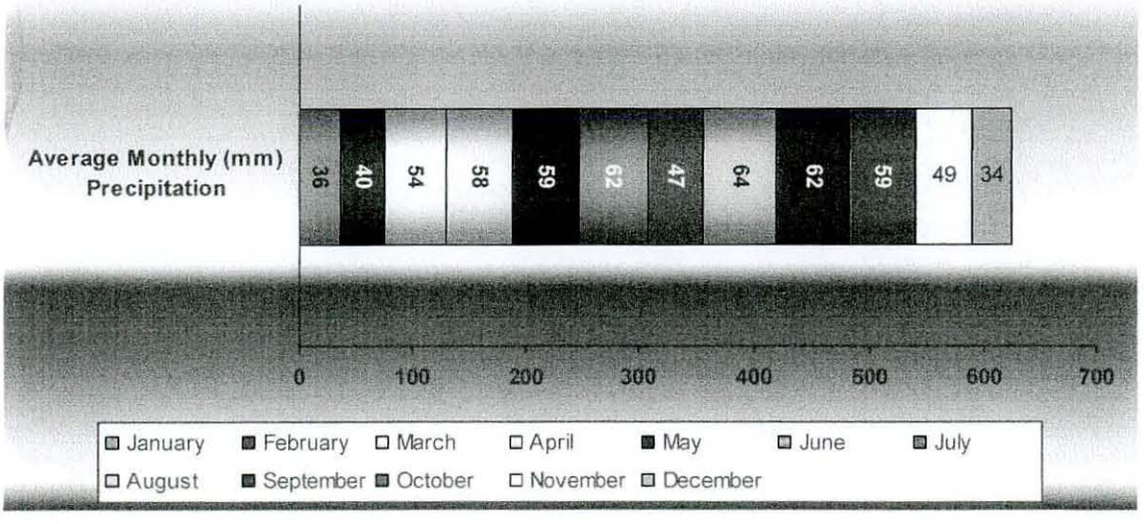
1.2.2 Mean Monthly and Annual Rainfall for the Site and Number of Days per Month with Measurable Precipitation.

Table 1.2.2: The following climatological information represents the normal values and according to World Meteorological Organization (WMO) prescripts, based on monthly averages for the 30-year period 1961 – 1990 for Port Elizabeth.

Month	Precipitation
	Average Monthly (mm)
January	36
February	40
March	54
April	58
May	59
June	62
July	47
August	64
September	62
October	59
November	49
December	34
Year	**624**

Table 1.2.2 Rainfall

The following chart indicates the monthly rainfall for the Port Elizabeth for the Period 1961 to 1990.



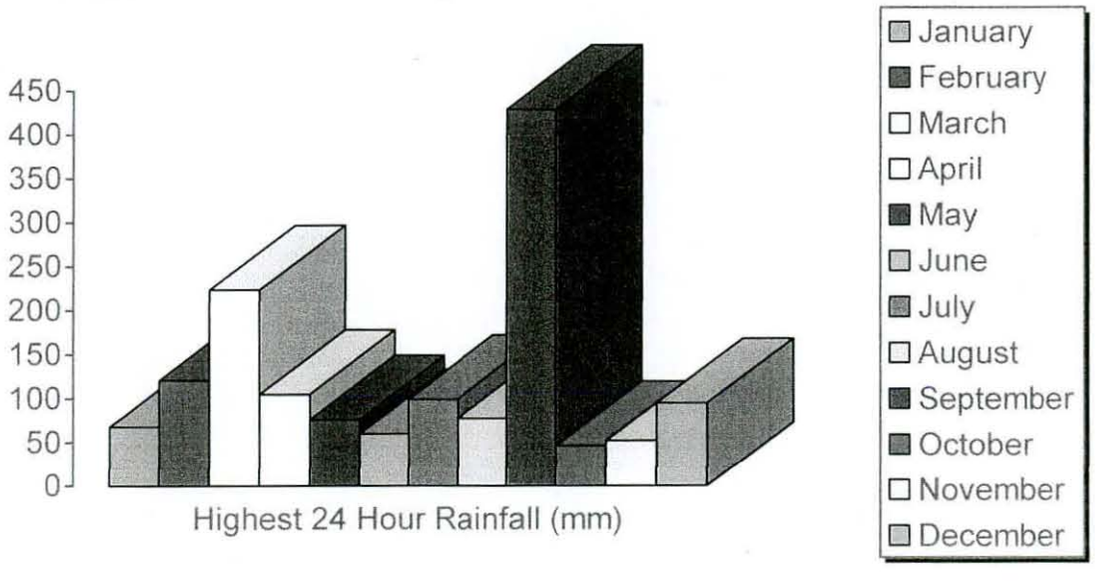
1.2.3 Rainfall Intensities

Table 1.2.3: This climatological information is the normal values and, according to World Meteorological Organization (WMO) prescripts, based on monthly averages for the 30-year period 1961 – 1990 for Port Elizabeth.

Month	Precipitation
	Highest 24 Hour Rainfall (mm)
January	68
February	121
March	224
April	105
May	76
June	60
July	99
August	77
September	429
October	46
November	52
December	95
Year	**429**

Table 1.2.3 Highest 24 Hour Rainfall

The following chart indicates the highest 24 hour rainfall (mm)



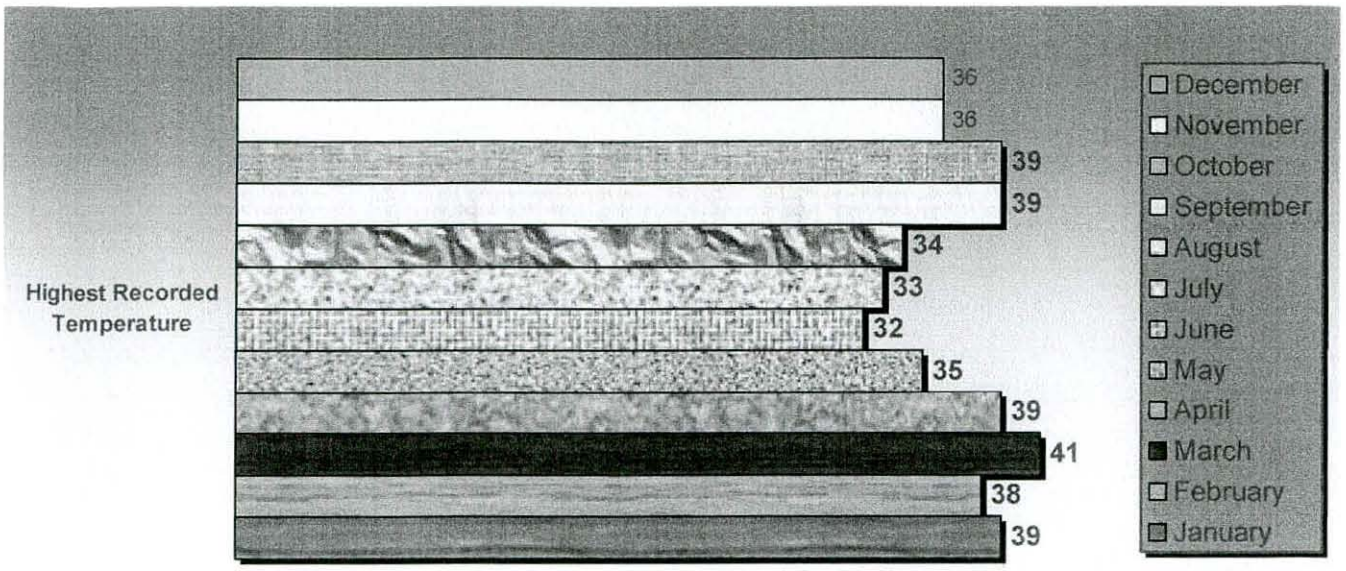
1.2.4 Mean Monthly, Maximum and Minimum Temperatures

