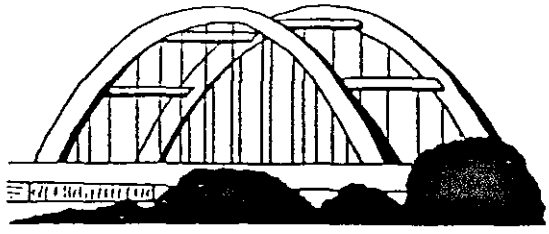
C A P E T E C H N I K O N

School of Civil Engineering

Town and Regional Planning

PORT ALFRED

INTEGRATED DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT STRATEGY



Thesis submitted in fulfilment of the requirements for the Master's Diploma in Technology (Town and Regional Planning - Environmental Management) in the School of Civil Engineering at the Cape Technikon. Date: April 1990

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D E C L A R A T I O N

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S Y N O P S I S

This report proposes a strategy for the development of Port Alfred situated on the south east coast of the Cape Province, South Africa.

The proposed development strategy takes cognisance of the importance of integrating development harmoniously with the environment.

The study is not related to any particular development proposal but is rather a guide to future development and the identification of potential environmental hazards.

Moreover, it could serve as a set of guidelines for land use planning and management at the urban scale anywhere in South Africa.

The evaluation methods used are adapted from widely acceptable analysis techniques and include a combination of both the matrix and the overlay or "sieve" method which graphically analyses physical attributes.

The study eminates from the Port Alfred Municipality's concern that demand for development could destroy the town's environmental quality and historical character which are seen as major tourist attractions.

The report is divided into two sections, the first being to acquaint the reader with the area, it's constraints and potential. Section 1 critically evaluates the existing

physical, socio-economic and cultural environments of the town.

The second part of the report (Section 2), combines the analysis of the physical and socio-economic environments into an Urban Structure Plan and management proposals which provide a basis for the spatial management and control of future land use development proposals.

The management proposals are based on the Integrated Environmental Management procedure advocated by the Council for the Environment which is adapted to suit local conditions and includes the use of a three stage "proposal call" system which is seen to ensure an equitable balance between the demand for development, public participation and conservation of the town's biotic and abiotic environments.

The "proposal call" system has been successfully employed in the United States of America for some years and was adopted by the Cape Town City Council in 1985 for disposing of council-owned land in a manner most acceptable to itself and the community.

By combining both the principle of Integrated Environmental Management and the "proposal call" system Port Alfred should be assured of a future planning strategy which will both enhance development and promote environmental conservation thereby assuring the maintenance of environmental quality.

S I N O P S I S

Hierdie verslag stel 'n strategie voor vir die ontwikkeling van die dorp Port Alfred, wat aan die suidoostelike kus van die Kaapprovinsie, Suid-Afrika gelee is.

Die beoogde ontwikkelingstrategie neem die belangrikheid van die integrering van ontwikkeling in harmonie met die omgewing in ag.

Die studie het geen verband met enige spesifieke ontwikkeling nie, maar verteenwoordig eerder 'n riglyn vir toekomstige ontwikkeling en die identifisering van potensiele nadelige invloede op die omgewing.

Dit kan dien as 'n stel riglyne vir grondgebruiks-beplanning en bestuur op stedelike vlak vir enige gebied in Suid-Afrika.

Die evalueringsmetodes wat gebruik is, word aangepas vanuit wyd aanvaarde ontledingsmetodes en sluit 'n gekombineerde tafelvormige en oorlegselmetode, wat die fisiese faktore grafies ontleed, in.

Die studie is onderneem weens die Port Alfred Munisipaliteit se bekommernis oor die druk vir ontwikkeling wat die plaaslike omgewingskwaliteit sowel as die historiese karakter mag vernietig.

Die verslag is in twee seksies verdeel, die eerste om die leser vertroud te maak met die gebied, sy beperkings en

potensiaal. Deel 1 lewer 'n kritiese evaluering van die bestaande fisiese, sosio-ekonomiese en kulturele omgewings van die dorp.

Deel 2 kombineer die ontleding van die fisiese en sosio-ekonomiese omgewings in 'n Stedelike Struktuurplan en bestuursvoorstelle wat as basis dien vir ruimtelike- en beheersbestuur vir toekomstige grondgebruikvoorstelle.

Die bestuursvoorstelle word gebaseer op die Geintegreerde Omgewingsbestuurs-sisteem soos verkondig deur die Raad vir die Omgewing aangepas vir plaaslike omstandighede en maak gebruik van 'n drievlakproses van evalueering en toekenning gebaseer op projek voorstelle - die sogenaamde "proposal call"-sisteem.

Hierdie verslag sal voorsiening maak vir 'n balans tussen die vraag vir ontwikkeling, publieke betrokkenheid en bewaring van die dorp se biotiese en abiotiese omgewing.

Die "proposal call"-sisteem is suksesvol aangewend in die Verenigde State van Amerika en is deur die Kaapse Stadsraad in 1985 aanvaar vir die afverkoop van munisipalegrond ten gunste van die gemeenskap en die Raad.

Deur die kombinasie van die beginsel van Geintergreerde Omgewingsbestuur en die "proposal call"-sisteem aan te wend, sal Port Alfred 'n toekomstige beplanningstrategie hê wat albei ontwikkeling en omgewingskwaliteit sal bevorder.


NAMIBIA
BOTSWANA
TRANSVAAL
Johannesburg
ORANGE FREE STATE
NATAL
Durban
CAPE PROVINCE
East London
PORT ALFRED
Cape Town
Mossel Bay
Port Elizabeth
ATLANTIC OCEAN
INDIAN OCEAN

LOCATION

T A B L E O F C O N T E N T S

SECTION 2 : STRUCTURE PLAN

L I S T O F F I G U R E S

SECTION 1 - EVALUATION OF EXISTING ENVIRONMENT

L I S T O F T A B L E S

I N T R O D U C T I O N

In the past decade South Africa has seen severe restrictions on its growth within the world economy due to sanctions. These sanctions have to a certain extent, however, been beneficial in the growth of local industries to ensure self-sufficiency.

One of these industries, the tourist industry, has grown with particular reference to the provision of facilities for local tourists who are now financially unable to travel abroad.

The Cape with its long stretch of coastline has been attracting an increasing number of visitors, especially from the inland areas such as the Pretoria, Witwatersrand, Vereeniging (PWV) Area. Although the Metropolitan areas (Primary Nodes) along the coast at present attract the majority of tourists by volume, smaller resort towns (Secondary Nodes) have a higher influx of tourists during holiday seasons relative to their resident populations.

This seasonal influx creates tremendous opportunity for local development but at the same time has become a matter of concern to the local authorities who are faced with the dilemma of balancing this development against the protection of their local environment. This environment has

often served as the catalyst or attraction which started settlement in the first place.

The environment has been defined in the Environmental Conservation Act of 1989 as "the aggregate of surrounding objects, conditions and influences, that influence the life and habitat of an individual organism or collection of organisms".

It appears therefore that in considering the human environment one would include all external conditions and circumstances which would affect the individual and a group.

The environment encompasses therefore more than the generally perceived biotic realm (living organisms) and in the case of human activity extends to the social, cultural and economic spheres on a macro and micro level.

It is this environment which until recently has been almost completely ignored in much land use planning in South Africa with only ad hoc references made when planning in areas already perceived to be sensitive.

It is this oversight in development approvals, often involving political decisions which ignore the advice of land use planners, which has probably led to the negative perception of development by the public. "Development is generally thought of as a process for improving human well-being through the reallocation of resources that involves

some modification of the environment whereas conservation is popularly regarded as the antithesis of development, the protection of certain environmental resources from the effects of development." (Fuggle R F, 1988. Integrated Environmental Management in South Africa)

The problem then is to find a method through which a balance between development and conservation or protection of environmental regimes can take place.

The present policy for the coastal area as set out in sub-regional structure planning of the Cape Provincial Administration is one of nodal (at existing towns and resorts) rather than so-called "Ribbon" development. This policy which aims to provide "wilderness" areas between coastal towns does, however, put pressure for development on those towns themselves.

There has been a substantial increase in the number of development proposals concerning coastal development in recent years, such as the marina at Port Alfred, the controversial Robberg harbour proposals and developments at St Francis Bay.

It is therefore felt that a need exists for a strategy towards development which takes careful cognisance of the fact that although environmental change is inevitable, that this change will benefit the community as a whole.

The object then of this study is to apply accepted methods

of analysis leading to a strategy in the form of a Structure Plan and guidelines which could be followed by a local authority to ensure that a balance between pressure for development and environmental protection is maintained.

The approach to analysis and the formulation of the Structure Plan can be used as a basis for the formulation of structure plans for other coastal towns where only certain of the parameters such as the economic base, physical attributes etc. need be adapted.

The area within the municipal boundary of Port Alfred has been chosen as the study area as it is one of the resort towns along the Cape coast and the fact that a marina development was recently completed which is seen to provide a catalyst for further development due to the multiplier effect which can be expected. The study does however extend beyond this defined area as it is felt that the potential and constraints of the immediate periphery should be considered.

The Port Alfred Municipality has also indicated it is concerned with the maintenance of the town's environmental quality as well as providing opportunity for development to enhance the living standards of the local population.

For ease of reference the report is presented in two sections. The study firstly critically examines the existing environment in Section 1 in terms of land use patterns, demography and the socio-economic environments in

order to form a basis for development proposals and management policies.

This information then leads on into Section 2 which introduces a combined tabular and overlay method of analysis in which physical and biologically sensitive areas are identified and proposals made as to their protection.

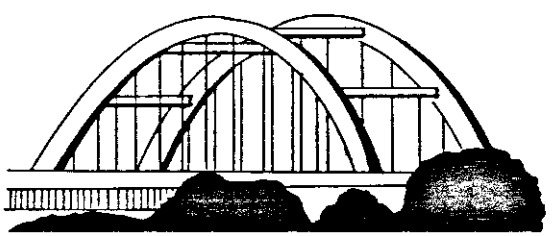
By using the results of the analysis an Urban Structure Plan is prepared and conceptual proposals made for the development of areas considered to possess unique potential. An example of a Local Structure plan for one of these areas is also shown.

Thirdly, a management strategy is proposed which is based on the practical application of the principles of Integrated Environmental Management as published by the Council for the Environment and a "Proposal Call" system.

It is felt that the methodologies used and the management proposals which are made could easily be adapted to suit environmental and socio-economic conditions of other coastal towns.

This report could therefore be used as a basis for the formulation of Structure Plans and policy by local authorities in general.

SECTION 1



EVALUATION OF THE EXISTING ENVIRONMENT

1

THE ESTABLISHMENT AND GROWTH OF PORT ALFRED

1.1 EARLY DEVELOPMENT - 1700 to 1945:

The first known European records of the area now known as Port Alfred are from the Portuguese who frequented the area in the sixteenth century and it is possible that they entered the estuary to take on water at a spot which they named St Mary's Cove.

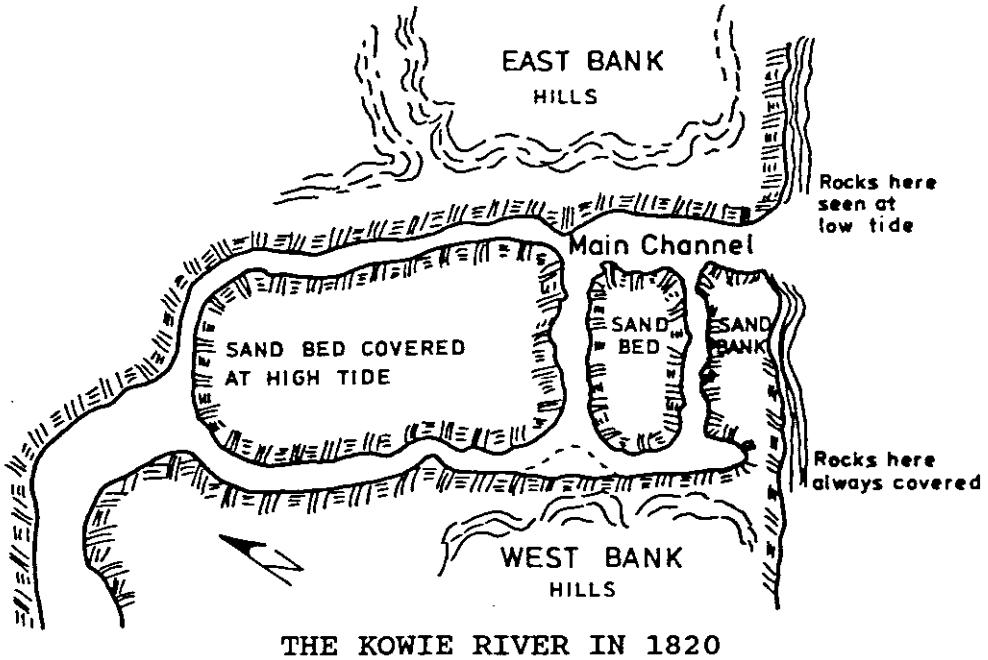
Port Alfred first became established as a settlement began soon after 1820 when the English settlers arrived on the east coast of Southern Africa. .

In 1820 the Kowie estuary was a large swampy area bordered on the east and west by rolling hills and hidden from the sea by high sand dunes which shifted with the wind and the meandering river mouth.

At the time of the first settlements, which took place on the slopes of the West Bank hills, the main stream of the river flowed through what is today known as Berrington's Cove, along the foot of the hills to break through the dunes on the eastern side. (Figure 1.1)

The history of the "harbour" at Port Alfred has been tied to the inventive schemes of many settlers who envisaged a prosperous sea-port town, exporting the products of the

Eastern Cape to Britain and Europe.



THE KOWIE RIVER IN 1820

FIGURE 1.1

The first harbour master was appointed in 1835 and was charged with the task of making a successful harbour out of the place.

Between 1825 and 1835 ships did undertake the perilous entry into the river until it was decided to dig a channel through the dunes on the western side, filling up the lesser channels, and allowing the main stream to reach the sea. Work was commenced in 1836.

The method used was to drive stakes into the riverbed along the intended course of the bank. The stakes were then weaved together in a similar fashion to basket weaving to form partitioned rows. These were then filled with layers of bush and sand which in time compacted to form solid

banks and lead to the place's nickname, "The Basket Work Harbour".

The river broke through on the intended course on 7 February 1841.

It was assumed that the force of the river flow and the tidal action would be enough to remove the sand which accumulated as a bar in the breaker zone; this was unfortunately found to be erroneous.

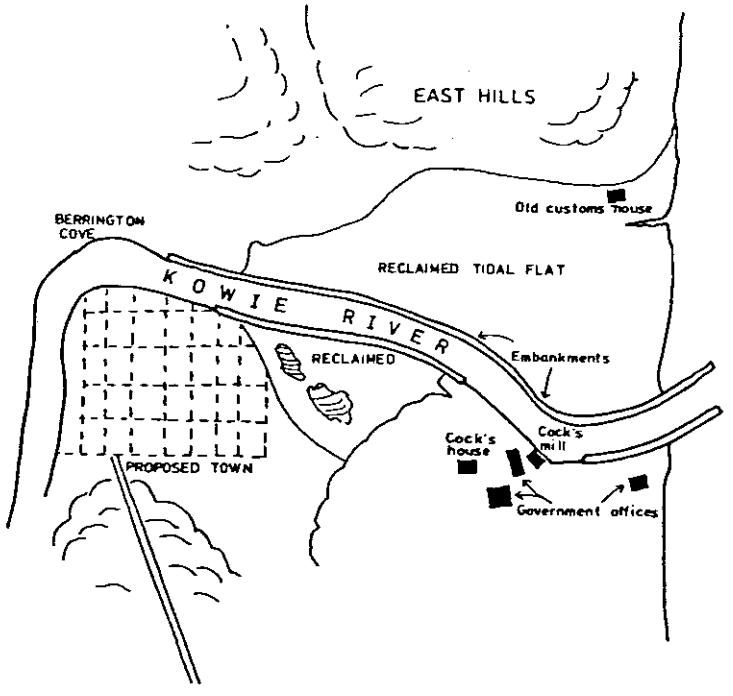
It was then proposed to extend the embankments along the rocky platform for about 180 metres to a point where the water would be 3 to 6 metres in depth so as to maintain the velocity of the water as far as possible into deep water.

This can be seen in a copy of a map of the area drawn up in 1852 (Figure 1.2).

Until this time the main settlements had remained on the high ground of the western hills overlooking the sea and with farmsteads in the adjacent hills.

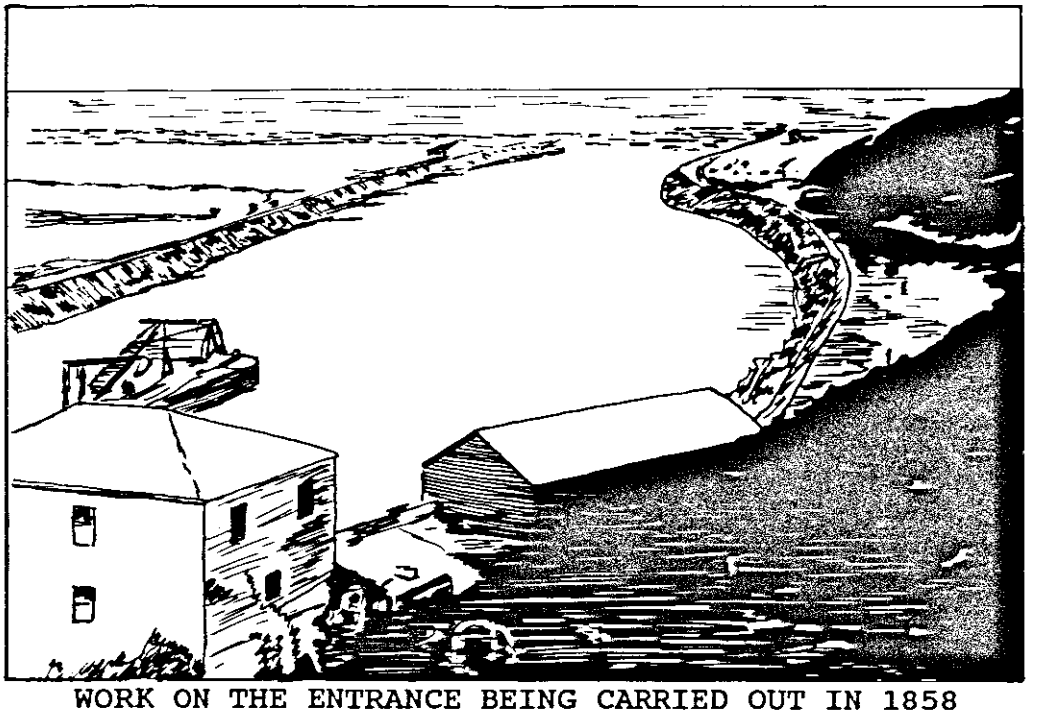
The location of the new town, proposed by the Cape authorities in 1850, as shown in Figure 1.2 might perhaps have been logical at the time being the only flat land in the immediate vicinity but one questions the overall wisdom considering that the whole area is located below the 50 year flood line.

The town had previously gone under the names of Kowie Town,



THE KOWIE IN 1852 SHOWING COMPLETED RETAINING WALLS

FIGURE 1.2



WORK ON THE ENTRANCE BEING CARRIED OUT IN 1858

FIGURE 1.3

Port Kowie, Port Heathcote, Richmond, Victoria, Port-O-Grahamstown and Port Francis until this name was changed to Port Alfred in 1860 in honour of the then Duke of Edinburgh, Prince Alfred the son of Queen Victoria.

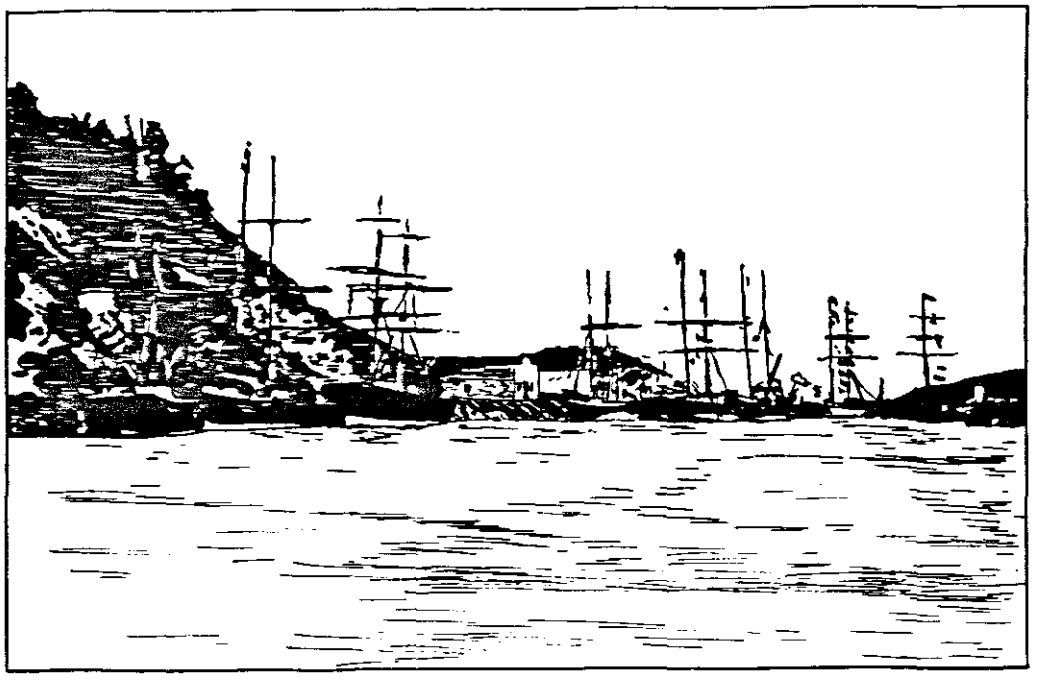
In 1870 work commenced on the provision of wharfing facilities near Berringtons cove on the opposite side of the river from the growing town. (Figure 1.4)
This decision was obviously governed by the depth of water available, being on the outside of the river bend, but access to the town itself was possible only by ferry.

During the first five years the harbour did appear to be profitable.

YEAR	IMPORTS (Tons)	NO. OF SHIPS	EXPORTS (Pounds)
1871	4761	23	50 370
1872	7473	30	101 344
1873	6796	39	93 176
1874	9813	49	67 502
1875	11061	67	51 534
1876	12750	101	86 943

TABLE 1.1

The importance of the town as a service centre to the agricultural sector had grown to such an extent, mainly because of its access to the sea (however dubious that may have been) that in 1881 the construction of the Kowie Railway line to Grahamstown was commenced thus expanding its communication channels with the hinterland.



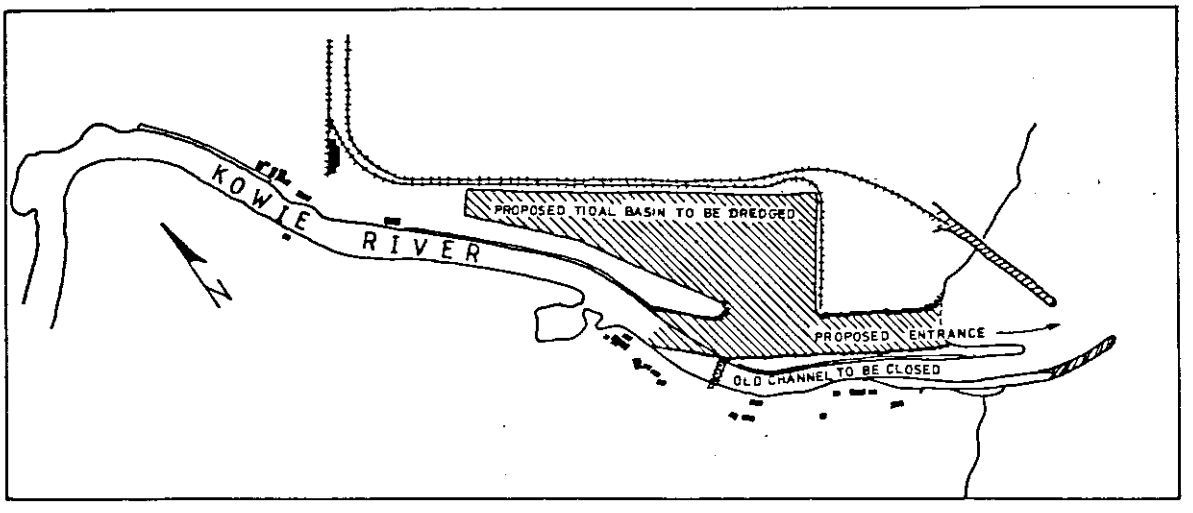
SAILING VESSELS MOORED IN KOWIE HARBOUR

FIGURE 1.4

The railway was operational by 1884 with the completion of the bridge over the Blaaukranz gorge between Port Alfred and Grahamstown. Here again, because of the difficult terrain, the railway was forced to approach the town from the east and the station was located on the opposite side of the river to the now established town. The position of the railway station makes sense in relation to the commercial loading facilities at the wharf but when considering accessibility to facilities it would have been more logical for the town to have grown on the eastern bank. Housing for those employed at the wharf, merchants, inns and the like would logically have located near the harbour. Only the storage buildings which remain show

evidence of this.

In 1901 the harbour engineer for Natal proposed an ambitious scheme involving some half million pounds to dredge a new basin and entrance channel which he erroneously considered would be superior to East London.



PORT ALFRED AS PROPOSED IN 1901

FIGURE 1.5

The proposal, although practical, was eventually turned down by the government because of the estimated 15 000 pounds which would have to be spent annually on dredging maintenance.

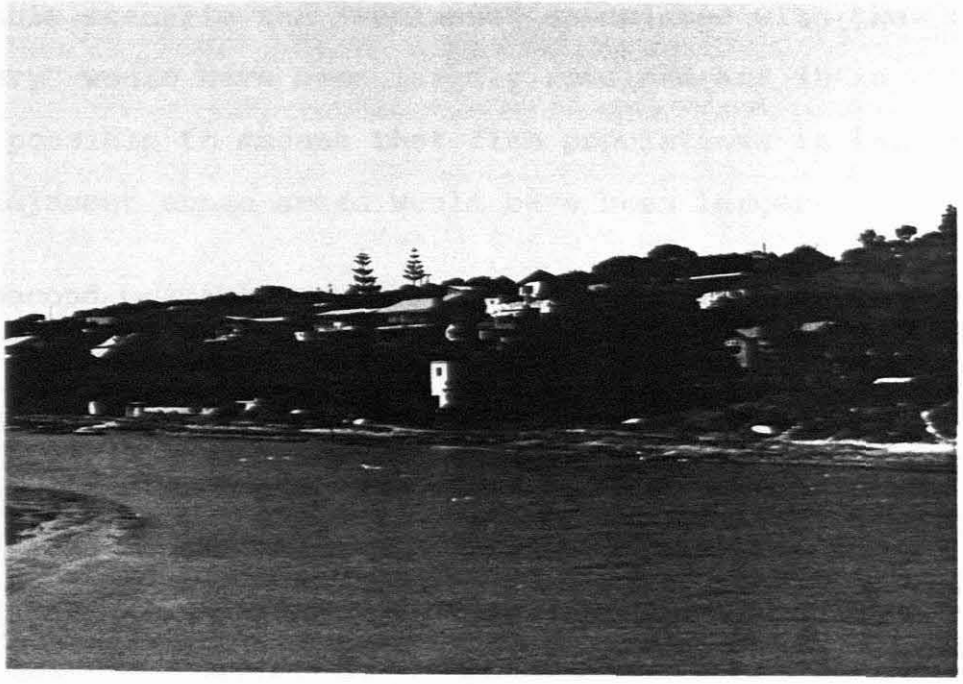
With the advent of the large steam mailboats and liners all prospects for a sea port vanished although a further attempt was finally abandoned just before the Second World War.

The town did, however, continue to thrive as the local

fishing industry became established.

In analysing the historic growth of Port Alfred and, considering certain decisions that were taken, leads one to two main scenarios which could indicate how the town could otherwise have developed.

The first of these considers that had the events which took place between 1820 and 1825 not occurred or had the engineering work to change the course of the river not been undertaken, the town would not have developed into more than a latter-day holiday resort similar to Boesmans River which is approximately the same distance from Grahamstown.



BOESMANS RIVER

FIGURE 1.6

Had a much smaller town developed, similar to Boesmans River, the low-lying area on the inside of the river bend would have remained, probably allowing changes in the course of the river as indicated during seasonal fluctuations of rainfall in the catchment area.

The river mouth would have been able to meander between the eastern and western cliff faces over time as can be seen in other estuaries of the eastern and southern Cape coast. Amongst others, examples include the Van Stadens, Gamtoos and Kromme rivers in St Francis Bay, the Keurbooms at Plettenberg Bay and the Bree River at Witsand the estuarine mouths of which all have a history of shifting their positions along the coast with changing seasons.

In this scenario the "wetlands" associated with the river estuary would have been largely retained and it is therefore possible to assume that fish populations in the river and adjacent ocean areas would have been larger.

The second possible scenario could consider how the present day town would have been spatially arranged had the decision in 1852 to position the town on the flats in the bend of the river not been taken.

Here one sees the town developing on the eastern bank of the river.

The topography immediately adjacent to the river and the wharfing facilities is excessively steep in comparison to

other developed areas and one might have seen development very similar to that found in the many coastal towns of Devon and Cornwall in England (Figure 1.7).

DARTMOUTH - DEVON

FIGURE 1.7

At this time road transportation within the urban environment was not as prolific as it is today and stepped pedestrian access up slopes would have been perfectly acceptable.

Further development would then have logically taken place on the eastern hill tops where the Black township is situated at present.

The development of the town on this side of the river would have consolidated the wharfing facilities and railway access whilst leaving a unique built environment for latter

day tourists unlike the present Central Business District which is relatively flat and uninteresting.

Development would probably still have expanded onto the western bank but would have been more contained and it is possible that the road access to the beach presently along the bank would have been placed to the west allowing direct access to the river.

This scenario would have suited the present development of the marina in that further consolidation would have taken place rather than the present fragmentation of the town.

1.2 PRESENT DEVELOPMENT

Port Alfred has slowly grown as a holiday resort and as a local fishing industry. Recently established industries or commercial outlets indicate that the town has continued to grow in regional importance as, amongst others, an agricultural and retirement centre. The atmosphere has remained rural in that holiday influx occurs mainly twice a year.

National interest was once again focused on Port Alfred when a report published by the Council for Scientific and Industrial Research (CSIR) in the late 1970's identified Port Alfred as a possible harbour site, this time for small fishing and pleasure craft. (CSIR T/sea 8012)

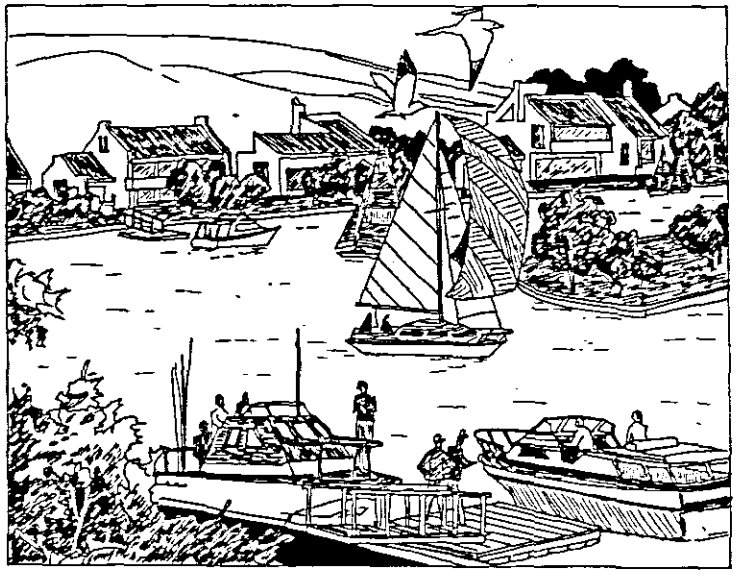
The Port Alfred municipality approached the Fisheries Development Corporation of South Africa in 1981 for advice

on the construction of a small craft basin adjacent to the Kowie River.

The site identified as the best probable location was the Lower East Lagoon area which was part of the same area proposed for harbour development in 1901. (FDC Report - "Port Alfred Proposed Small Craft Harbour"-162/1)

Unfortunately, at that stage the municipality was unable to raise the finance required and the scheme was shelved.

In 1986 the municipality was approached by a development company who proposed the building of a small craft harbour in the position advised by the Fisheries Development Corporation , as well as a residential marina in the area known as Blue Lagoon , exactly in the position of the 1901 proposal.

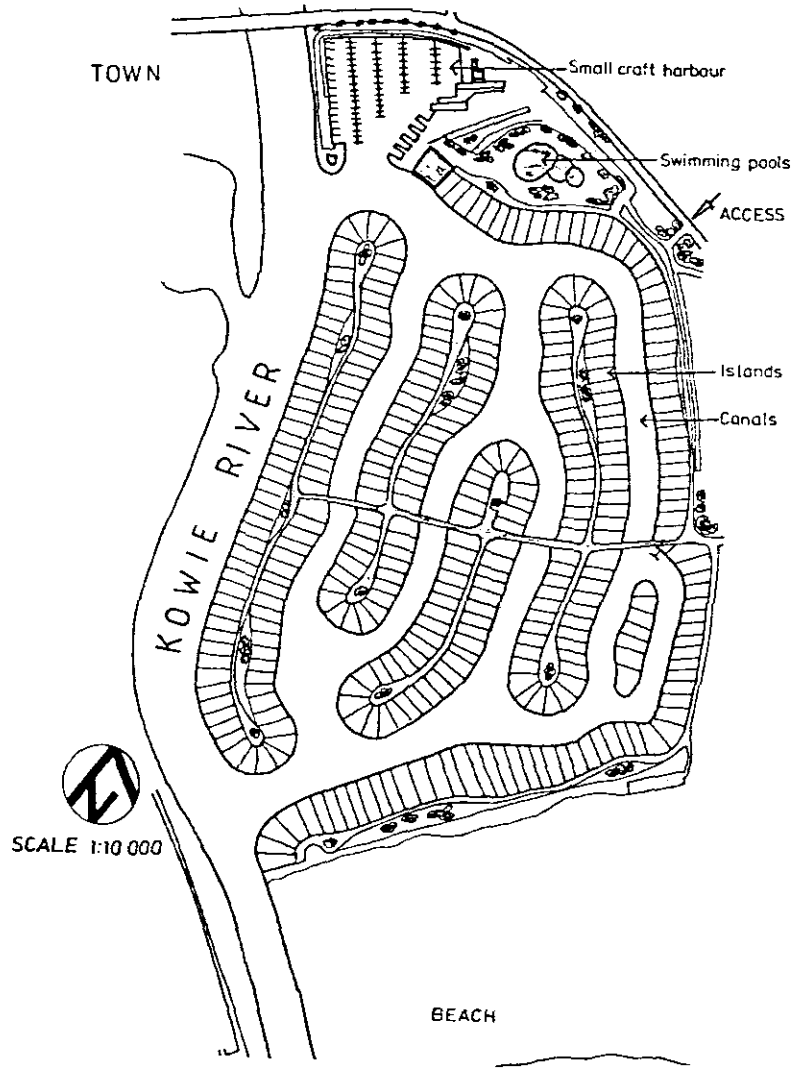


THE ROYAL ALFRED MARINA - AS PROPOSED BY THE DEVELOPERS

FIGURE 1.8

Construction on this project began in 1987 and was completed late in 1989.

It is this huge project which has once again focused attention on the Kowie river and its problematical entrance. Design challenges include the prevention of siltation and water stagmentation in the canals, environmental compatiblity with the estuary and fish breeding areas, and the design of a safe access to the sea.



MARINA DEVELOPMENT PLAN

FIGURE 1.9

2

THE PHYSICAL ENVIRONMENT

2.1 GEOMORPHOLOGY

2.1.1 TOPOGRAPHY

It can be seen in Figure 2.1 that the majority of the area surrounding Port Alfred comprises of gently sloping hills. The high lying land is in excess of 60 m above Mean Sea Level (MSL) and slopes are approximately 1:100 which contrast sharply with the land immediately adjacent to the river where slopes of 1:5 and steeper are quite common.

The residential components of the urban morphology have therefore located mainly on the less steep slopes of the surrounding hills with only high value residences being built on the river escarpment which have afforded good views of the river.