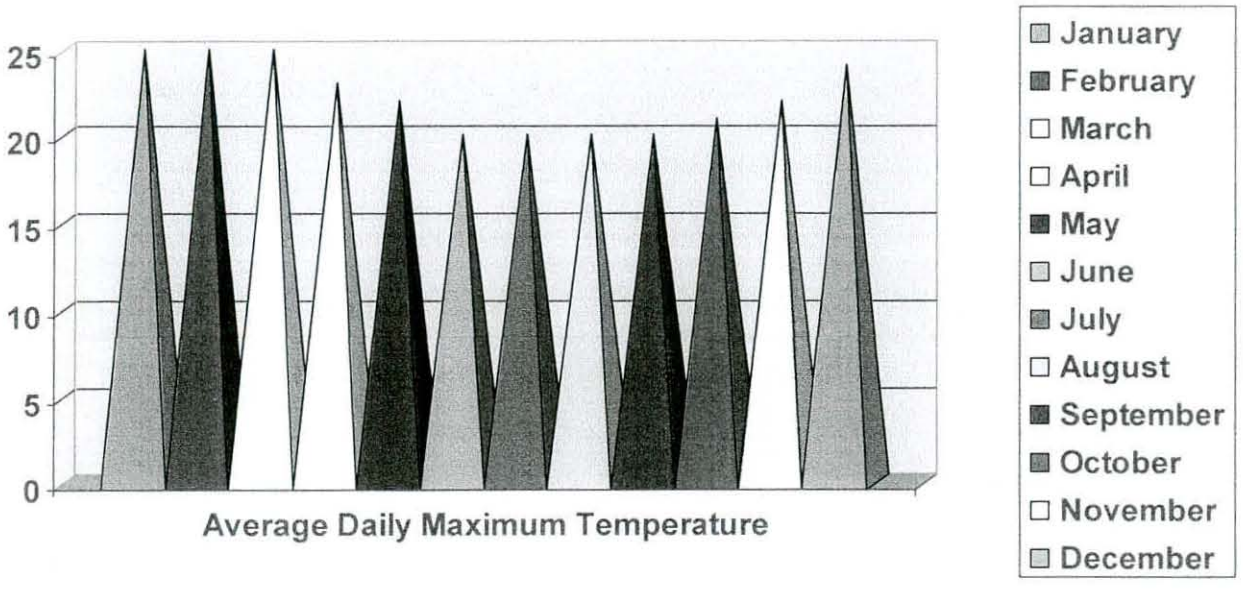
Table 1.2.4: This climatological information is the normal values and, according to World Meteorological Organization (WMO) prescripts, based on monthly averages for the 30-year period 1961 – 1990 for Port Elizabeth.

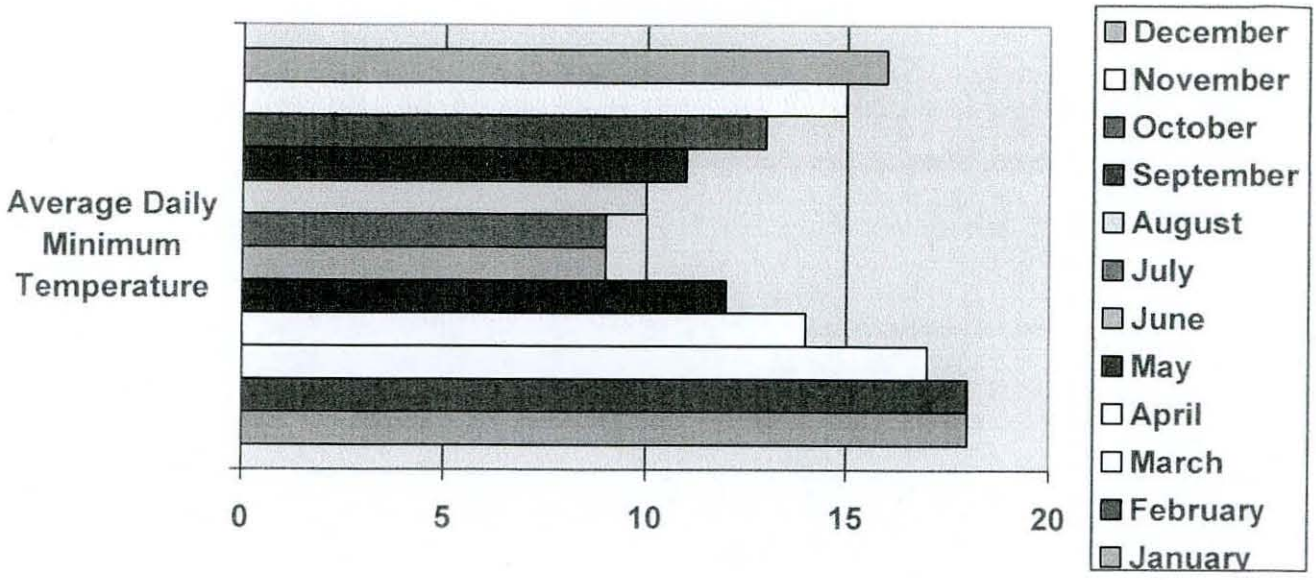
Month	Temperature (° C)			
	Highest Recorded	Average Daily Maximum	Average Daily Minimum	Lowest Recorded
January	39	25	18	10
February	38	25	18	11
March	41	25	17	8
April	39	23	14	4
May	35	22	12	2
June	32	20	9	-1
July	33	20	9	-1
August	34	20	10	2
September	39	20	11	2
October	39	21	13	3
November	36	22	15	6
December	36	24	16	9
Year	**41**	**22**	**14**	**-1**

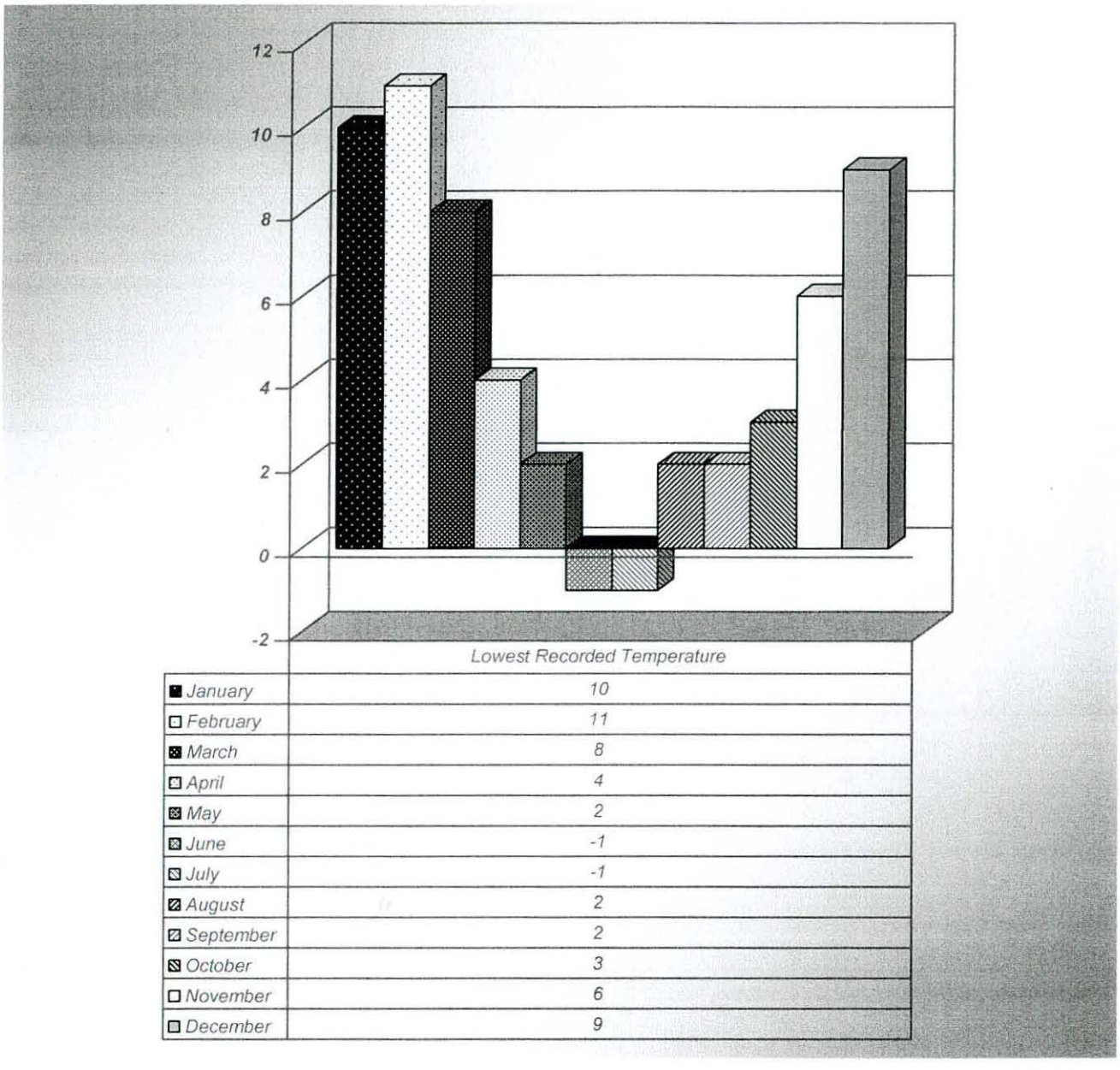
Table 1.2.4 Average Temperature

The following charts indicate the highest recorded, maximum, minimum and lowest temperatures for Port Elizabeth for the Period 1961 to 1990.