The Central Business District (CBD) and adjacent residential area lies in the river ravine which has levels between 1 m and 2 m above MSL and which makes the area liable to flooding. This has occurred on several occasions after heavy rains when problems were experienced in draining water from the road and pavement areas.

2.1.2 *FLOOD PLAIN*

The Kowie River flood plain divides the town in two, and

large areas of the land are below 5 m above MSL, including the CBD and the Royal Alfred Marina (See Figure 4.2 - General Land-use).

At the coast where the tidal estuary is present no delta is formed but sand and mudflats have been deposited where the river flow is checked by the tidal influence of the sea. It is this sand bar that has created problems in the past and only with its removal will access to the Kowie river become safe.

A fresh-water channel is scoured out through the deposits by the river flow. The natural meandering of the river has been temporarily halted by the canalisation of the lower reaches but the remote possibility of extreme flood events such as was seen in Natal during 1987 could drastically change this.

2.1.3 COASTLINE

The West Beach area is relatively dynamic with dunes along West Beach Drive being aggregated and disaggregated by seasonal winds.

Two main types of dune occur here, namely the Mobile dunes (Transverse barchanoid) which form part of the general circulation cell of the beach and Stable dunes (Bidirectional parabolic dunes) which are part of the primary dune structure of the beaches. (Tinley 1985)

These dunes are extremely sensitive to wind and are protected mainly by binding dune vegetation. Any development proposals for the beach and primary dune area should take cognisance of this fact and ensure that exfoliation does not take place. Increases in human traffic across these areas could be extremely detrimental.

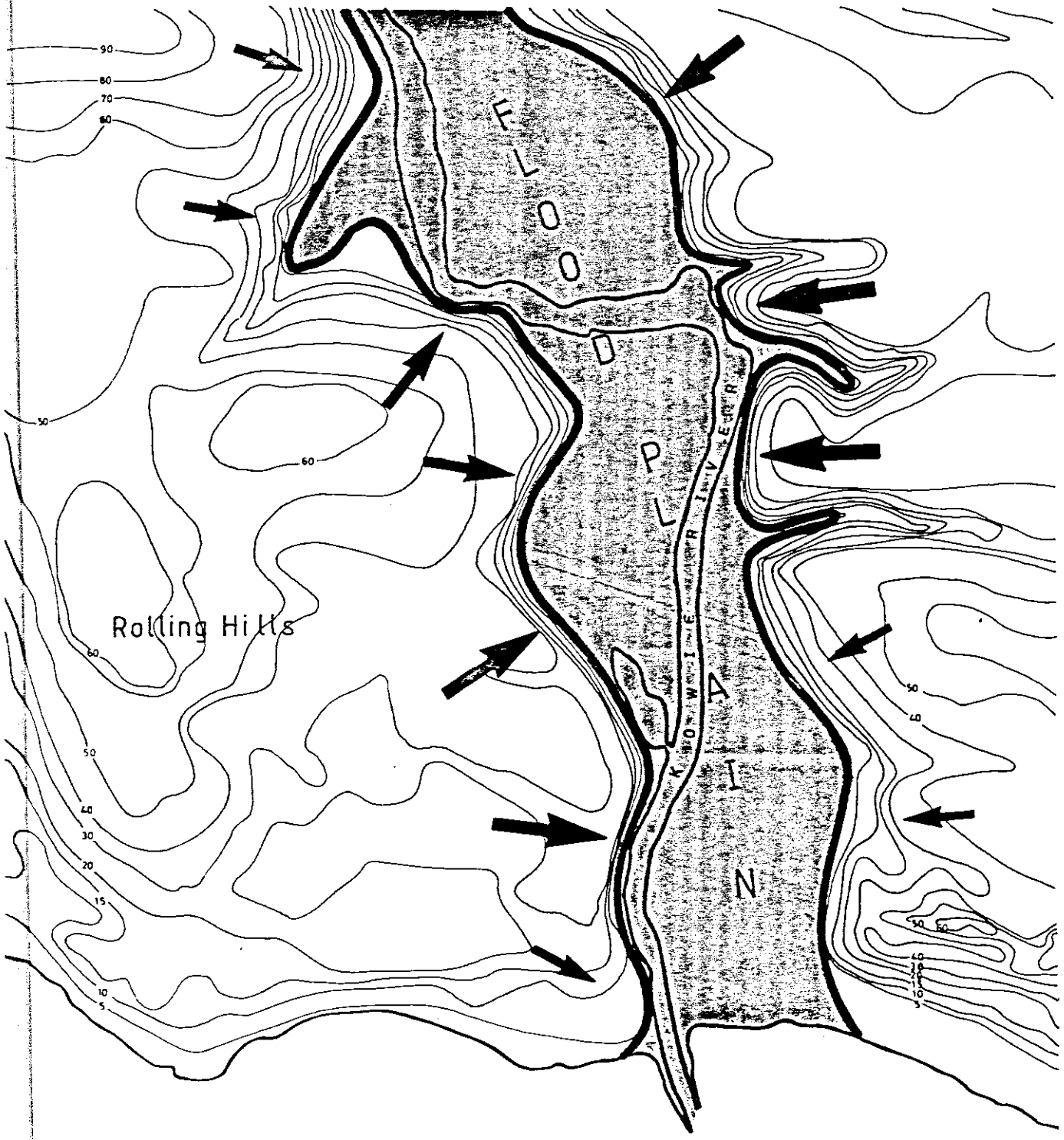
The shore line is, however, relatively stable as can be seen in Figure 2.2 which gives an indication of sand movement and waterline positions between 1967 and 1987. (From aerial survey photographs taken for the Estuarine Research Unit of the C.S.I.R.)

The top diagram in Figure 2.2 shows the stable condition that existed during the period until 1975 after which the influence of the coastal road in front of the newly-built holiday flats begins to become evident.

In the lower diagram (Figure 2.2) it can be seen how the development of the primary dunes (at the holiday flats) have caused the dune line to move seaward, thus influencing the general waterline. It can be seen how the beach width has increased from the previous average to the 1981 and later 1987 position.

The general water line has also become dynamic on the east beach and could be attributed to the changes on the west beach.

Development which causes change to the littoral area can



PORT ALFRED
TOPOGRAPHY

SCALE 1:20 000

FIG 2.1

have detrimental effects on the stability of the coastline, either causing an accretion of sand through sediment deposition or erosion caused by the changed current pattern. It is therefore important that development which is to take place within this zone be carefully investigated and monitored to ensure that no negative changes occur.

Further west the coastline becomes more rocky, forming bays which act as sand traps and form semi-protected sand beaches such as Kelly's Beach. (Figure 2.3 - Dynamics)

The near-shore current runs north-easterly up the coast forming an eddy on the opposite side of the West Pier which deposits sand in the river mouth.

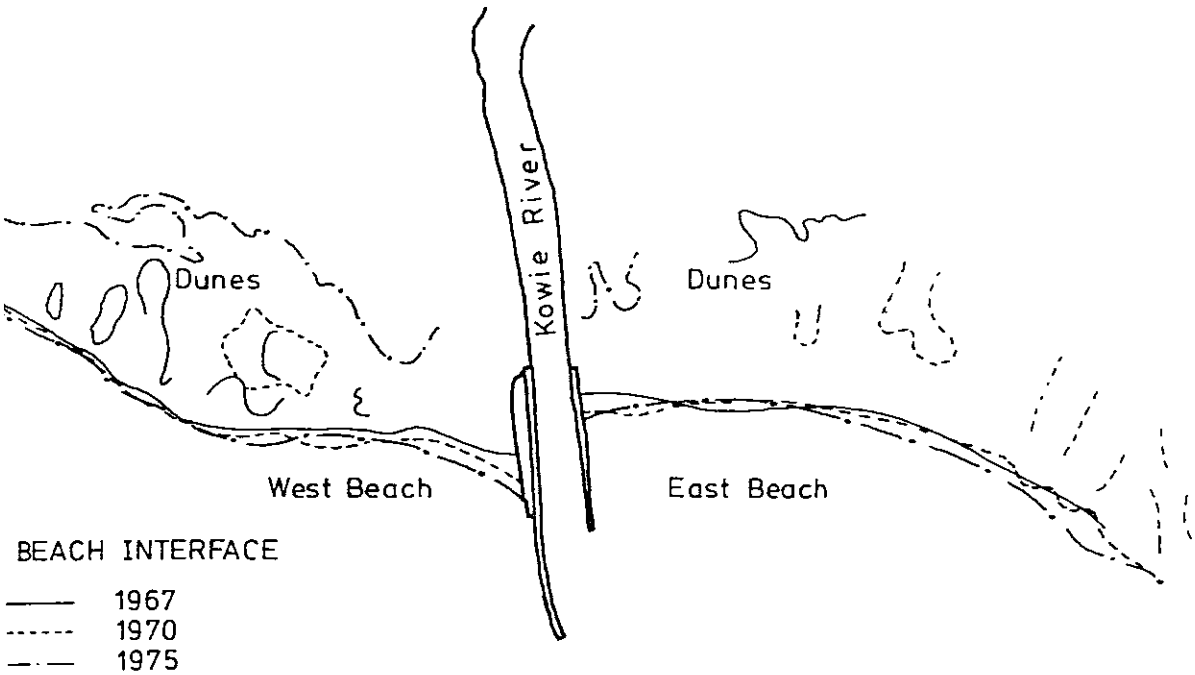
There is a predominant swell from the south which also assists the littoral drift of sand and sediment up the coast.

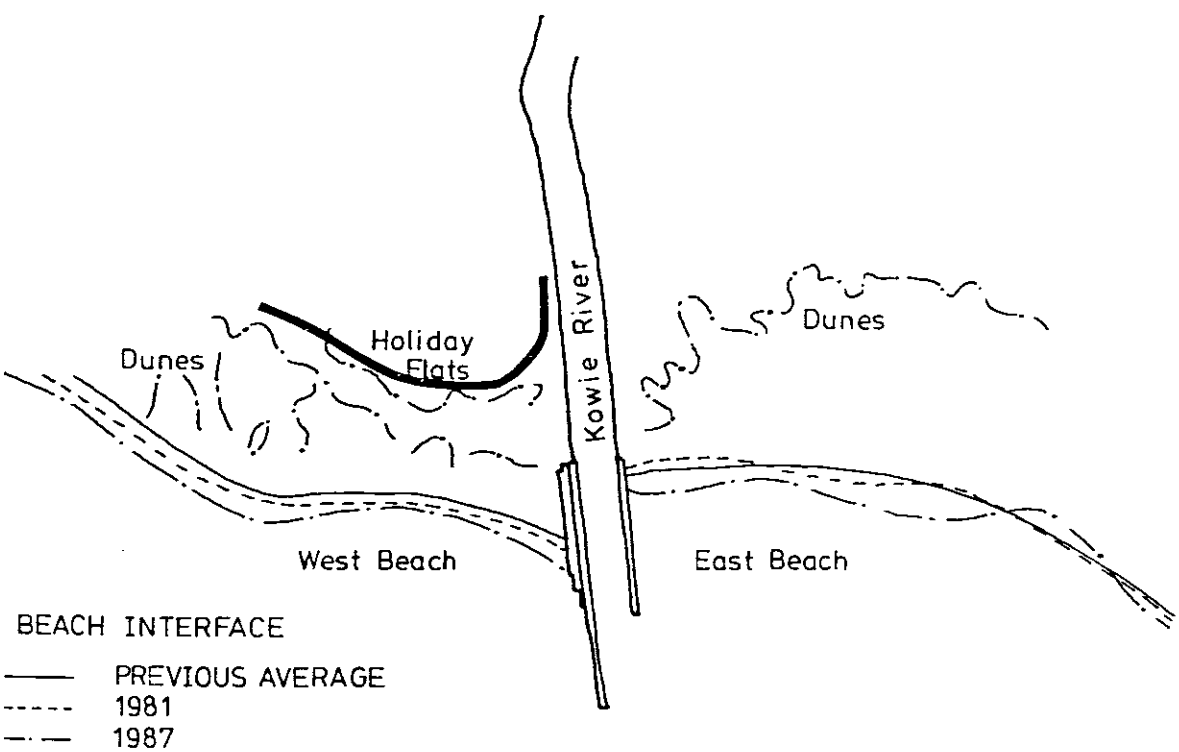
The East Beach area is wide and the primary dunes climb quickly to 40 m as can be seen in the typical beach profiles in Figure 2.3 . These dunes are more stable due to less development in this vicinity.

2.1.4 GEOLOGY

The underlying geological layers of the area are fine-grained sandstones and eroded shales of the Bokkeveld group overlain by Alexandria pebbles and calcareous sands.

On top of this base layer are the wind blown semi-

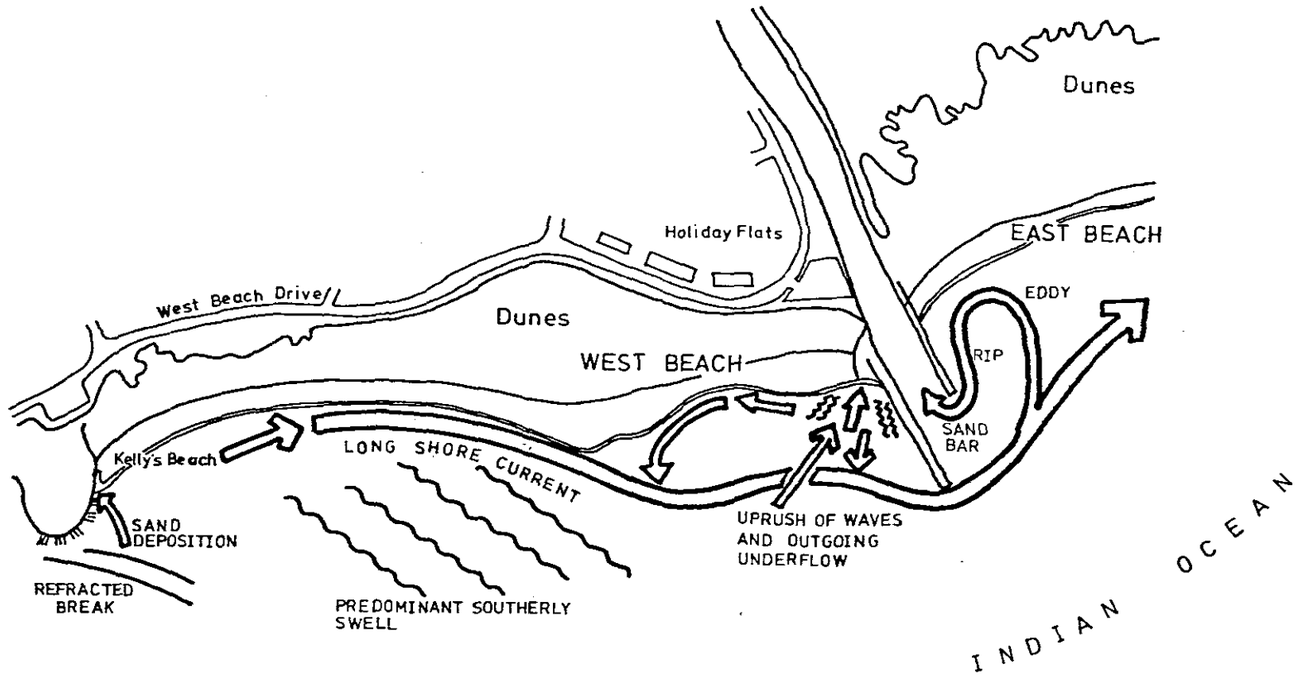




SOURCE : Produced from aerial photographs – CSIR (Savage JR 1989)

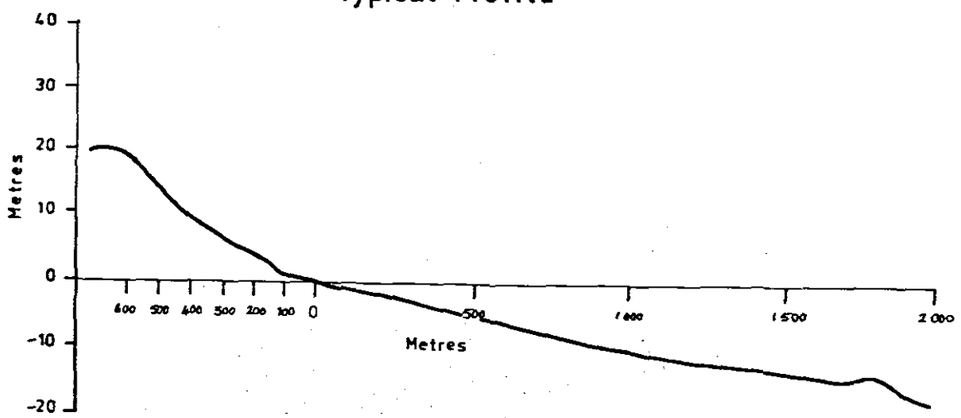
PORT ALFRED
COASTLINE STABILITY

FIG 2.2

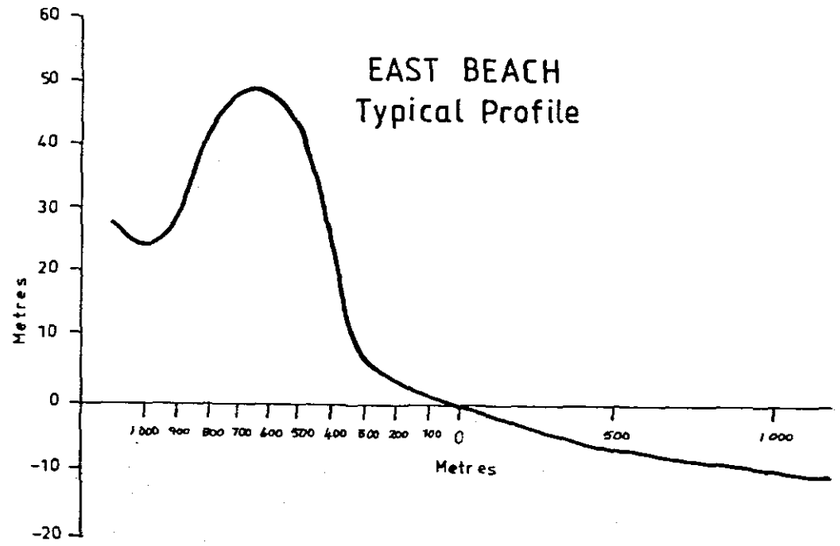


DYNAMICS

WEST BEACH
Typical Profile



EAST BEACH
Typical Profile



HORIZONTAL SCALE - 1:20 000
VERTICAL SCALE - 1: 1 000

LEGEND

The typical profile sections have been compiled by combining contours obtained from Orthophoto No 3326 DB 9 and depth soundings carried out in 1988 by the Coastal Structures Division of the Cape Provincial Administration.

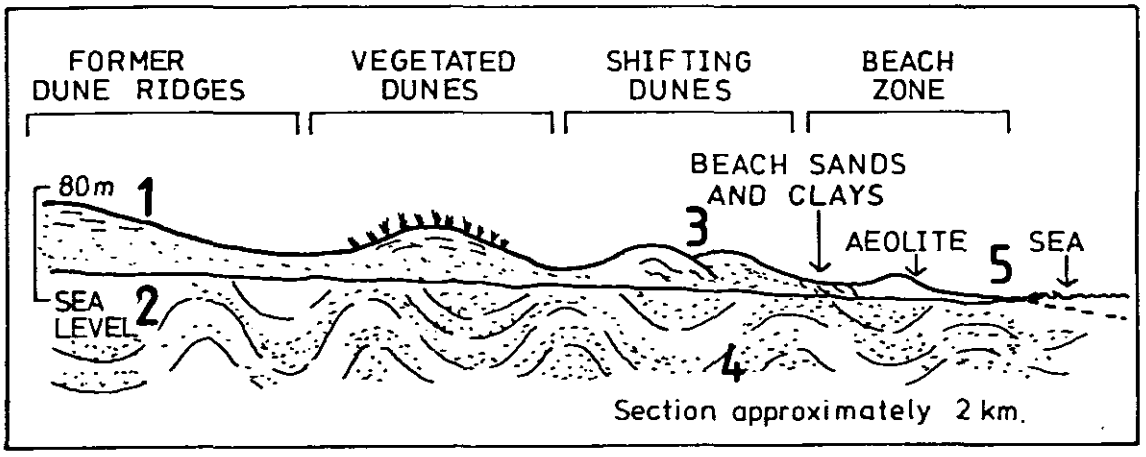
Dynamics plan adapted from Port Alfred Beachfront Study (Plan Associates-1987) and aerial photographs - C.S.I.R. Job No. 326, 1979 (Savage, J R & Rüther, H)

PORT ALFRED
COASTAL MORPHOLOGY

FIG 2.3

consolidated sands and discontinuous calcrete. (Figure 2.4)

In the ravine formed by the Kowie river are estuarine deposits with interdigitation of lagoonal, beach and aeolian sediments.



1 - SEMI-CONSOLIDATED SANDS - DISCONTINUOUS CALCRETE

2 - ALEXANDRIA PEBBLES AND CALCAREOUS SANDS

3 - WIND BLOWN DUNES WITH CALCRETE & PALEOSOL DEPOSITS

4 - BOKKEVELD SANDSTONE AND SHALES

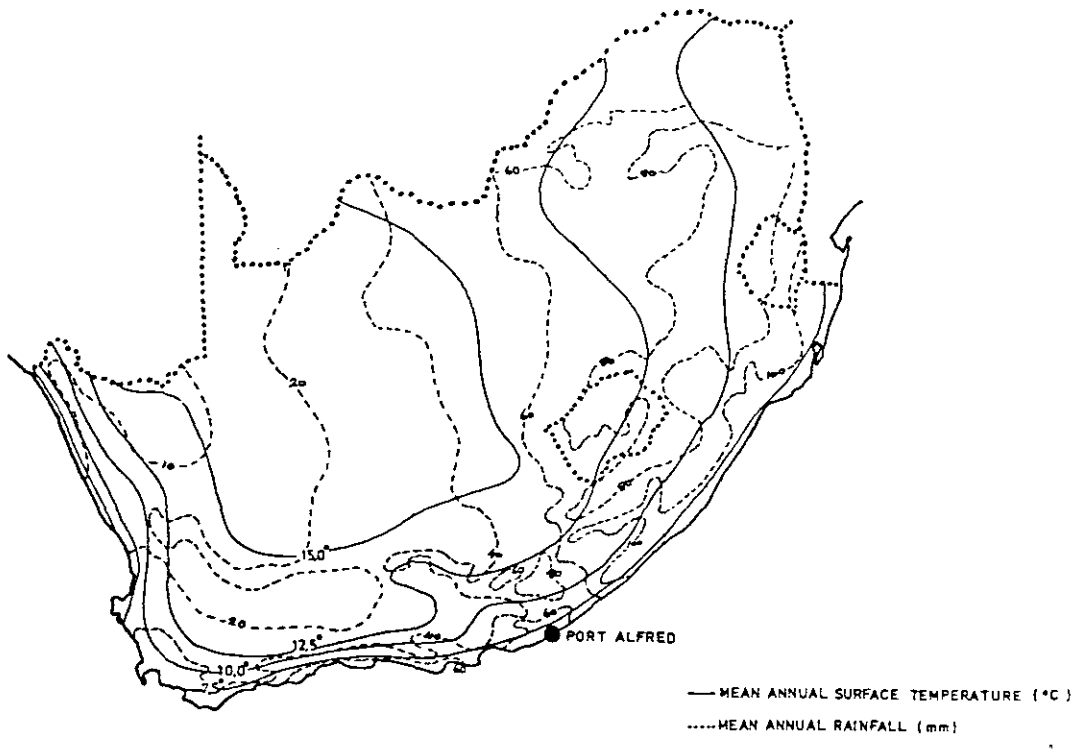
5 - ESTUARINE DEPOSITS WITH LAGOONAL, BEACH & AEOLIAN DEPOSITS

GEOLOGICAL SECTIONS

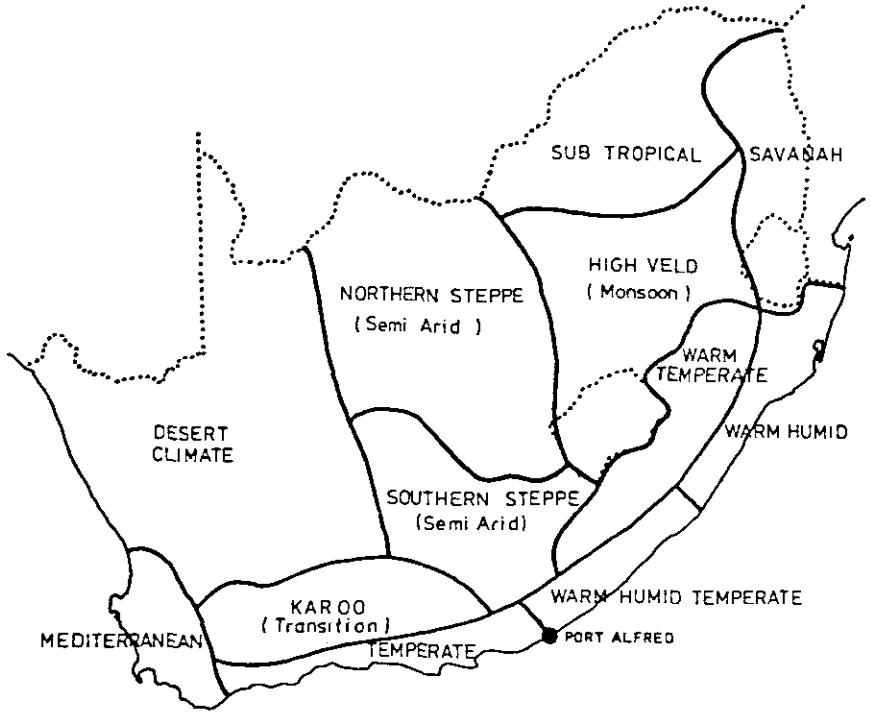
FIGURE 2.4

2.2 CLIMATE

Figure 2.5 refers to the general climatic regions of South Africa and it can be seen that Port Alfred falls between a warm humid temperate and temperate climate which has a particular effect on the rainfall experienced in the area.



TEMPERATURE AND RAINFALL



CLIMATIC REGIONS

KILOMETRE

SOURCE : S.A. WEATHER BUREAU

PORT ALFRED
CLIMATE

FIG 2.5

In general the climate is warm and humid with occasional hot, dry "berg" wind conditions and rain can be expected in all seasons.

2.2.1 PRECIPITATION

Port Alfred is, because of its location between two climatic regions, within the bi-modal rainfall regime adjacent to a band comprising of the winter rainfall areas along the Cape South Coast and the warm humid (tropical / sub-tropical) summer rainfall regions of the Transkei and Natal South Coast.

The area around Port Alfred has a mean annual rainfall of approximately 660 mm but this can vary from as much as 1100 mm to as little as 450 mm from one year to another.

Most of the rainfall occurs during March and September / October with a mean monthly fall of approximately 60 to 65 mm. (See Figure 2.6 -top) Rain can, however, be expected to a lesser degree throughout the year with the dryest spells (mean monthly falls of just over 40 mm) being during December / January and July.

Popularity as a holiday resort is directly related to this rainfall in that the dryest spells fall within the major school holiday periods.

2.2.2 TEMPERATURE

The average maximum and minimum temperatures in the area

for January (main holiday season) which is the warmest month on average are 28 C and 17 C, and 21 C and 8 C during July which is generally the coolest month.

Figure 2.6 indicates the mean monthly temperatures which vary between 21 C and 15 C although temperatures as high as 34 C have been recorded.

2.2.3 WIND

The prevailing Summer wind direction is east-north-east to south-west with seasonal averages of 28,4 km/hr (7,9 m/s) and 24,8 km/hr (6,9 m/s) respectively which can be seen on the Wind Occurrence Roses in Figure 2.7 .

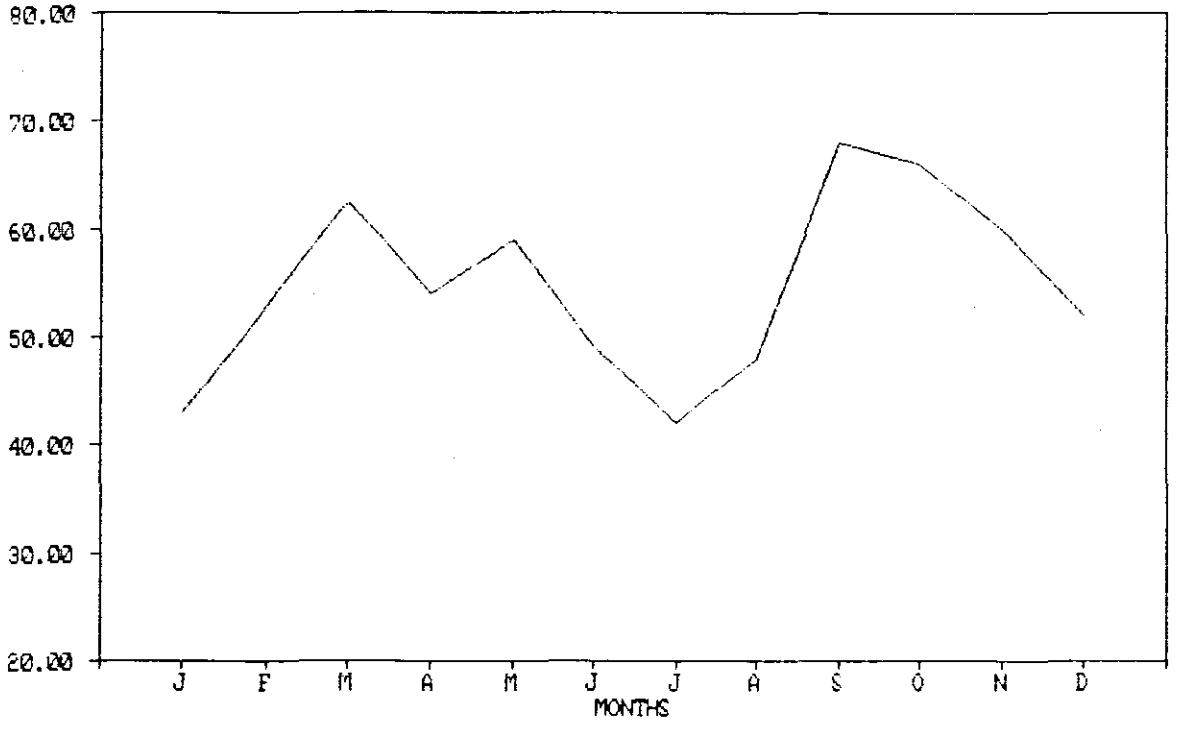
There is, however, a significant increase in the gust velocity during south-westerly blows (the wind blows harder for short periods of time which is not well reflected on the seasonal averages) which appears mainly responsible for dune movement along the western beach.

Winter winds are off-shore, prevailing from the north west, with seasonal averages of 17 km/hr (4.9 m/s) although gusts can become quite strong.

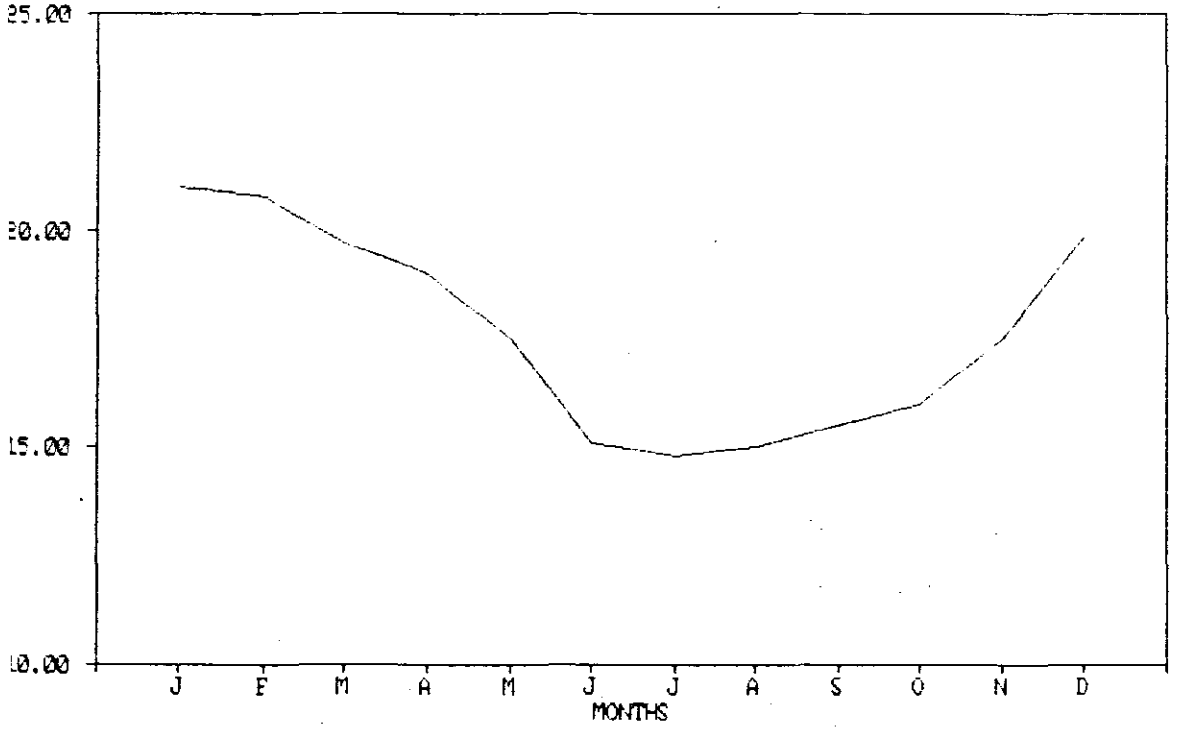
The calmest period is in the Autumn (March to May) with the highest occurrence of short term strong winds in the Spring (September to November).