Highest Recorded Temperature
36
36
39
39
34
33
32
35
39
41
38
39
December
November
October
September
August
July
June
May
April
March
February
January


25
20
15
10
5
0
Average Daily Maximum Temperature
January
February
March
April
May
June
July
August
September
October
November
December


Average Daily Minimum Temperature
0
5
10
15
20
December
November
October
September
August
July
June
May
April
March
February
January



	Lowest Recorded Temperature
January	10
February	11
March	8
April	4
May	2
June	-1
July	-1
August	2
September	2
October	3
November	6
December	9

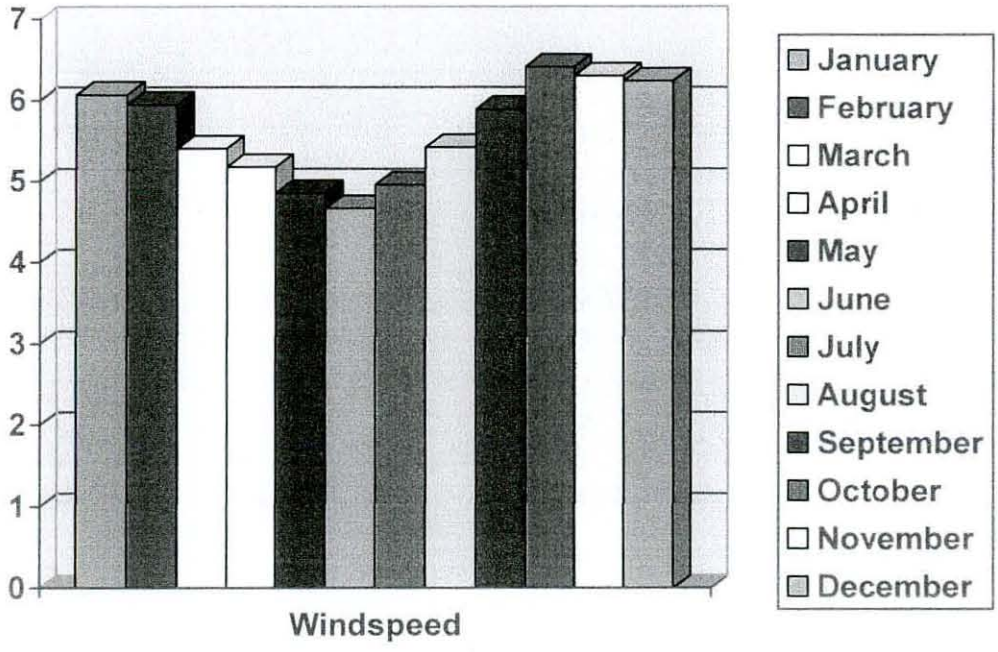
1.2.5 Wind Direction and Speed:

Table 1.2.6: This climatological information is the normal values and, according to World Meteorological Organization (WMO) prescripts, based on monthly averages for the 30-year period 1961 – 1990 for Port Elizabeth.

Month	*Speed*	*Direction*
January	6.07	WSW
February	5.95	WSW
March	5.41	WSW
April	5.18	WSW
May	4.86	WSW
June	4.67	WSW
July	4.96	WSW
August	5.42	WSW
September	5.89	WSW
October	6.41	WSW
November	6.3	WSW
December	6.24	WSW
Year	**5.63**	**WSW**

Table 1.2.5 Wind Direction and Speed

The following chart indicates the months and speed of the wind:



1.2.6 Evaporation:

No information.

1.2.7 Extreme Weather Conditions

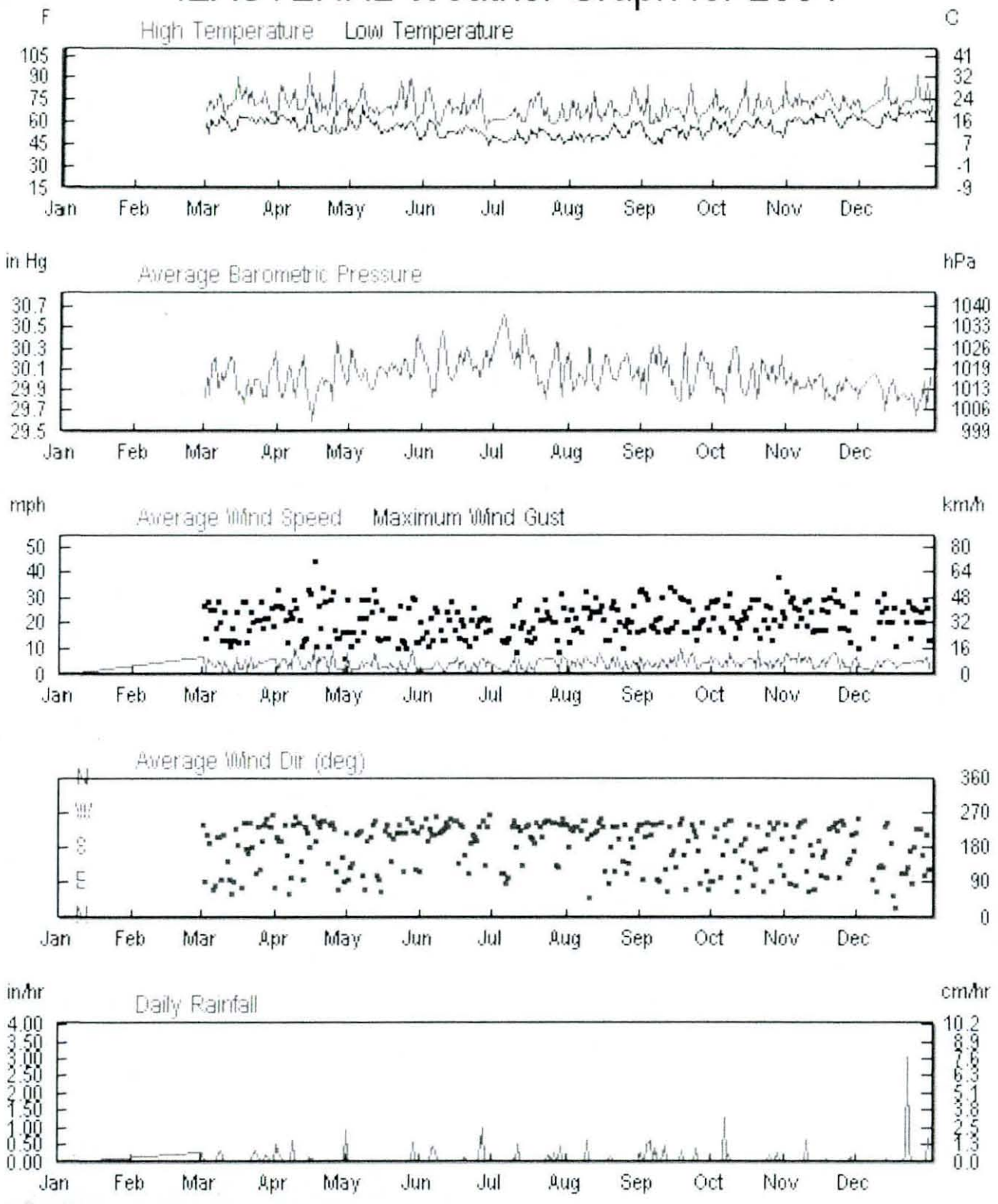
According to the Port Elizabeth Weather Bureau, extreme weather conditions from the point of view of strong to gale force winds can be expected for large parts of the year at a 3-4 day interval.