The section of the town which lies within the ravine is protected to a certain degree from the wind and these areas

MEAN MONTHLY RAINFALL



MEAN MONTHLY TEMPERATURE

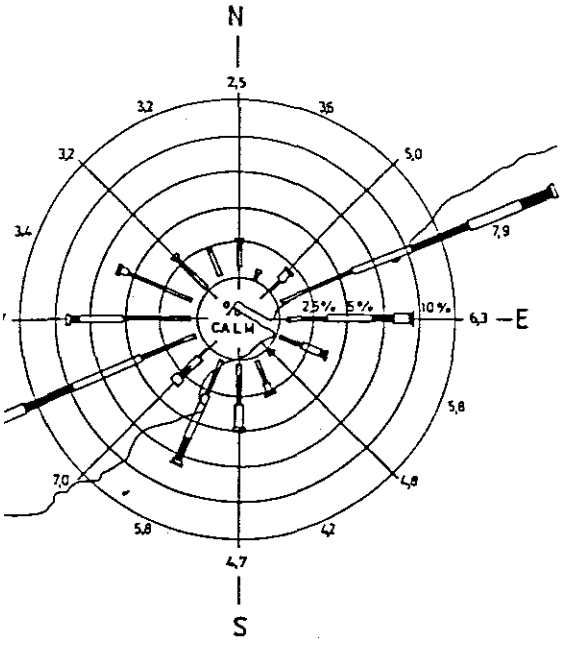


Source : S A WEATHER BUREAU

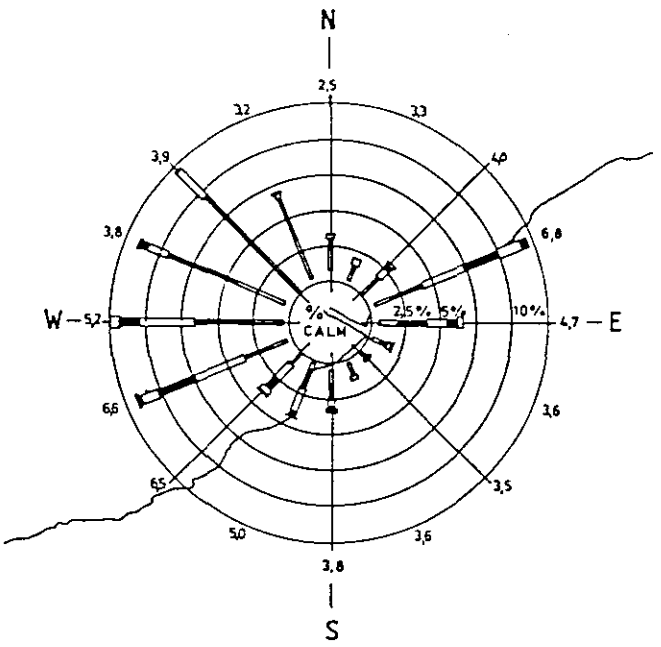
PORT ALFRED

CLIMATE-TEMPERATURE and PRECIPITATION

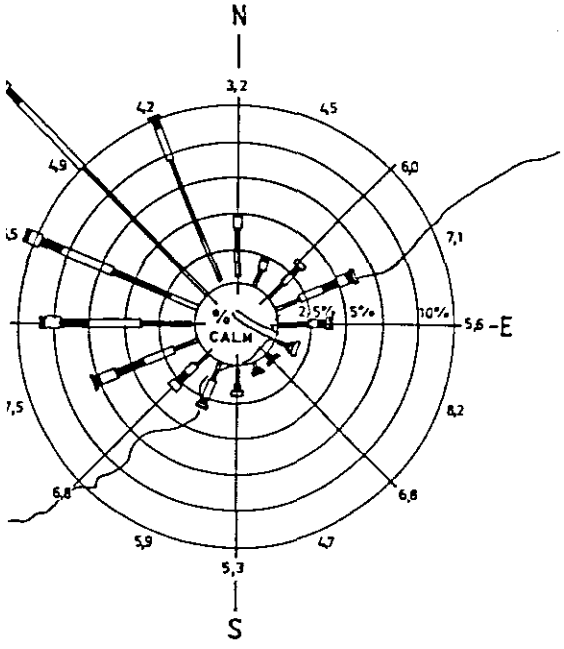
FIG 2.6



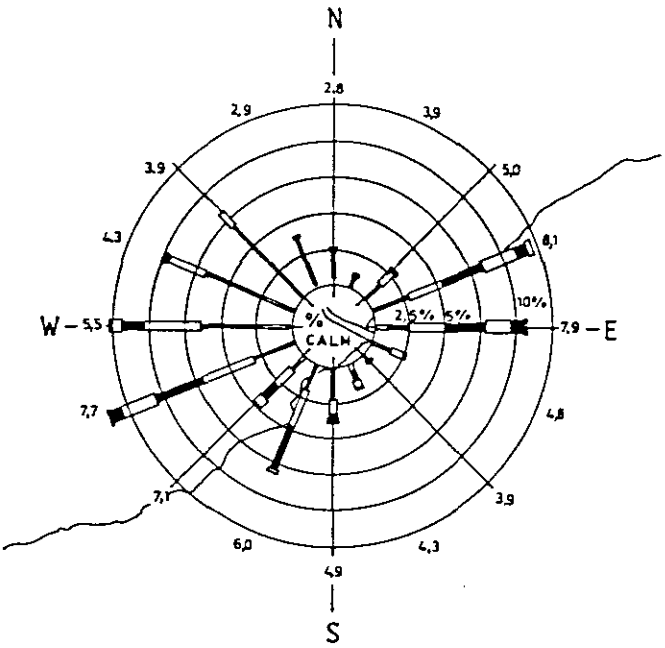
SUMMER



AUTUMN



WINTER



SPRING

SPEED IN M/S

FIGURES AT END OF LINE ARE AVERAGE SPEED IN M/S

0 5,0 7,5 10 13 16 20 <

age = 95%

Period of registration		March '69 - Oct '72	
Gauge type		Lambrecht	
Position	Lo 27	Y= 9629	X = 3 719 238
Height above M.S.L.		95 m	
Height above G.L.		5 m	

SOURCE : DEPT. OF ENVIRONMENT AFFAIRS

PORT ALFRED

WIND OCCURRENCE

FIG 2.7

have a micro-climate which is warmer than the area immediately adjacent to the beach or located on the hills.

2.3 BIOTIC ENVIRONMENT

2.3.1 NATURAL VEGETATION

The natural vegetation of the inland areas is mainly that of large bushes and scrub such as bieto (Crysanthemoides monilifera), wax berry (Myrica cordifolia), dune crowberry (Rhus crenata) and "duinetaaibos" (Passerina rigida).

Indigenous climax trees include Milkwood (Sideroxylon inerme) and wild silver oak (Brachylaena discolor).

The area has been invaded by exotic species such as "rooikrans" (Acacia cyclops) and blue gum (Eucalyptus globulus) which were no doubt introduced by settlers in an attempt to bind the dunes against wind erosion. The "rooikrans" is, however, kept from inundating the area by local wood-cutters in search of fuel.

This area of the east coast is also the natural habitat of the cycad. The two species most commonly encountered are the Encephalartos caffer and Encephalartos princips and can be found along the upper reaches of the river where early farming did not eradicate them. They are now a protected species in South Africa.

Much of the area immediately surrounding the town has been either put under crops or has cultivated non-indigenous

species for domestic gardens and sports grounds.

The primary dune areas are vegetated by species of primary successional grasses such as "sandkweek" (Sporobolus virginikus) and marram grass (Ammophila arenaria) which are able to withstand the extreme mobility of dunes which has prevented other species from establishing.

The secondary dune area which is more stable and has better soil acts as a transition zone from the primary to various herbaceous species.

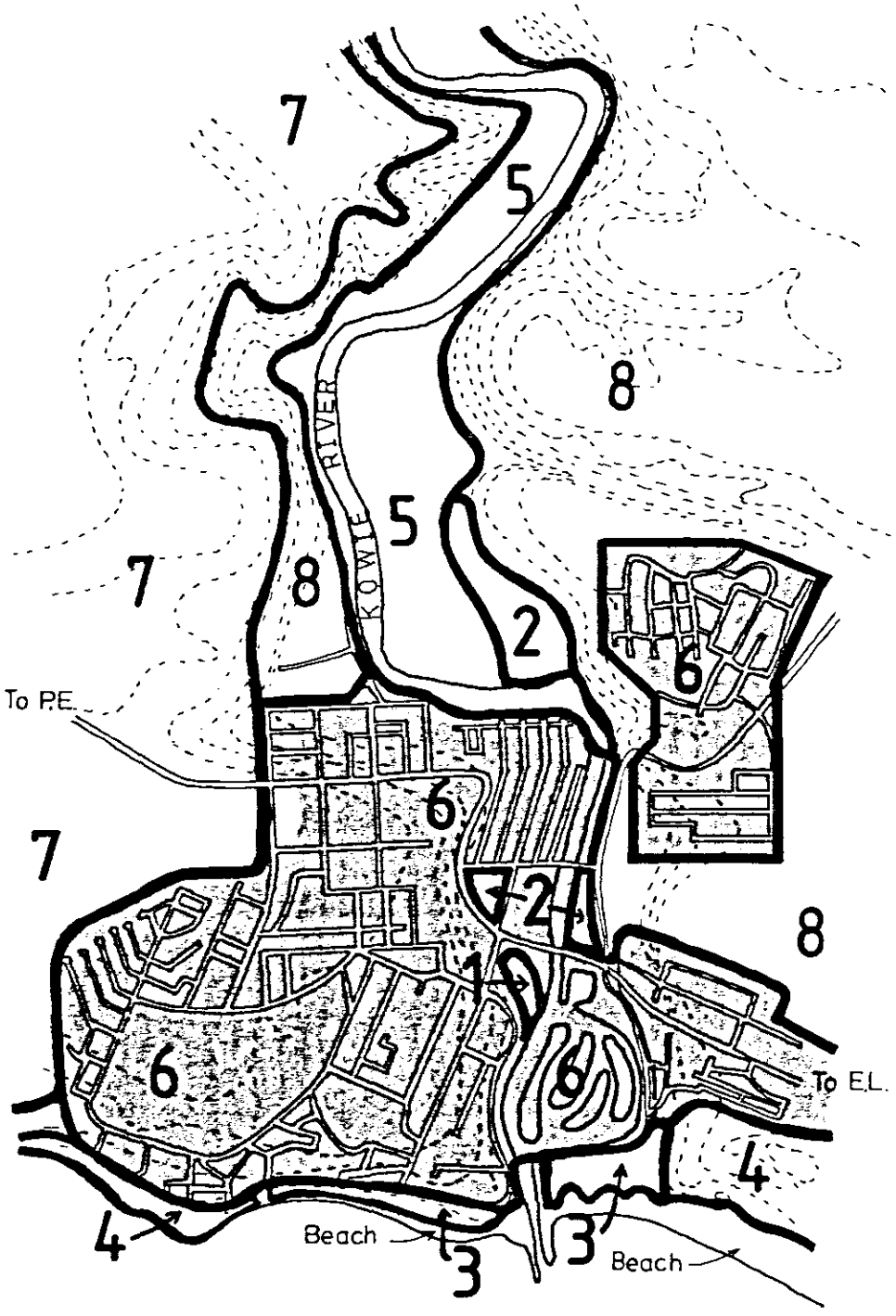
Moving inland the variety of species increases due to better soil and micro-climatic conditions.

The general vegetative quality of the entire area is good and imparts a sense of surrounding greenery. This sense of wilderness increases rapidly when moving upstream from the central part of the town with residences located "within" the vegetative environment rather than being "surrounded" by it.

Environmental quality such as this should at all costs be maintained as it increases both the positive imageability and recreational experiences offered by the town.

A short explanation of the vegetative regimes referred to in Figure 2.8 is given below:

1 Lagoons - algae and submerged macrophytes
2 Marsh & Mudflats - aquatic & semi-aquatic macrophytes
3 Dunes & Driftsand - littoral strand vegetation



1 LAGOONS
2 MARSH & MUDFLATS
3 DUNES & DRIFTSAND
4 STABILISED DUNES
5 RIVER BANKS
6 DEVELOPED AREAS
7 AGRICULTURE
8 BUSH

PORT ALFRED
VEGETATION

FIG 2,8

4 Stabilised dunes	-	coastal scrub or thicket
5 River banks	-	succulent riverine thicket
6 Developed areas	-	exotic species
7 Agriculture	-	cash and food crops
8 Bush	-	indigenous bush and veld species

2.3.2 BENTHIC FAUNA

The table overleaf shows the occurrence of the structure and distribution of the bottom living macro-invertebrate fauna of the Kowie estuary and associated wetlands.

It is these organisms which provide the lower levels of the estuarine food chain and further indiscriminate development of river-related activities could seriously jeopardise their continued survival.

2.3.3 FISH

The most productive areas of the estuary are it's salt marshes and mudflats.

By channelising the mouth area during the 19th century the major and most important salt marshes, those which originally formed the Blue Lagoon, Upper and Lower East Bank Lagoons, had been effectively eliminated from contributing to the overall productivity of the estuary.

These salt marsh areas are most important nursery areas to juvenile fish because of their high natural productivity and abundance of food. Until 1986 these marshes were removed from production but with the construction of the

TAXA	MAIN RIVER				TIDAL LAGOONS			NON TIDAL LAGOONS		
	RS	MR	M	Sp	M	Sa	Sp	M	Sa	Sp
Sponges	C	C								
Coelenterata										
Hydrozoa		C	C		C			C		
Anthozoa	P	P				C			C	
Flatworms	P									
Annelida										
Errantia	P									
Sedentaria		A	A				A	A	P	
Mollusca										
Amphineura	C									
Gastropoda	C	C	C	A			A	C		C
Bivalves	C		A		C	P		P		
Cephalopoda	C	C	C							
Crustacea										
Isopoda	C	P	P		C	P		P	P	P
Amphipoda	C	C	P	P	C	A	P	C	A	P
Barnacles	A	C								
Decapoda										
Prawns		A								
Crabs	C	C	A	A				C	P	C
Echinodermata										
Brittlestars	C	P								
Sea-Urchins	C	C								
Protochordata										
Tunica	C	C								

RS = Rocky shore; MR = mudflats with rocks; M = mudflats; Sa = sand; Sp = Spatina mud.

A = Abundant C = Common P = Present

BENTHIC FAUNA

Source: Plan Assoc.- Port Alfred EIA 1986

TABLE 2.1

Royal Alfred Marina the Blue Lagoon was once again opened to the full influence of the tide and being located near the mouth will act as an important breeding ground. The conditions for fish breeding were further enhanced when the developers decided to incorporate a recommendation to

"stone-pack" the edges of the artificial islands instead of the original plan to cement "gunite" them to a smooth finish. (Port Alfred EIA - Plan Associates 1986) In doing this, a rougher submerged surface was provided which is very conducive to breeding fish.

There are approximately 100 species of fish which populate the estuary and these can be divided into six categories namely :

Species totally dependent on estuaries;

- throughout their entire life cycle
- during the larva and juvenile phases
- during the juvenile phases but also found in the sea

Species partially dependant on estuaries

- for nurserine areas

Independant species

- straying into estuaries
- miscellaneous

In considering the possible influence of further development on the ecology of the estuary, the first three categories above are of particular importance.

The various species of deep sea and reef fish are illustrated in Figure 4.5 .

2.3.4 AVIFAUNA

Although a large number of birds inhabit the Kowie estuary no check list of exact total numbers exists. It is,

however, estimated that approximately 200 species inhabit the area of which 130 use it as a breeding ground. Six of the species which inhabit the estuary have been listed as requiring conservation. (Siegfried et al, 1976)

Bird counts carried out over two days in 1979 yielded some 35 species with a total of 707 individual birds being spotted (Underhill et al 1980).

The six broad habitat categories are shown in Figure 2.9.

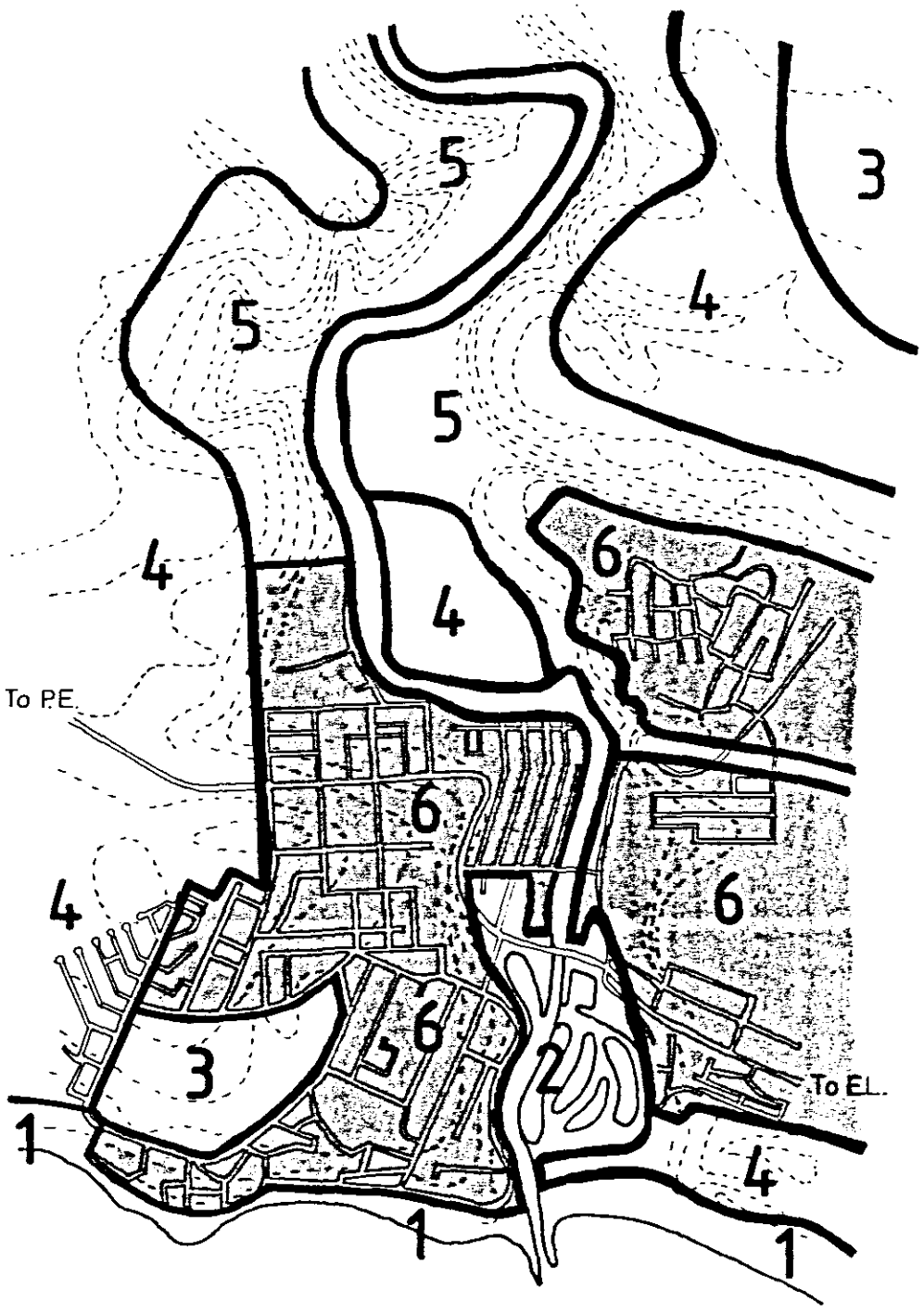
2.4 POLLUTION EFFECTS

Pollution of some or other kind can nearly always be attributed to human habitation of an area over and above natural pollution such as volcanic gas and dust.

Unfortunately, pollution caused by human activity is seldom as easily assimilated by the environment as that produced by natural causes.

From the above it is a natural assumption that without effective preventative measures the occurrence of pollution will escalate with an increase in human habitation or activity.

It is therefore important that levels of pollution in the Port Alfred area are monitored and, if necessary, strictly controlled if the area is to retain its natural environment. It is felt, however, that only pollution sources which effect the quality of the river and



1 SEA SHORE
2 RIVERS & ESTUARIES
3 GRASSLAND
4 BUSH
5 FOREST
6 URBAN

PORT ALFRED
BIRD HABITATS

FIG 2.9

subterranean water resources as well as noise are relevant and therefore inductal sources, such as dust and noxious gases are not addressed.

The various aspects of pollution sources and their likely levels of occurrence are discussed below.

2.4.1 NUTRIENTS

No data on nutrient levels in the Kowie estuary are available. (CSIR Research Report 409, 1982, Page 24)

It is to be expected that these would be slightly elevated due to enrichment from agricultural lands in the catchment area, although no visual signs such as algal blooms in the main river are apparent.

2.4.2 HEAVY METALS

Elevated levels of heavy metals, which are a general indicator of human activities, are not found in the Kowie at present. Those that are present are of natural origin and in a stable chemical form.

It is, however, expected that higher levels of metals such as lead might become apparent in the future if the Royal Alfred Marina causes a significant increase in boating activity. Lead contained in the exhaust gases which are normally released below the surface can assimilate with the water and thereby build up in the flesh of fish found in the estuary. This build-up, although not necessarily

affecting the fish, can reach levels which become dangerous if consumed by humans.

2.4.3 MICROBIOLOGICAL

Levels of Escherechia coli bacteria, which are used as an indicator of faecal pollution should be monitored. E coli and bacterial concentrations are strongly elevated after heavy rain. These accumulate in the filter feeders, particularly shell fish, to the potential detriment of a human consumer.

Port Alfred has only recently commenced with a programme to install waterborne sewerage to all the White residential areas which was a requirement for the Royal Alfred Marina.

The present septic tank usage (through possible leakage) and the lack of a sewerage system in the Black township causes leaching of these bacteria to lower ground, in this case the river.

High levels of E coli had been suspected in the Blue Lagoon (where the marina was constructed) by local doctors who often treated children who had been swimming there for eye infections.

These elevated levels can be attributed to leaching from the higher ground of the the Black township and will most probably continue to enter the marina site, the canals of which are below the natural water table. Concentrations will be lowered due to the tidal flushing of the marina

canals.

2.4.4 TRACE ORGANIC COMPOUNDS

These include normal pesticides, herbicides, industrial chemicals and hydro-carbons.

No data is available on the levels of these compounds but if applied correctly pesticides and herbicides are rapidly broken down and their toxicity is of short duration.

Numerous fish kills have occurred in the river and this has been attributed to cattle dip having entered the river. (CSIR - 1982)

Pineapple farmers in the area do, however, use Dieldrin under special licence but no appreciable levels of this chemical have been monitored in the river.

It is not foreseen that levels of trace organic compounds will increase in the area although pesticides used in the domestic gardens of the marina could easily be carried into the water with runoff. This is not seen to be of high consequence as the canals of the marina are thoroughly flushed by tidal action.

Levels of hydro-carbons could become elevated through increased use of marine engines which exhaust below the water surface and allow for the combination of these molecules with that of the water.

2.4.5 RUNOFF

Storm water runoff from built-up areas can carry a variety of contaminants into the river. The principle concern here is lead (from motor exhausts), particulates, oil and associated materials which would come from parking areas, roads and treated timber.

Agricultural nutrients and biocides may also be included in garden runoff and it is expected that these will be deposited into the canals of the marina from all the waterfront gardens. Here again, however, their significance is seen to be small because of the tidal flushing but should garden fertilisers containing high levels of nitrogen become deposited in slack water areas eutrification and algal blooms could occur.

Careful consideration should be given to the obstruction of natural water courses before permitting urban growth to occur in the catchment areas to the west of the upper river.

2.4.6 NOISE

Major sources of noise within the urban environment are motor vehicles and outboard engines.

High levels of motor vehicle noise are mainly confined to the areas adjacent to the R72 road and are further increased at the approach sections either side of the river where severe gradients are encountered. Heavy vehicles are

the major source here and only the reduction of gradient or the restriction of vehicles exceeding a certain tonnage will reduce the effect.

The areas adjacent to the river bank experience high noise levels caused by passing motorboats. Control over the number of vessels and speed will need to be considered to maintain acceptable noise levels in this area.

The location of the airfield and the low frequency of air traffic is such that noise pollution from aircraft is not considered to be detrimental.

2.4.7 FUTURE IMPACTS

As mentioned at the outset (2.4) escalations in the levels of pollution can be expected if the population of Port Alfred increases.

The main sources for concern are as follows:

An increase in the number of residential erven along the banks of the Kowie, particularly the upper catchments, and the marina canals can cause a higher level of runoff in that the percentage of impervious surfaces will increase (these include surfaces such as roads, paved driveways and dwelling roofs which unlike natural surfaces do not allow the percolation of water into their surfaces) causing more free flowing water to reach the river water. This water has a high probability of carrying with it oil particles, nitrogen fertilisers and other organic compounds.

River-side living will also increase the number of active boats in the river causing pollution from exhausts in the form of lead, hydro-carbons, carbon monoxide and increased levels of noise pollution.

A further source of concern is the rapidly increasing population resident in the Black township above the river.

The White residential areas make use of septic tank sewerage disposal but no provision is made for the Black township.

An increase in the leaching of E.coli, pathogenic organisms and industrial chemical waste into the ground water and the river could be severely detrimental to the estuaries' ecosystem and it therefore appears that the provision of sewerage disposal services to the Black township may become a priority within the next decade.

3

THE SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

3.1 NATIONAL SIGNIFICANCE

Port Alfred is situated approximately half way between Port Elizabeth and East London (33 26 00 S, 26 54 00 E) on the south eastern coast of Southern Africa on the estuary of the Kowie River (Figure 3.3).

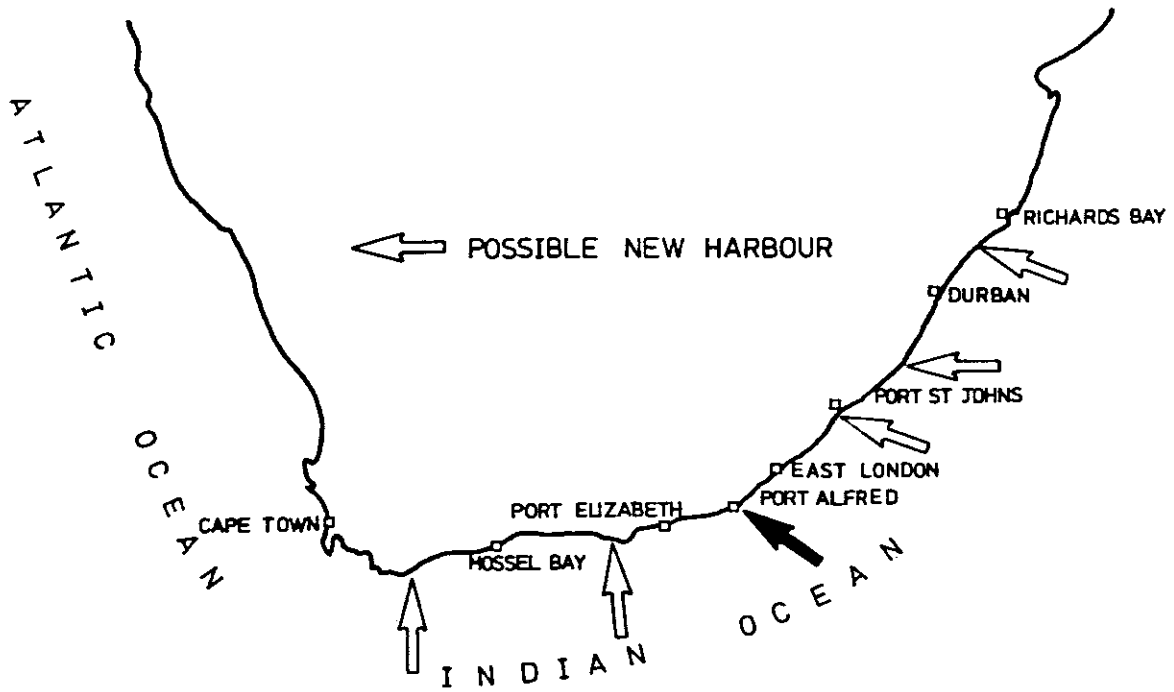
The town is one of some 200 major holiday resort towns along the South African coast and attracts approximately 29 000 to 33 000 visitors annually.

The growing population of the Pretoria, Witwatersrand, Vereeniging (PWV) area has for some years put pressure on the holiday accommodation of the Natal South Coast and it is foreseen that Port Alfred with it's newly completed marina, clean beaches and scenic environment will become a viable alternative.

An evaluation of "Small Craft Facilities Along the South African Coast" (Retief G de F et al, 1986) carried out for the Department of Environment Affairs indicated in it's Preliminary Interpretation of the data presented (Figure 3.1) that Port Alfred was high on the priority list of "Possible New Harbours".

This interpretation was based on need and desirability,

safety considerations and development constraints.



SMALL CRAFT HARBOUR REQUIREMENTS

(Source: Small Craft Facilities Along The S.A. Coast)

FIGURE 3.1

This has led to a study being undertaken by the Cape Provincial Administration into the feasibility of extending the entrance breakwaters of the Kowie to allow all-weather access. (This is discussed in more detail in Section 2 of of this report.)

The importance of all-weather harbours along the South African coast is further emphasised when considering the sub-continent's position in the southern ocean with respect to storm conditions. The international sailing fraternity will make extensive use of high standard harbour facilities

and it is argued that both Plettenberg Bay and Port Alfred could become extensive earners of foreign currency and that the potential for foreign investment would be greatly increased.

This has already become apparent in Port Alfred with the sale of 24 plots in the Royal Alfred Marina to buyers from the United Kingdom and Switzerland. (Cape Times - 15-10-88)

The opening of an aircrew training school at the Port Alfred airfield February 1989 has further increased the significance of Port Alfred as a town.

The construction of the Sun International hotel (Figure 3.2) and casino complex on the Ciskei bank of the Fish River will attract both local and overseas tourists to the area. It can be readily assumed that many will seek accommodation in Port Alfred because of the short 28 kilometre distance to the casino. This has been the case in Port Edward which is similarly situated in relation to the Wild Coast Sun in the Transkei. The owners of the hotel have also negotiated the use of the Port Alfred airfield as air terminus for guests which will further increase traffic to the town.

3.2 REGIONAL SIGNIFICANCE

Port Alfred is situated in the Bathurst magisterial district and is included in the Sub-Regional Structure Plan for the coastal area between the Gamtoos and Great Fish

Rivers prepared by the Cape Provincial Administration. (Figure 3.3)

This plan does not identify any new nodes of coastal development between the Coega and Great Fish rivers, therefore assuming that growth will take place at established towns.

FISH RIVER SUN HOTEL COMPLEX

FIGURE 3.2

Port Alfred ranks amongst the highest in the hierarchy of coastal towns in this region (excluding Metropolitan Port Elizabeth) and can be considered to have a high development potential within the already established urban area when considering the number of vacant, available erven. (Table 3.1) The new marina development could be seen as a catalyst

for future development.

TOWN	ERVEN	DEV.ERVEN	% DEV.	% of TOT. ERVEN
Fort D'Acre	349	0	0	3.5
Seafield	209	82	39	2.1
Island Beach	302	9	3	3.0
Port Alfred *	3 000 *	1 037 *	34 *	30.7 *
Kasouga	91	74	81	.9
Kenton-on-Sea	1 500	795	53	15.3
Bushmans River	873	471	54	8.9
Boknesstrand	551	185	34	5.7
Cannon Rocks	486	79	16	4.9
Colchester	522	55	11	5.3
Cannonville	116	88	76	1.2
St Georges Strand	369	36	10	3.9
Blue Water Bay	172	114	66	1.7
Schoenmakerskop	95	87	91	.9
Kini Bay	96	39	41	1.0
Clarendon Marine	457	114	25	4.7
Beach View	233	32	14	2.4
Blue Horizon Bay	382	40	10	3.9
TOTAL	9803	3337	34 %	100 %

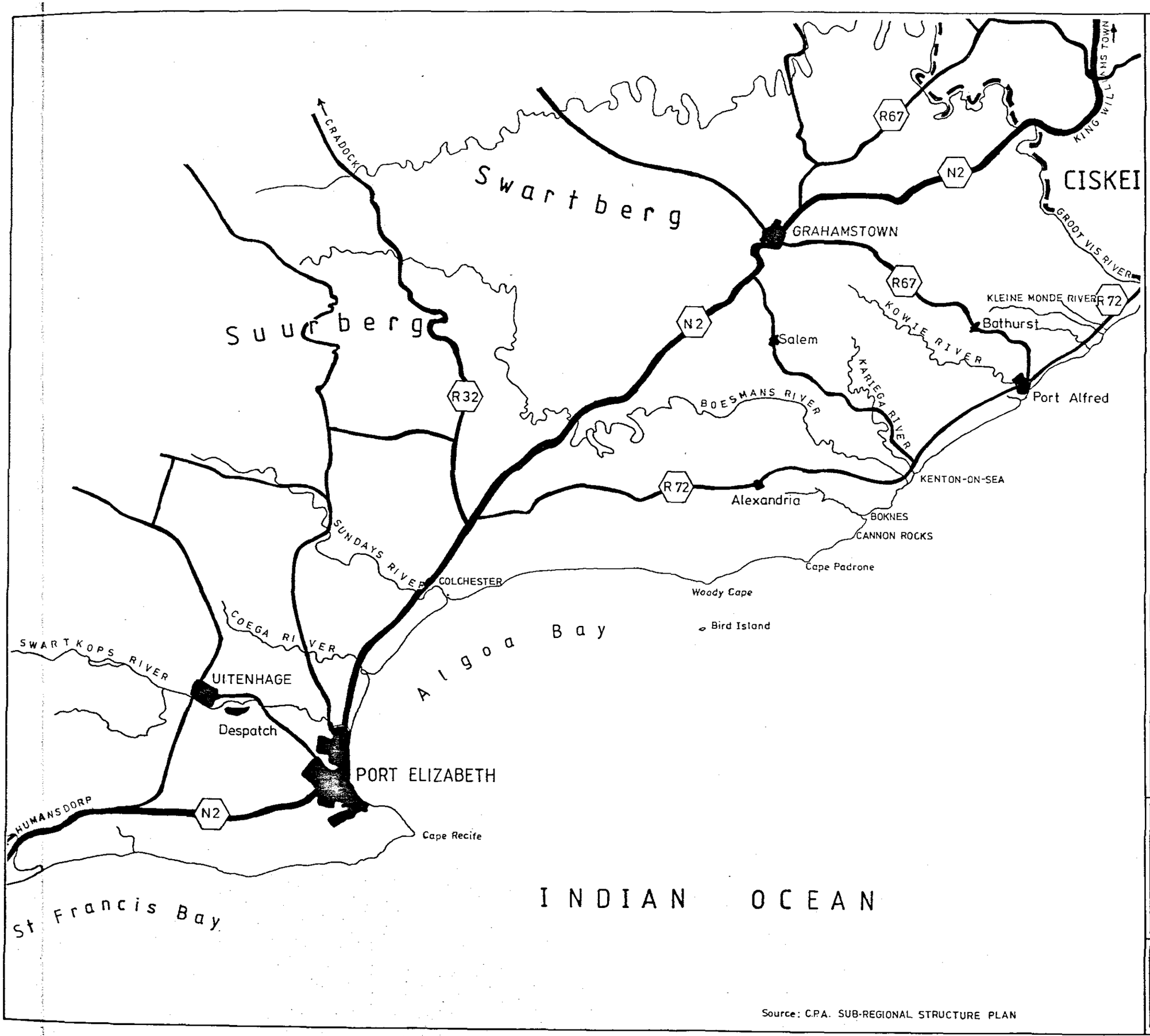
AVAILABLE AND DEVELOPED ERVEN

TABLE 3.1

The R72 coastal road which crosses the Kowie River over the Nico Malan bridge passes between the central business district of Port Alfred and the popular vacation areas such as the beach.

The large volume of traffic carried on this road forms a barrier and constitutes a safety hazard for pedestrians. The bridge is built in such a way that continuous access along the river bank is obstructed.

The advantage of this road to the town, however, is enormous when considering it's central location between the two metropoles.



LEGEND

- TRUNK ROAD
- MAIN ROAD
- ROUTE
- RIVER
- BOUNDARY
- URBAN AREA

0 10 20 30 40
Km
SCALE

PORT ALFRED
REGIONAL LOCATION

FIG 3.3

Source: C.P.A. SUB-REGIONAL STRUCTURE PLAN

Considering Port Alfred's position in the hierarchy of coastal towns of the region, by population size and spatial extent of urban development, it is obviously the largest magnet for tourist and holiday accommodation.

The whole of this region has a unique scenic environment and stretches of unspoilt beach. Port Alfred is well located in relation to several protected natural areas. (Table 3.2)

CONSERVATION AREA	CONTROLLING BODY	AREA OF NATURAL VELD (HA)	VELD TYPE
Tharfield N.R	PRT	342	2
Alexandria S.F	FOR	23 553	2,70
St Croix	CPA	20	
Brenton			
Jahleel I.R's			
Cape Recife N.R	PEM	336	47
Sardinia Bay N.R	PEM	320	47
Sylvic N.R	ALGOA	78	47
The Island S.R	FOR	223	2
Maitland mines N.R	ALGOA	127	

PRT = Private
FOR = Forestry Directorate
CPA = Cape Provincial Administration
PEM = Port Elizabeth Municipality
ALGOA = Algoa Regional Services Council

NR = Nature Reserve
SF = State Forest
IR = Island Reserve

VELD TYPE: Adcocks, J.P.H.,Veld Types of South Africa, 1975

NATURE AND FOREST RESERVES

TABLE 3.2

3.3 ECONOMY

Port Alfred is today still intimately linked to the sea via it's commercial fishing interests, while the river provides

Considering Port Alfred's position in the hierarchy of coastal towns of the region, by population size and spatial extent of urban development, it is obviously the largest magnet for tourist and holiday accommodation.

The whole of this region has a unique scenic environment and stretches of unspoilt beach. Port Alfred is well located in relation to several protected natural areas. (Table 3.2)

CONSERVATION AREA	CONTROLLING BODY	AREA OF NATURAL VELD (HA)	VELD TYPE
Tharfield N.R	PRT	342	2
Alexandria S.F	FOR	23 553	2,70
St Croix	CPA	20	
Brenton			
Jahleel I.R's			
Cape Recife N.R	PEM	336	47
Sardinia Bay N.R	PEM	320	47
Sylvic N.R	ALGOA	78	47
The Island S.R	FOR	223	2
Maitland mines N.R	ALGOA	127	

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NATURE AND FOREST RESERVES

TABLE 3.2

3.3 ECONOMY

Port Alfred is today still intimately linked to the sea via it's commercial fishing interests, while the river provides

scenic beauty and recreation for retired people and scores of holiday makers.