As DEDEA in its comments to the said scoping report requests that more recent weather data be included in this programme, the following recently updated weather graphs are also included.

Custom Summary for January 1, 2004 - September 7, 2009

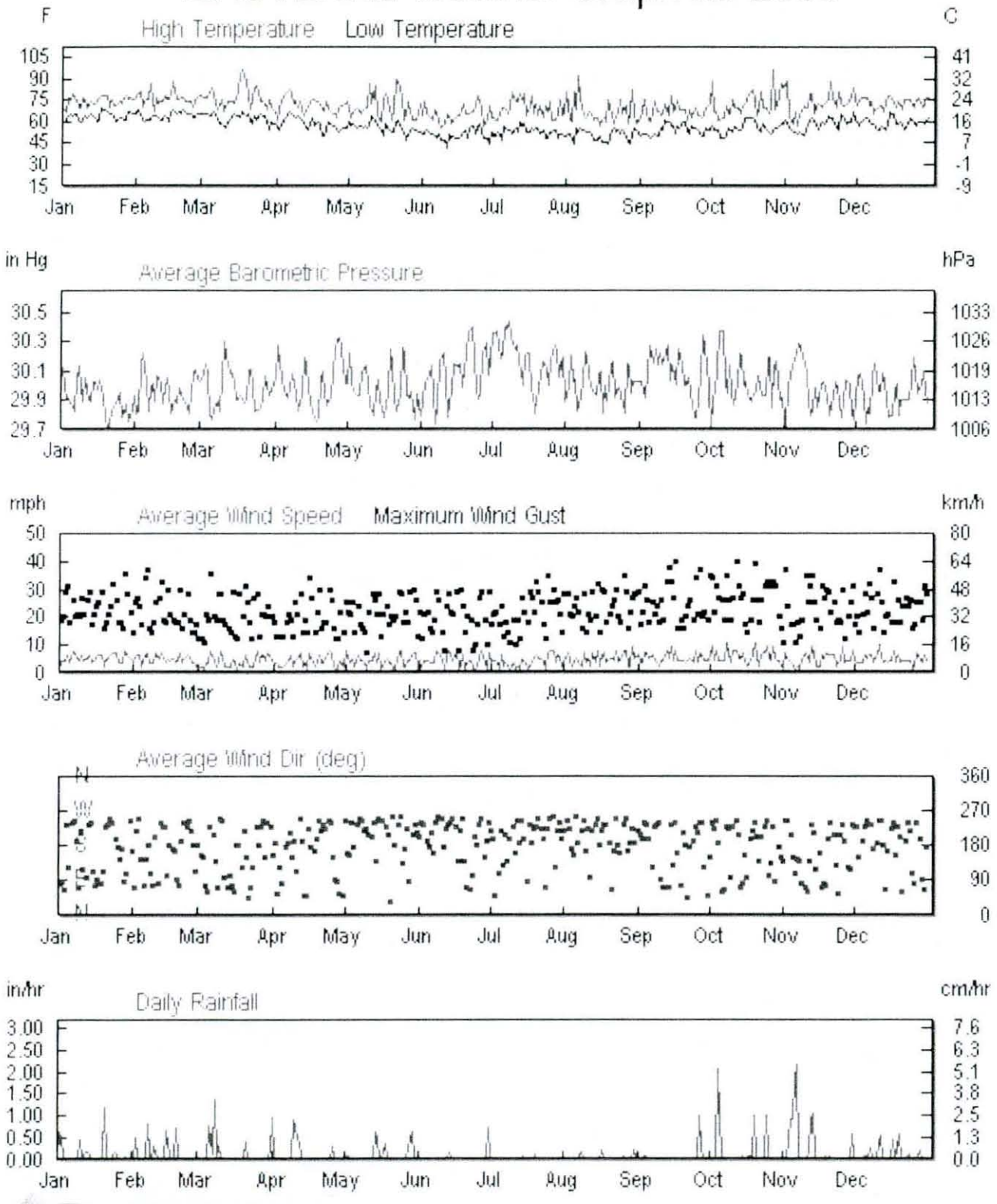
	High:	Low:	Average:
Temperature:	38.1 °C	5.2 °C	17.8 °C
Dew Point:	26.7 °C	-73.3 °C	12.2 °C
Humidity:	100.0%	1.0%	73.6%
Wind Speed:	29.0km/h from the SW	-	6.6km/h
Wind Gust:	70.8km/h from the West	-	-
Wind:	-	-	South
Pressure:	1038.5hPa	993.8hPa	-
Precipitation:	5940.8mm		

IEASTERN2 Weather Graph for 2004



Weather Underground®
wunderground.com

IEASTERN2 Weather Graph for 2005



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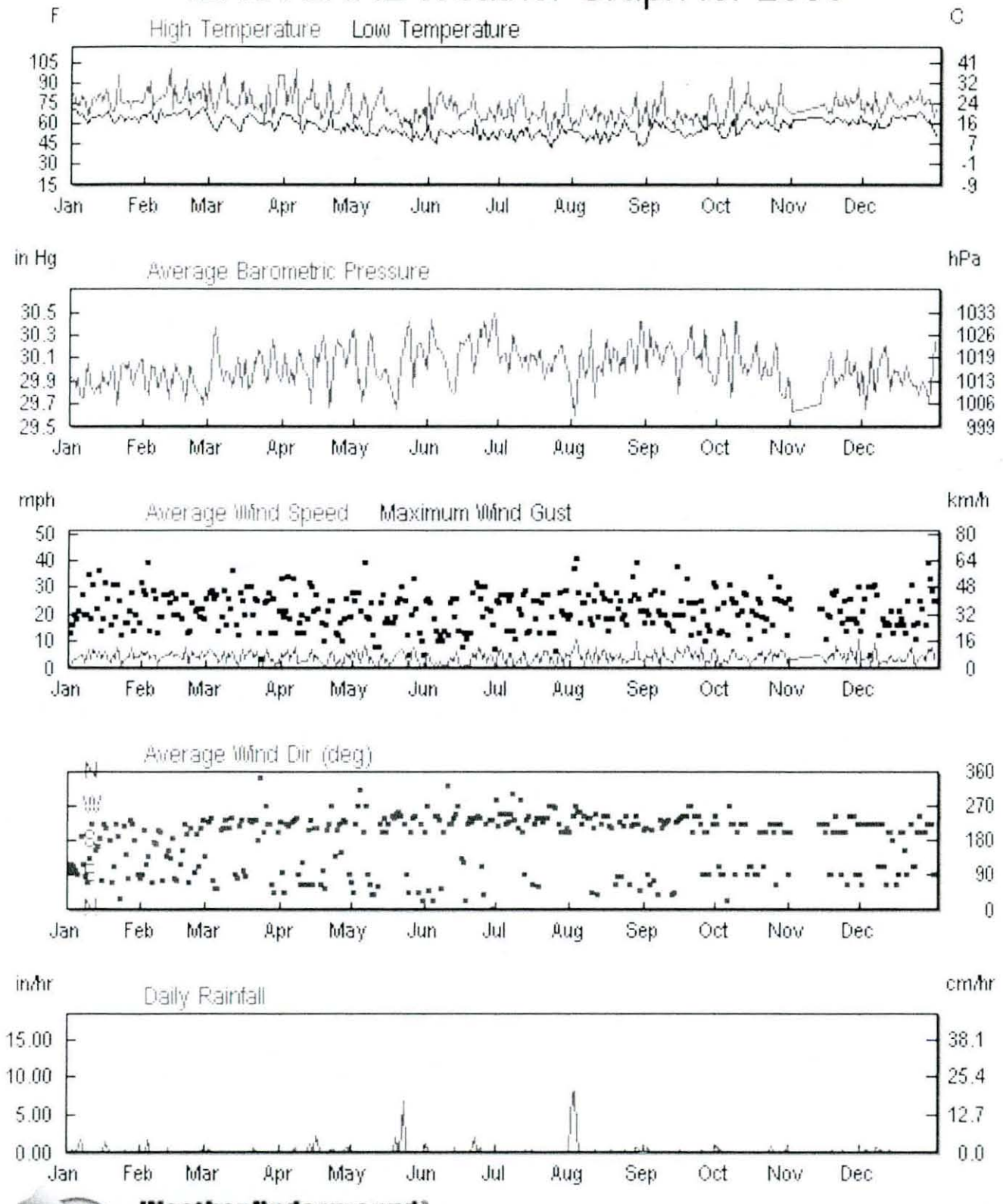
IEASTERN2 Weather Graph for 2006