It is this holiday trade which forms the economic base of the town.

The seasonal influx of holiday makers is approximately 12000 - 14000 people in December, 10000-12000 in April and 7000 in June.

Holiday accommodation is extensive, with three one- and two- star hotels, first class caravan and camping sites and holiday flats which can be purchased, rented or occupied on a time-share basis.

Of the total of 819 camping stands for the White population group available within the coastal sub-region (Sundays River to Great Fish River) Port Alfred provides 218 (some 26%).

RESORTS	NO. STANDS
Port Alfred	218
Boesmansrivier	60
Boknesstrand	34
Cannon Rocks	97
Colchester	142
Noordhoek	100
The Willows	64
Beachview	104
TOTAL	819

CAMPING SITES

TABLE 3.3

The fishing industry of Port Alfred permanently employs some 160 fisherman, and associated workers and has an invested capital in excess of 1 million Rand.

Table 3.4 gives an estimate of the financial turnover created by this industry. These figures would, however, be greatly increased if the river entrance were navigable in most weather conditions.

At present the industry supports 16 White and 160 Black families.

Annual Bait Sales	:			R 160 000
Fuel use	:			R 205 000
Maintenance	:			R 14 000
Average Fish Catches	:	1982	-	82 tons
		1983	-	171 tons
		1984	-	168 tons
		1985	-	231 tons
Landed Values	:	1985	-	R 246 100
		1986	-	R 326 000

FISHING INDUSTRY TURNOVER

TABLE 3.4

This industry alone earned 1,75 million Rand in the 1986/1987 financial year by landing approximately 500 tons of line fish and squid (average price of R 0,35 per kg).

The main retail business sector of Port Alfred is located along Main Street.

The Table overleaf indicates employment statistics for 1983 and gives an indication of the population / employment ratios and worker densities. It must be noted that the

fishing industry which does not require any substantial or fixed work place is not included in this Table.

SECTOR	EMPLOYMENT							SPACE		
	WHITE		COLOURED		BLACK			FLOOR AREA	SITE AREA	FLOOR AREA
	M	F	M	F	M	F	TOT	m^2	ha	m^2/work
PUBLIC OFF.	54	33	5	1	44	14	151	6252	-	41,4
PRIVATE OFF.	14	33	-	-	3	3	53	710	0,2	13,4
TRADE	55	93	3	20	54	62	287	9574	1,8	33,4
LIGHT IND.	46	9	28	-	178	6	267	7097	4,3	26,5
SERVICE IND.	17	7	23	-	66	1	114	1185	1,6	10,4
MOTOR TRADE	25	7	4	-	44	4	84	1988	1,1	23,7
ACCOMMODATION	16	24	3	10	38	121	212	-	11,5	-
OTHER	24	38	-	8	65	85	220	-	-	-
TOTAL	251	224	66	39	492	296	1388	26808	20,5	

EMPLOYMENT

TABLE 3.5

The turnover of these businesses is extremely difficult to determine considering that they are usually incorporated in figures which include businesses of a professional nature.

The business sector of Port Alfred occupied sites the rateable value of which in the 1987/88 financial year was estimated at a total of R 4 266 360 (R 1 210 870 for the sites and R 3 055 490 for buildings). This is approximately 10,7 % of the total amount of revenue obtained from rateable properties in the town.

3.4 SOCIOLOGY

Port Alfred's White population is on the whole a relatively

affluent one with many retired business persons who are financially independent.

This population is, however, only approximately 17% of the total although it is largely responsible for the social activities of the town. The fact that more than 40% of the white population is over the age of 60 years probably accounts for the well-appointed recreational activities in the town.

The Black population which accounts for some 72% of the greater Port Alfred area is, however, not so well off with over 60% of this sector of the population economically inactive mainly due to unemployment.

Facilities for this sector of the population are also sorely lacking as is the case in most of the Eastern Province.

This has led to the social problems of alcoholism, crime and a general apathy with regards to social upliftment.

3.5 DEMOGRAPHY

The population of Port Alfred displays a fundamental inequality in terms of income levels with much of the wealth and political authority being held by the minority.

3.5.1 PRESENT POPULATION

Population statistics for Port Alfred as given in the 1985 census data released by Central Statistical Services

indicate a White population of 2455 persons with the Coloured and Black groups as 845 and 7725 respectively. Figure 3.4 refers to the White cohort distribution and, as can be seen, a large proportion of that group falls into the age groups older than 55 years.

Figure 3.5 shows a relatively young Coloured population although in refering to the lower cohorts it can be seen that the rate of growth has begun to stabilise.

The Black population is also concentrated in the younger cohorts (Figure 3.6) and here also growth appears to be stabilising.

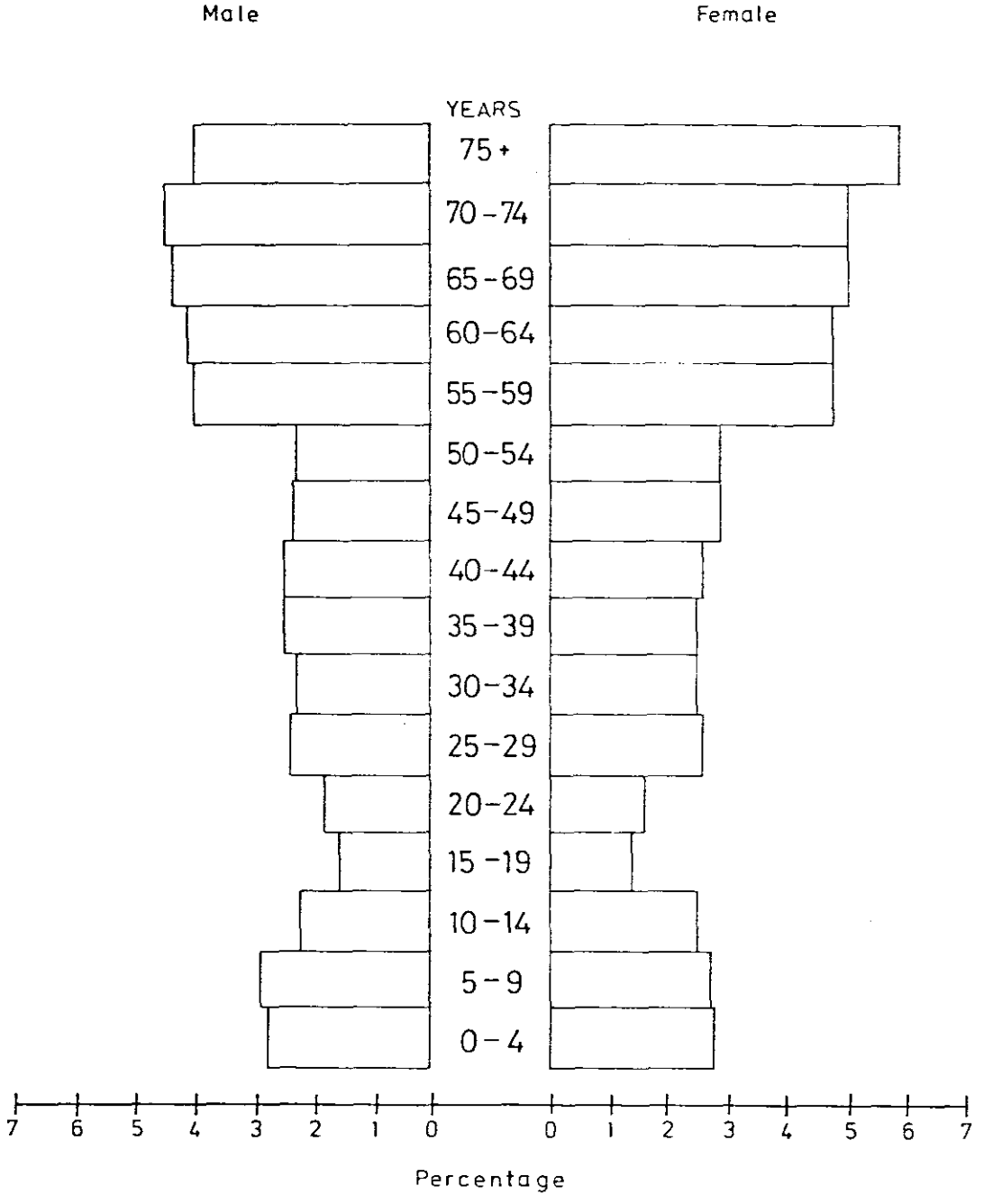
Figures 3.7, 3.8 and 3.9 give an indication of the occupations and education levels of the various population groups.

3.5.2 TRENDS

In considering a development strategy for a region or for a town such as Port Alfred it is important to establish the expected growth in population in order to quantify the future spatial requirements.

Figure 3.10 has been prepared using data supplied by Central Statistical Services and represents population growth during the period 1960 to 1985.

From the research carried out it became apparent that several previous reports dealing with different aspects of