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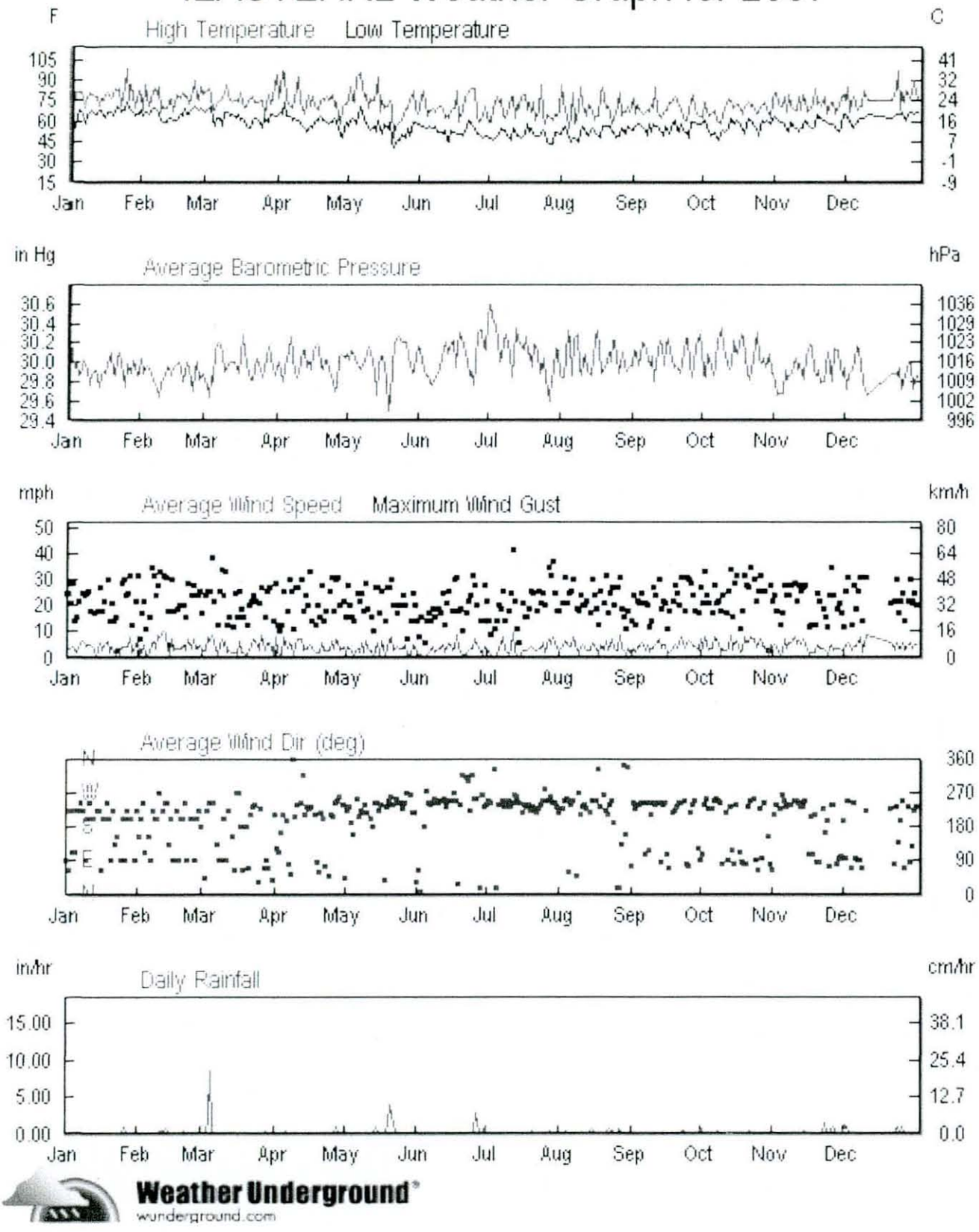
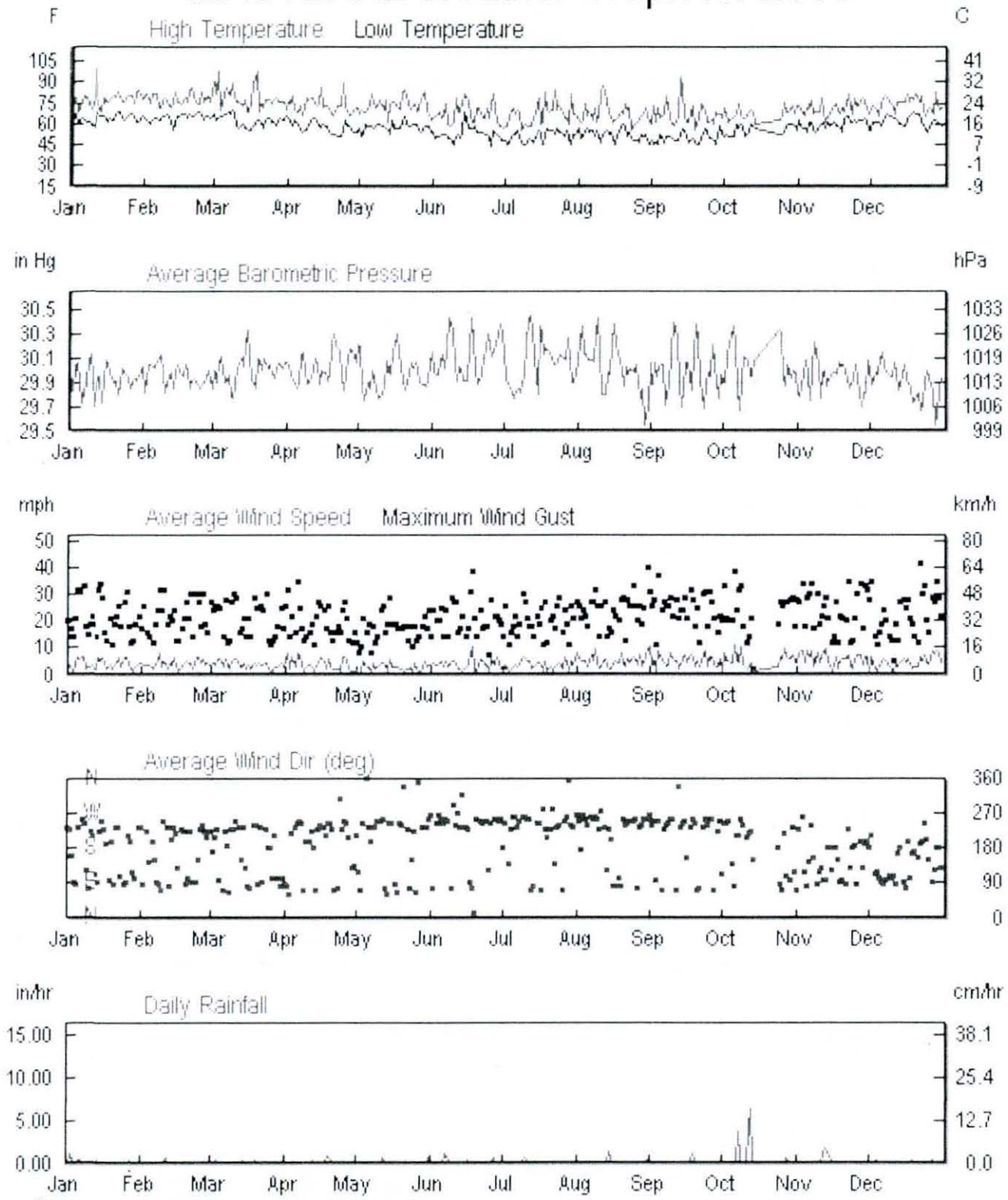
IEASTERN2 Weather Graph for 2007



IEASTERN2 Weather Graph for 2008



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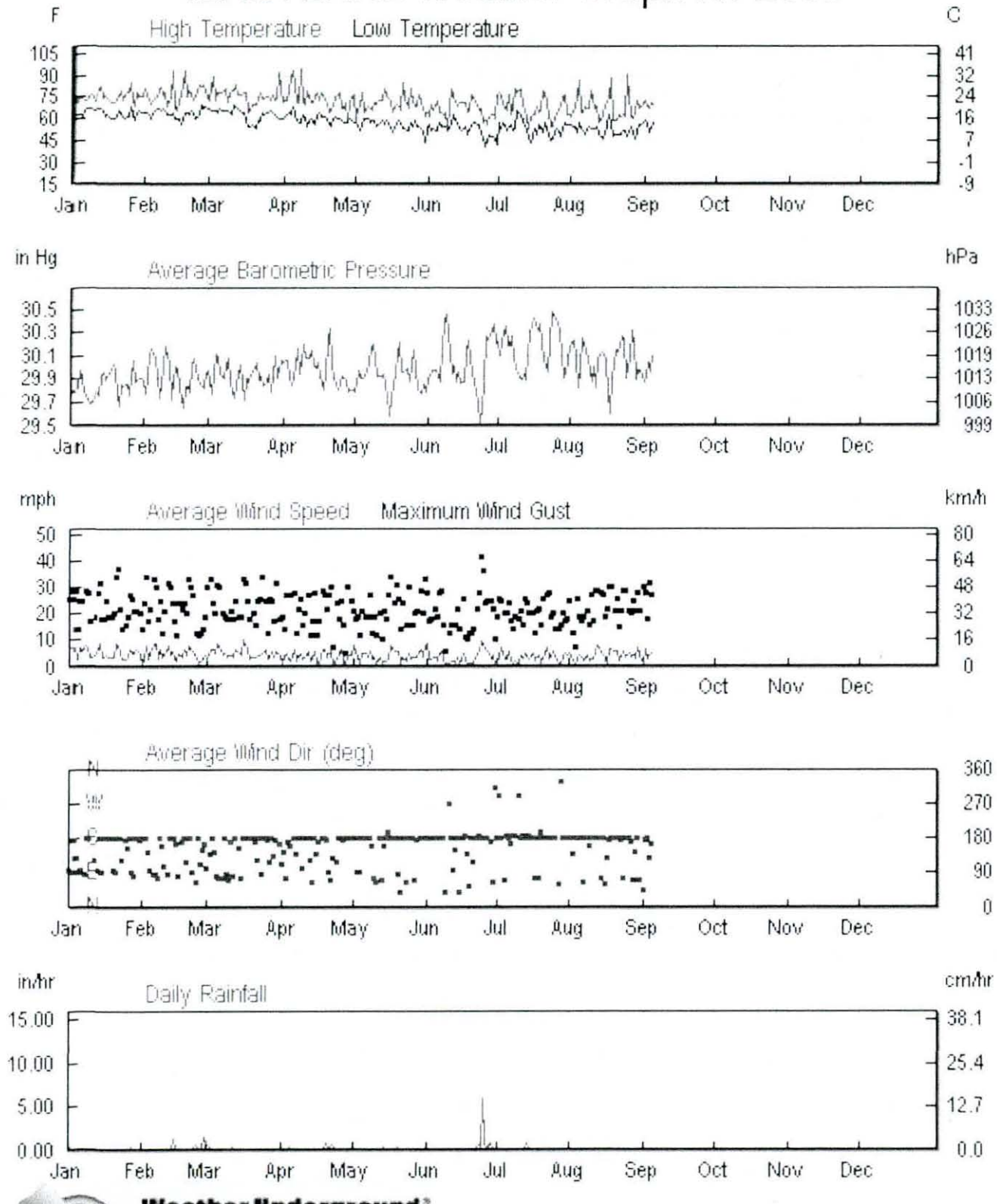
IEASTERN2 Weather Graph for 2009



1.3 *Topography:*

The topography is typical of wind-blown dunes, with east-west ridges oriented in line with the dominant wind, and localised depressions.

See **Map 1 – Regulation 2(2) Plan** attached hereto as **Annexure A**.

1.4 *Soil:*

The area proposed for mining is at present covered by marine wind-blown sands with poorly developed soils. The soil is essentially dune sand with a small amount of organic matter. The agricultural and forestry potential is low due to the prime potential of the land.

Topsoil overlays calcrete in some areas inland of that proposed for mining. Calcrete is resistant to erosion.

1.5 *Land Capability:*

The land capacity is mainly be wilderness land/grazing.

1.6 *Land use:*

- **Pre mining land use:**
  The mining area is currently being utilised for grazing by occupants in the informal settlement nearby. There are obvious signs of illegal sand mining visible on site.

- **Historical Agricultural Production:**
  It does not seem as if the land was historically used for agriculture. The proposed area is situated between a refuse site and a cemetery.

- **Evidence of Misuse:**
  There is no evidence of misuse; the ground was formally used for grazing.

- **Existing structures.**
  No existing structures are to be found. See **Map 1 - Regulation.2(2) Plan** attached hereto as **Annexure A**.

1.7 Flora:

1.7.1 Introduction:

The proposed mining area is located on the Arlington Site and a vegetation survey was conducted on the 1st and the 2nd of June 2009 by Mr. Wener Kotzé. The surveyed area was traversed by foot identifying all vegetation types inside the perimeters of the proposed mining area. The vegetation includes all indigenous grass, shrub and woody tree and creeper species as well as a number of invader and exotic plant species.

The diverse geology, relief, climate and soils of the Eastern Cape provide for the flora, which is noted for its phytogeographical complexity. The flora is transitional between Cape flora and subtropical flora. Many taxa of diverse phytogeographical affinities reach the limits of their distribution in this region. The Eastern Cape can best be described as a tension zone where four major biomes converge and overlap. All of the major vegetation types of South Africa i.e. forest, fynbos, thicket, karroo, grassland and savanna, occur within the Eastern Cape region forming a complex mosaic of communities composed of a diverse flora of mixed origins and affinities.

The importance of the families typical of Cape flora (e.g. Ericaceae and Aizoaceae) decreases as on moving eastwards, they are replaced by families of the subtropical region (e.g. Gramineae and Asclepidaceae). Thicker, described as being of Tongaland-Pondoland affinity, enters the region along the east coast and penetrates up the river valleys. Succulent and dwarf subdesert shrublands of the Karoo-Namib region extend down the dry river valleys from the arid interior. Afromontane elements extend down the mountains to sea level in the south-western region of the Eastern Cape, where the coastal forests are composed of many Afromontane species. Fynbos taxa of the Cape region are common on the infertile sandy soils derived from the Cape Supergroup rocks.

According to Low and Rebolo's (1996) classification the site of the mining area lies within an area where the Mesic Succelent Thicket vegetation type historically occurs.

1.7.1.1 Mesic Succulent Thicket

1.7.1.2 Synonym

Valley Bushveld (A23)

1.7.1.3 Statistics

1 931 km²; ± 51 percent transformed; 5.33 percent conserved.

1.7.1.4 Vegetation

The mining area, according to Acocks hosts transitional vegetation between Alexandria Forest and False Fynbos. The vegetation is stunted due to the poor nutritional status of the soil and is therefore an aspect that must be addressed properly during the rehabilitation process. The mentioned vegetation types are quite resistant to external influences but if soil structures are disturbed extensively, it struggles to recover and would require a dedicated and expedited rehabilitation process. It reproduces through vegetative means as well as seed but is a long-term process.

The indigenous vegetation has largely been removed on the property concerned through invasive plant cover. The area was covered by A. cyclops, red eye/rooikrans; and A. saligna, Port Jackson. Rooikrans stretches along the entire coastline from Port Nolloth in the north-west to beyond East London in the east, a distance exceeding 2,000 km. Port Jackson stretches along the Cape coastline from Saldanha Bay in the west to the Kei River in the east. Port Jackson and rooikrans are important invaders of fynbos vegetation. Successful biological control of Port Jackson, using an introduced gall-forming rust fungus, has greatly reduced the densities of populations and in the long term should provide complete control of this invader.

Since many of the indigenous plant species have died out in the proposed mine area relocation of species is not an option and once the area has been stabilized with a grass cover the applicant will have to rely on natural succession and reintroduction of commercially obtained species for the establishment of bush clumps. If any seedlings are found they must be removed from the development areas and be potted and placed in a cool and protected area until required during future rehabilitation processes. One of the existing cleared areas to the east could be used for this purpose. It is imperative that a phased approach be followed to ensure that environmental degradation is restricted to the minimum and re-vegetation success maximized. Soil structure will be a major consideration and the proposed upgrading must be performed to ensure the survival of seedlings, especially on the slopes. In order to protect disturbed areas and to prevent unnecessary visual impact the minimum vegetation must be removed at any given time. Vegetation on the dunes bordering the Mine area must be retained as windbreaker and visual screen.

Once re-vegetation of disturbed area starts this impact will emerge as a significant impact and the necessary control measures need to be implemented with specific reference to Rooikrans (Acacia Cyclops) and possibly Caster oil plants (Ricinus Communis), Solanum species and Olieboon (Datura Stramonium). Should this impact not be controlled the mined area will again be severely infested and must be prevented at all cost.

Due to the low conservation value of vegetation that will be removed during the mining process, the impact is rated as very low if appropriate mitigation measures are implemented. If the proposed re-vegetation strategy is implemented the impact can be rated of low positive significance over the

proposed mining term (2 years) and low-moderate at the end of the maintenance period (year 3-4)

With a vigorous re-vegetation programme, certain species will re-colonize affected areas and the specie composition and diversity will slowly improve but will most probably never reach the original status again. The success rate of re-vegetation will however, depend on concurrent rehabilitation and proper stabilization of soils by means of a secondary grass cover.

Vegetation Management Plan

- *Mining would be restricted to the area demarcated by the mine plan and the vegetation on the dunes flanking the mine area must be retained as screens and windbreakers.*
- *All plant species that can be transplanted, if any, will be removed from mine areas and be secured in a nursery area for use during the rehabilitation phase.*
- *Only the approved haul roads will be used and vehicles will not traverse virgin land.*
- *Disturbed areas at the quarry will be re-vegetated with a grass cover in the following manner.*

  Seeding with:

Cloris Gayana	*Eragrostis Curvula*
Themeda Trianda	*Eragrostis Teff*
Panicum Maximum	*Digitaria Eriantha*

- *It is also suggested that some of the transplantable species be introduced to grassed areas:*

Asparagus	*Osyris Compressa*	
Chrysanthemoides	*Monilifera*	*Carpobrotus*
Agathosma	*Stenopetala*	*Metalacia Muricata*

- *Water for irrigation purposes will be obtained from the said local municipality.*
- *Once the area has been vegetated, an alien control programme will be implemented and if necessary, an herbicide such as Garlon will be applied. Acacia Cyclops, Solanum species, Datura Stramonium, Sesbania Pudecae and Blue Thistle can be pulled or chopped down since it does not coppice, but Acacia Mearnsii & Acacia Longifolia do and must be timeously treated with the said herbicide.*
- *Veld fires will be prevented since it could affect the vegetation of the entire area as well as impacts on soil stability and fertility.*

The cover on the mining area consists mainly of spinescent shrub and woody creepers with many succulents. The diversity is high with a high proportion of endemics. Characteristic woody species include White Milkwood Sideroxylon inerme, Dune Kokotree Maytenus procumbens,Karoo Boerboon Schotia affra and Septemberbush Polygala myrtifolia, while succulent species such as

Uitenhage aloe Aloe Africana, Bitter aloe A. ferox, noorsdoring Euphorbia ledienii and E. grandidens may be common.
In light of the comments by DEDEA regarding the White Milkwood trees, the Company hereby undertakes to obtain the necessary permits before removing the trees from the proposed mining area.

A brief description of the values of the White Milkwood (Sideroxylon inerme) motivates the importance of conserving the above mentioned indigenous tree specie and will be stated below.

Family : Sapotaceae (milkwood family)
Common names : white milkwood (Eng.); witmelkhout, melkhoutboom,

Description
A small to medium evergreen tree, which grows to a height of 10-15 m. The tree has a sturdy trunk that is normally 600mm in diameter, and a large, dense, rounded crown. The bark is normally grey-brown to black. Young branches are always covered with fine hairs. The leaves are leathery and spirally arranged, dark green above and dull beneath. Fine hairs are also found on young leaves. The tree has small greenish white flowers with a strong, unpleasant smell. It flowers during summer and autumn (November to April). Fruits are purplish black, small, round and fleshy and like the leaves, contain milky latex, and are present from late summer to spring (February September).

Distribution

This species is commonly found in dune forests, almost always in coastal woodlands and also in littoral forests (forests along the sea shore).

Status

Sideroxylon inerme is widespread on mountains and is not an endangered species. It is, however, one of South Africa's Protected Trees, which means that no milkwood may be damaged, moved or felled.

Ecology

Speckled mousebirds eat flowers. Birds, bats, monkeys and bush pigs eat the fruit.

Uses

Bark and roots have medicinal value and are used to cure broken bones, to treat fevers, to dispel bad dreams, and to treat gall sickness in stock. The wood of the tree is said to very hard and fine-grained and is used as timber for building boats, bridges and mills. Ripe purple-black berries are said to be edible, with purple, juicy flesh and sticky white juice.

Vegetation management plan for indigenous woody species, that include Sideroxylon inerme (White Milkwood – see above photograph)

A number of rare and valuable trees were encountered during the survey. These species includes Sideroxylon inerme, commonly known as the White Milkwood, which plays a critical role in the infra-structure of the eco-system.

Areas where mining has been completed shall be partially re-vegetated by the above mentioned trees .These trees will be obtained by either purchasing them from local nurseries or by growing them on a small scale in a demarcated area of the mining area.

Growing Sideroxylon inerme

These trees can be grown from cuttings but only semi-matured side shoots should be used. The cuttings should then be potted up in a well-drained soil mix. Results have shown that seed sowing is the best method of propagation.

Grass species identified on site

A number of indigenous grass species was also encountered during the survey. All grass species could not been identified positively due to the fact that the survey was conducted in early winter and a lack of identifying factors always occurs this time of year. Grasses positively identified includes:
Eragostis Curvula, Cyndon Dactylon, Themeda Triandra, Digitaria Eriantha, Melenis Repens, Urochloa Mosambicensis, Aristida Barbicolis .

1.7.1.5 Site Botanical Description

All natural vegetation has on a great portion of the mining area been cleared. Stray cattle are feeding on the land.

1.7.1.6 Endangered or Rare Species

No endangered or rare species were recorded for the proposed mining area.

1.7.1.7 Intruder or Exotic species

The said site is highly degraded and alien plant species are numerous. Prominent woody alien plants occurring include Acacia spp., Pinus spp., Eucalyptus spp. and Casuarinas pp. (Beefwood).

Declared weeds and invader plants in South Africa

The Conservation of Agricultural Resources Act, No. 43 of 1983, as amended in March 2001, sets out the regulations regarding the control of weeds and invasive plants and provides a list of declared plants, in which they are divided into three categories. There is an exception in the regulations regarding biological control reserves. These are areas where permission is granted for declared plants not to be controlled because they are used for introducing and monitoring biological control agents (e.g. insects).

In total there are 200 species of plants that are declared weeds or invaders in South Africa. These include 121 woody species, 16 succulent species, 44 herbaceous species, 9 grasses and reeds, and 10 aquatic species. They are divided into three categories:

Category 1 species are declared weeds and totally prohibited.

- May not occur on any land or inland water surface other than in biological control reserves.
- Must be controlled by the land user on whose land or inland water such plants are growing.
- May not be planted or propagated.
- May not be imported or sold; and
- May not be acquired.

Category 2 plants are invasive species for which permission can be obtained to grow them commercially in demarcated areas but otherwise they must be removed.

Category 3 invasive plants can be maintained on your land if they are plants that were already growing at the time these regulations were promulgated (March 2001).

The most widespread and abundant acacias are Acacia mearnsii, black wattle; A. cyclops, red eye/rooikrans; and A. saligna, Port Jackson. Black wattle has invaded the widest range of vegetation types in South Africa and is the most widespread riverine invader; it occurs almost continuously from Louis Trichardt in the Northern Province down the eastern seaboard to Cape Town, a distance of about 2,500 km. Rooikrans stretches along the entire coastline from Port Nolloth in the north-west to beyond East London in the east, a distance exceeding 2,000 km. Port Jackson stretches along the Cape coastline from Saldanha Bay in the west to the
Kei River in the east. Port Jackson and rooikrans are important invaders of fynbos vegetation. Successful biological control of Port Jackson, using an introduced gall-forming rust fungus, has greatly reduced the densities of populations and in the long term should provide complete control of this invader.

It is important to note that as explained in the introduction, the land owner indicated that it has earmarked the above property for extension of the existing adjacent cemetery. It will further be observed from the letter of the municipality enclosed in this programme that in view of the latter proposed end use, one of the conditions in its comments on the consultation process is that it would prefer that the entire area be grassed with Kikuyu grass. As this is invader specie, this proposed use for the purpose of this programme will remain an alternative end use as it is not clear what participation process the municipality would have to undertake before this use will be approved.

1.8 Fauna:

1.8.1 Introduction:

Animals play an important role in maintaining ecosystem functioning for example pollination, spreading of seeds, removing of pests, trimming of vegetation and therefore determining penetrability of vegetation and generation of manure etc. The original Driftsands Bypass Dunefield habitat of the quarry area and to a lesser extent the fynbos pose a definite ecological niche for animal species since it could provide adequate forage, nesting place and protection for avian fauna whilst the under storage provide adequate protection and forage for browsers. Due to the extensive resources that these veld types offer original specie diversity would have been high. However, the site is located close to developed areas and informal settlements where poverty is a definite threat and dog hunting and poaching in this area is extensive resulting in mammals becoming increasingly scares. It should also be mentioned that the aggravating noise emanating from the departing and landing of large commercial, cargo and smaller aircraft at the nearby airstrip of the Port Elizabeth International airport (a horizontal distance of approximately 1,9 km away at the nearest point) over the years must have chased away most of the original indigenous mammals and other species from the area.

Removal of the proposed vegetation will not result in the extinction of any specie but could cause initially a decrease in specie diversity. The impact could be rated as very low due to the number of animals and species that will be affected. The positive economic impact (financially and value to building industry) of the proposed concern will definitely outweigh the mentioned impact.

It was during the field survey noted that a large number of bird species visit the mining area and surrounds and could include some of the following species:
Bar-throated Apalis
Yellow-Breasted Apalis
Black-collared Barbet
Cape Batis
Bokmakierie
Southern Boubou
Cape Bullbul
Sombre Bullblu
Terrestrial Bullbul
Forest Buzzard
Steppe Buzzard
Red-Chested Cuckoo
Spotted Dikkop
Red-eye dove
Tambourine Dove
Fork-Tail Drongo
African Fish Eagle
Blue-billed Firefinch
Blue-mantle Flycatcher

The noises generated on site will be from a limited number of people communicating and from the loaders, trucks and sand screen but would not be excessive and noise levels are anticipated to range between 50 and 70 decibels at the mine boundaries. Most of the noises would be low-pitched and would have a lesser impact on animals than what high-pitched noises would have.

Since there are very few remaining mammals on site, no detailed faunal survey was conducted. The more important animals that could be hosted by the proposed mine area are bush pigs, mongooses, vervet monkeys, duikers, African wildcat, genets, African civet, guinea fowl, locusts, field mice, lizards, hares, bush buck, lynx, herpentofauna species such as the Cape cobra, horned adder, puff adder, tree snakes, lizards, geckos, chameleon, tortoises (most of them has conservation status) etc and possible the tree dassie, which have become very rare and has not been spotted for some time.

During the operational phase, the impact on the fauna is rated low. Rehabilitating the quarry site would provide the opportunity for animals to re-colonize the area and the impact at closure is rated to be of low positive significance.

Remedial measures to be implemented are:

- Vehicles may not leak any fuel, oil or lubricants and will be maintained properly at all times.
- Vehicles will not drive within any vegetated areas and their movement will be restricted to the authorized mine area.
- No animals entering or settling in the mine area will be disturbed or killed and this requirement will be included in the environmental awareness programme, which must be discussed with workers on an annual basis by the owner of the sand quarry but preferably by a competent environmentalist.
- No hunting or snaring would be allowed. In addition, the owner or manager will remove any of the staff caught interfering with wildlife from the site.
- The quarry area will be developed in phases and clearing of vegetation will be restricted to the minimum area required for optimal extraction of sand.
- Veld fires will be prevented by not allowing any open fires on the mine area.

Pesticides may only be used in a controlled manner.

1.8.2 Vertebrates

1.8.2.1 Amphibians

It is not known how many amphibian (frog) species occur in the area, but the Eastern Cape has a diverse amphibian fauna, including 34 jtaxa (species and subspecies – CSIR 1997). Generally, frogs are useful bio-indicator species, as their reliance on both aquatic and terrestrial habitats at different stages of their life cycles, their need for damp habitats, and their permeable skins makes them vulnerable to pollutants and other anthropogenic effluents.

Numerous amphibians are likely to be found in the variety of habitats offered by die Coastal hydrological systems.

1.8.2.2 Reptiles

The reptile fauna of the area is particularly diverse, containing 56 species of lizards, chameleons, snakes, tortoises and sea turtles. Of these, 22 species are either Red Data, listed under the Convention on the illegal Trade in Endangered Species, or are endemic to the area or peripheral to the usual range of the species (Coastal and Environmental Services, 2001). These include eight lizards, two monitors, one gecko, one chameleon, three snakes, three tortoises and the four globally endangered sea turtle species. The most restricted range belongs to the Albany dwarf adder (Bitis albanice), recently described from the Coega area (Branch 1999).

The Arlington site has been under intensive agriculture use for several decades and it is unlikely that any of the sensitive species occur on the farm.

Consisting species of lizards, chameleons, snakes and tortoises should be relocated to nature reserves in consultation with the relevant conservation authority.

In view of DEDEA's comments on this particular section, it is to be mentioned that although no detailed survey was conducted, the same Mr Werner Kotze that conducted the field survey in regard to the flora, also conducted a field survey pertaining to the fauna and that he was simply attempting to indicate in his initial report that although these species were not intercepted during his survey (he traversed the property on foot) that they would be dealt with appropriately by the Company if found during the initial site clearance.

1.8.2.3 Aves

Among the large terrestrial birds, blue crane (Anthropoides paradiseus). Stanley's bustard (Neotis denhami), martial eagle (Polematus bellicosus) and the African marsh harrier (Circus ranivorus), secretary bird (Sagittarius serpentarius) and Knysna woodpecker (Campethera notata) are listed as Red Data Species (Barnes 2000). While the above species may utilise sections of the coast, none of the birds are known to breed in the Arlington area.

1.8.2.4 Mammals

Only two mammal species are endemic to the Arlington area: Duthie's golden mole (Chloratalpa durhiae) and the pygmy hairy-footed gerbil (Gerbillurus paeba exilis) which occur in dune thicket (CES 2001). It is unlikely that these species are found on the Arlington site.

Whilst the said site is partially transformed it is likely that duiker and bushbuck still occur in the natural areas of the site.

1.8.2.5 Endangered or Rare Species

No rare or endangered species are expected to occur on or in close proximity to the proposed mining area.

1.9 Surface Water:

None.

1.9.1 Surface Water Quantity:

Not Applicable

1.9.2 Surface Water Quality

Not Applicable

1.9.3 Drainage Density:

Not Applicable

1.9.4 Surface Water Use:

None.

1.9.5 Water Authority:

Nelson Mandela Bay Local Municipality.

1.9.6 River Diversions:

There is no river diversion required by mining operation.

1.9.7 Wetland

No wetland occurs on the site.

1.10 Groundwater:

The underlying fractured Table Mountain quartzite is a good aquifer, which is used in some of the surrounding areas.