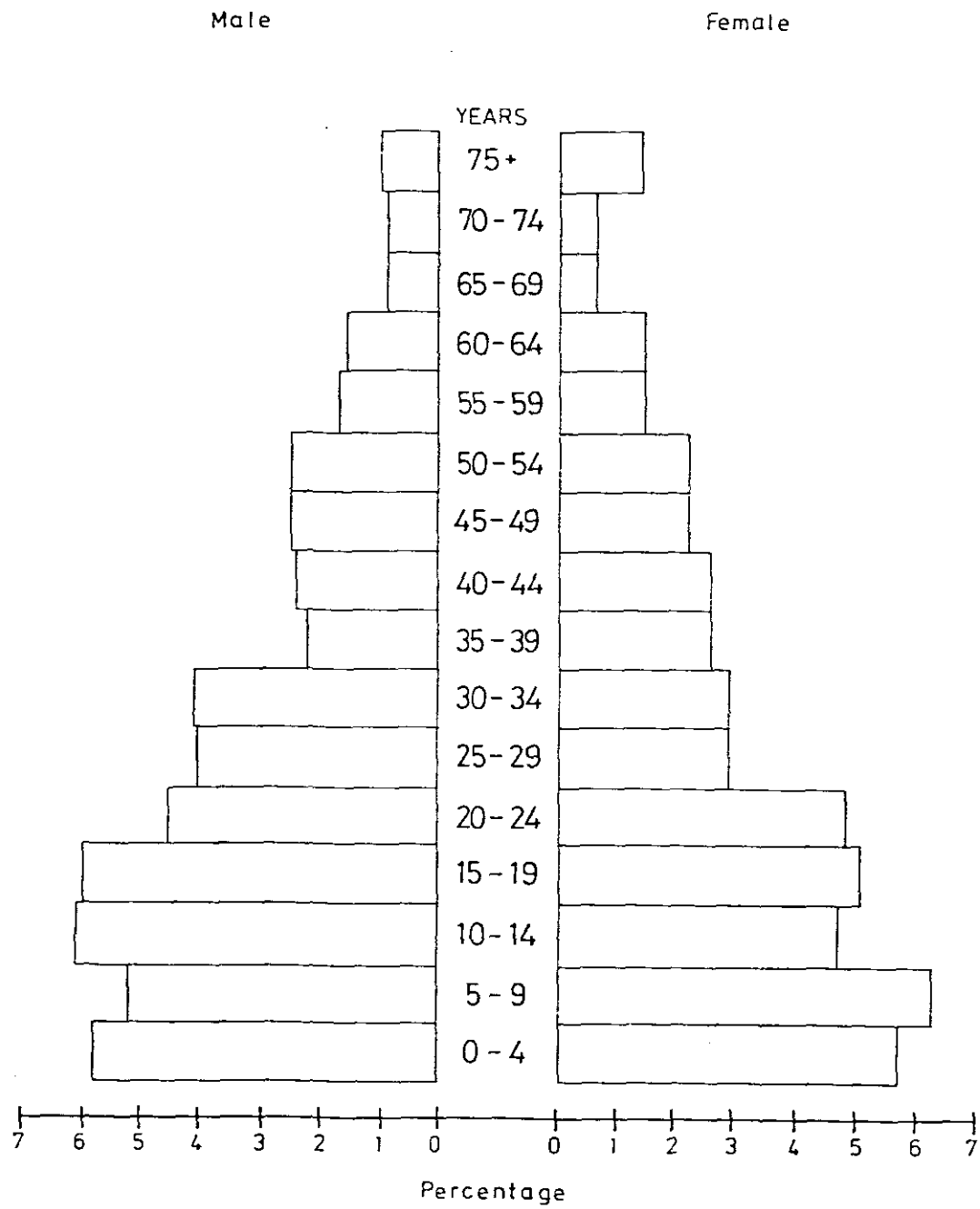


Source: POPULATION CENSUS 1985

PORT ALFRED

AGE DISTRIBUTION - WHITE

FIG 3.4

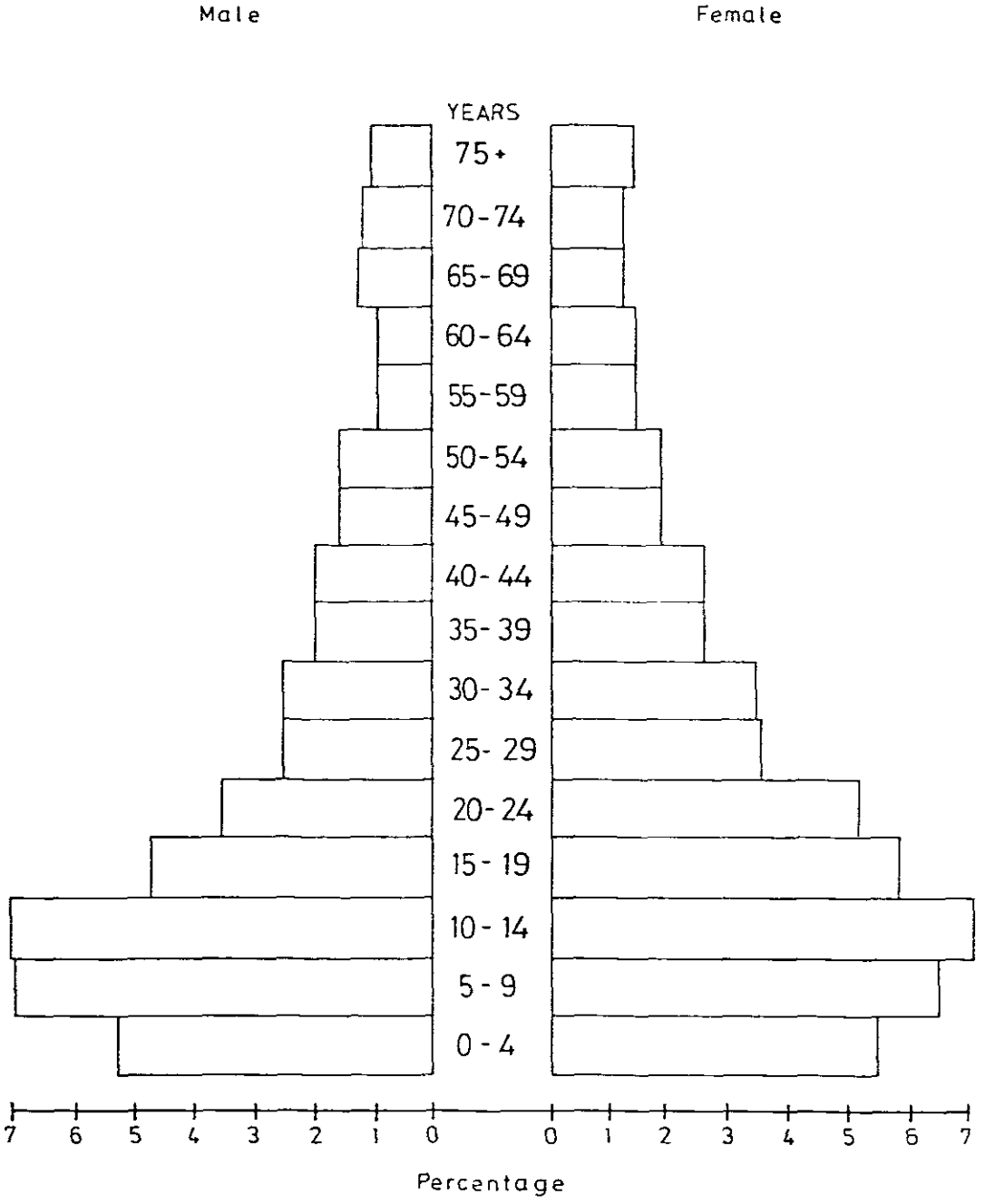


Source: POPULATION CENSUS 1985

PORT ALFRED

AGE DISTRIBUTION - COLOURED

FIG 3.5

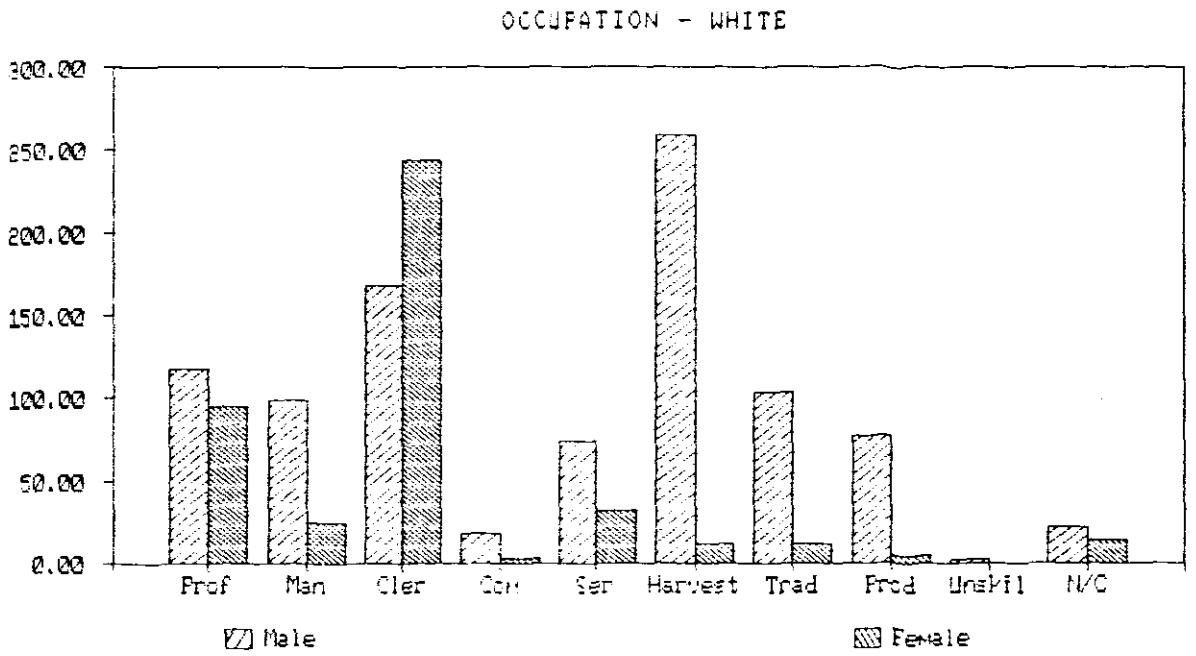


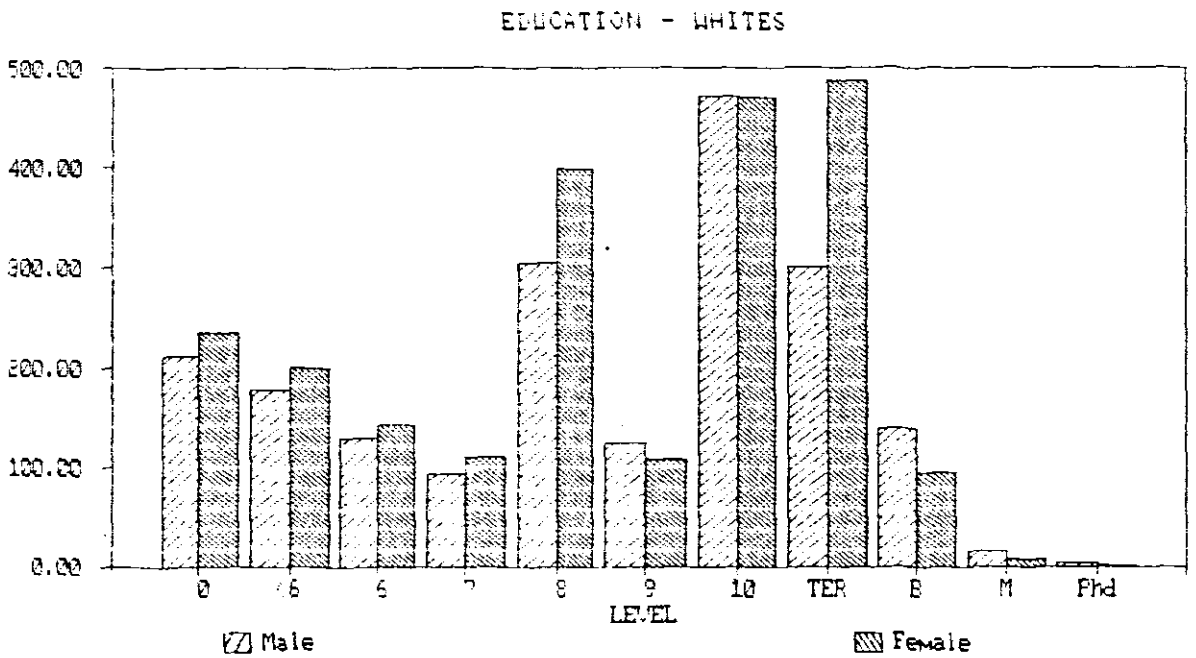
Source : POPULATION CENSUS 1985

PORT ALFRED

AGE DISTRIBUTION - BLACK

FIG 3.6





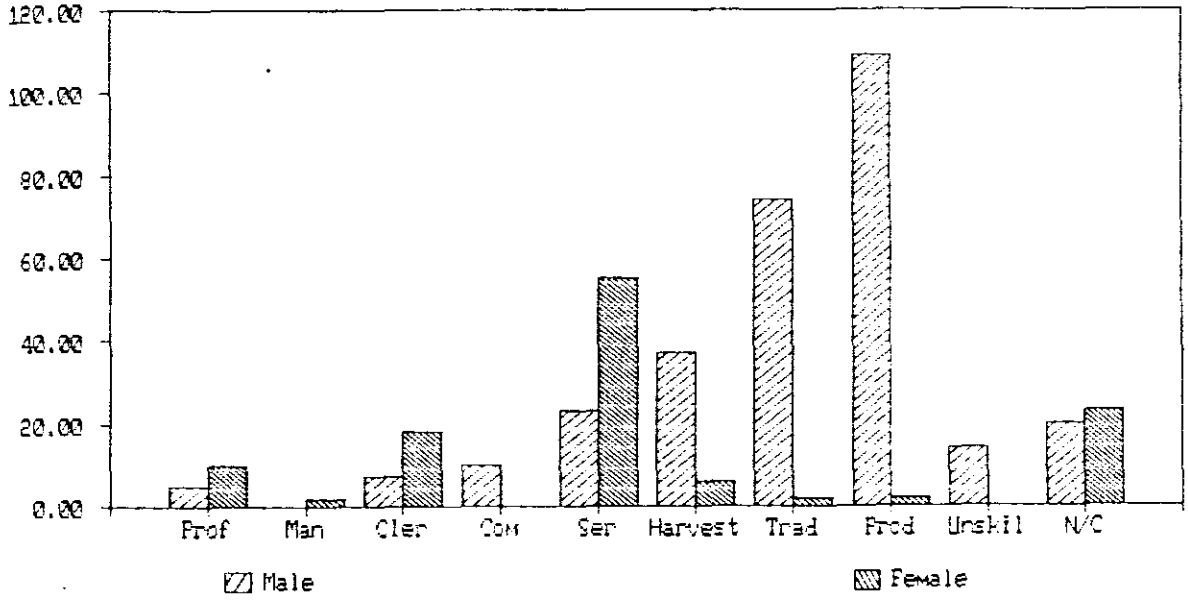
Source: POPULATION CENSUS 1985

PORT ALFRED

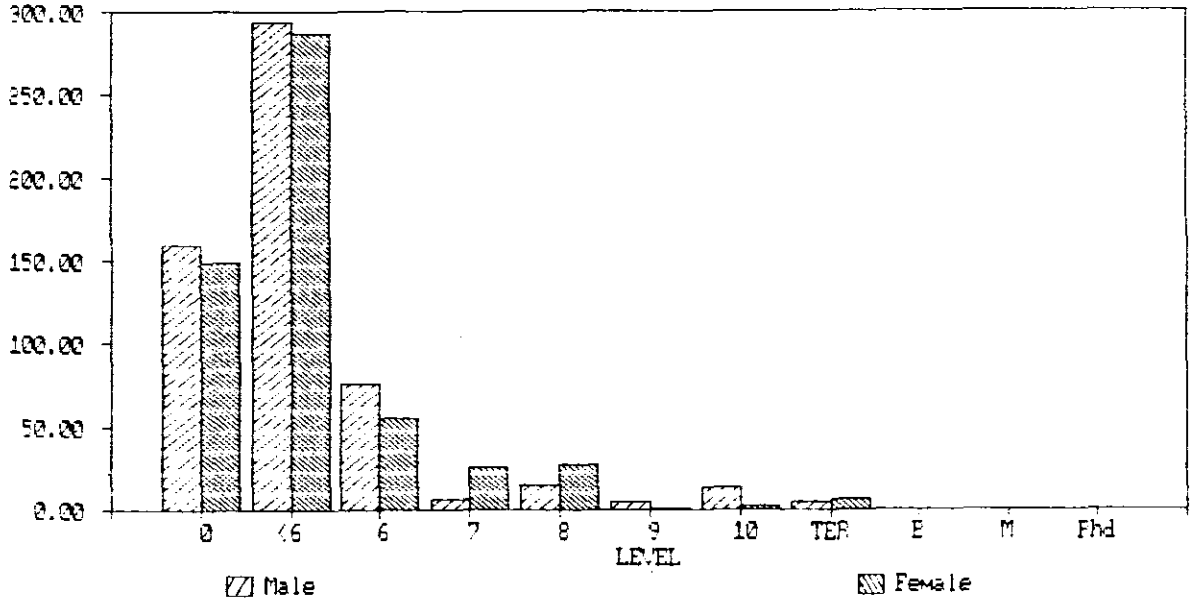
EDUCATION & OCCUPATION - WHITE

FIG 3.7

OCCUPATION - COLOURED



EDUCATION - COLOURED

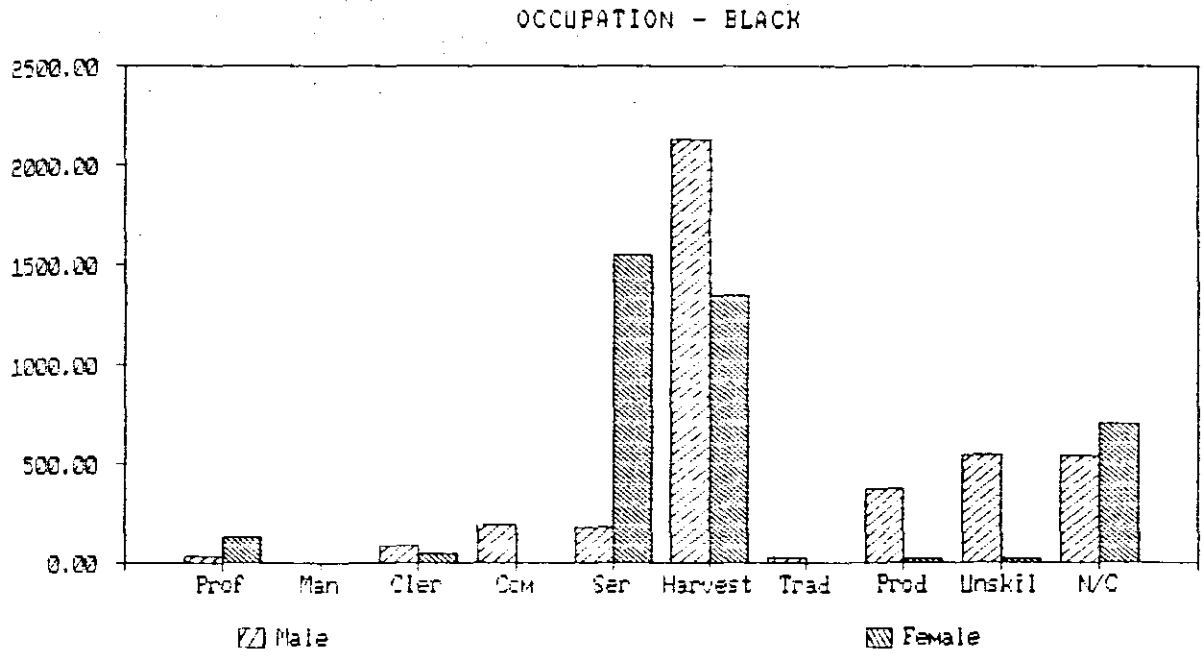


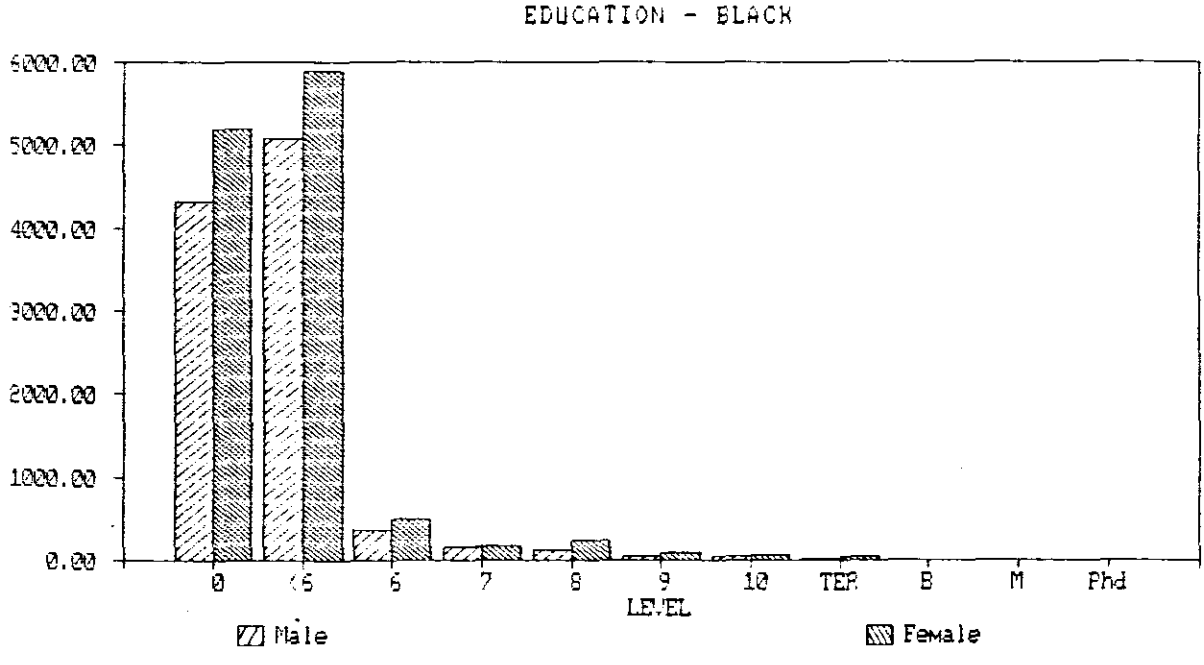
Source: POPULATION CENSUS 1985

PORT ALFRED

EDUCATION & OCCUPATION - COLOURED

FIG 3.8





Source : POPULATION CENSUS 1985

PORT ALFRED

EDUCATION & OCCUPATION - BLACK

FIG 3.9

Port Alfred have quoted vastly differing figures, in some cases differing by as much as 20 000 in the case of the Black population. All these reports have quoted the Population Census as reference.

Referring to Figure 3.10 it can be seen that the White population has grown steadily which would indicate that the supply of housing will continue. New developments such as the Royal Alfred Marina which caters mainly for this group will continue to contribute to population growth.

A steady growth in this group will assist economic development as small businesses are established to cater for the higher income sector of the population.

If growth were to continue as shown in the extrapolation in Figure 3.10 it could be expected that the White population will exceed 3000 by the year 2000.

It must be borne in mind that many of the properties sold in Port Alfred are purchased as second homes for vacation purposes and increases in this population would not normally be reflected in census data for the area. (unless the census was carried out during a holiday period)

The Coloured population has remained constant with slight fluctuations over the years. No rapid growth in this population group is foreseen and any developmental expenditure will be for the upgrading of existing facilities with small amounts for fluctuating growth.

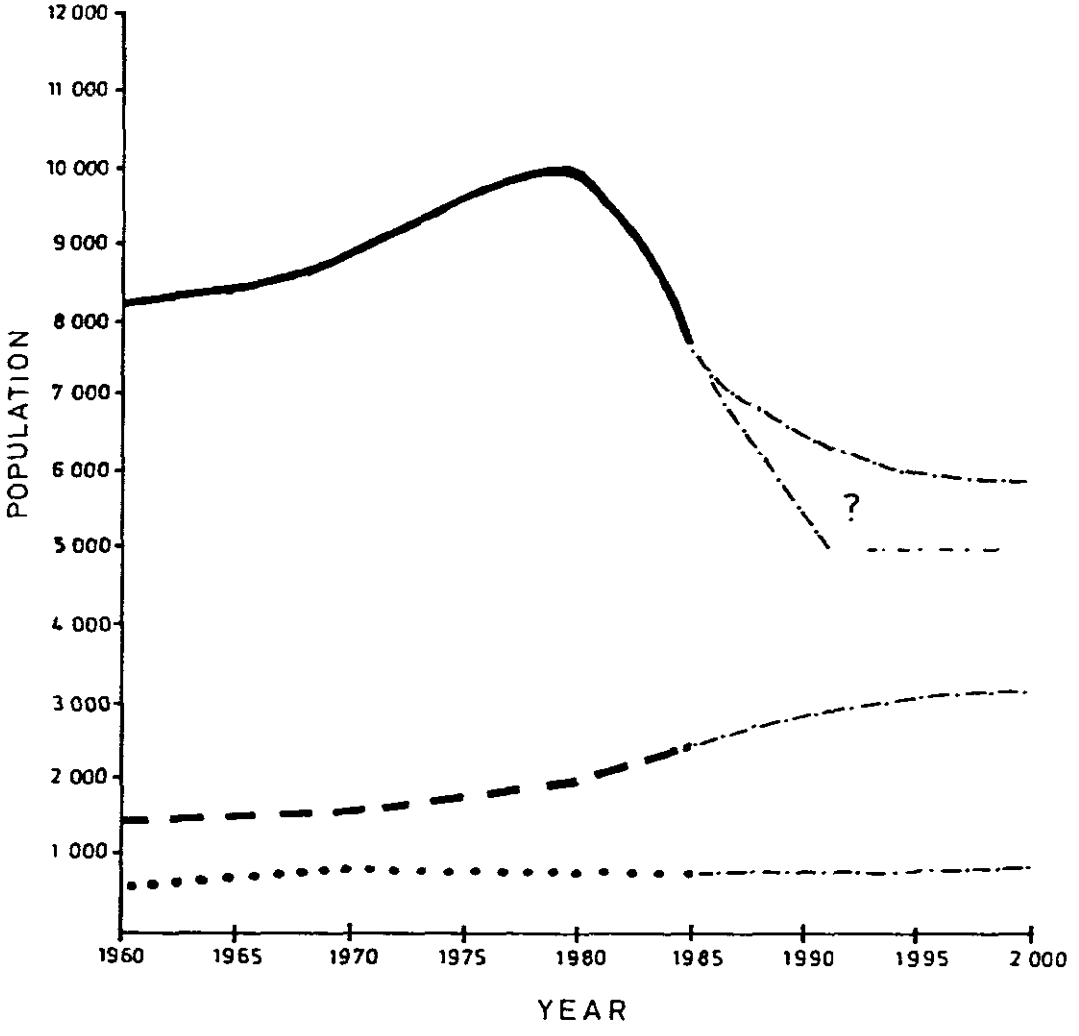
The Black population grew steadily until around 1980 where a downturn in growth is seen. (Figure 3.10) This appears to reflect the unemployment rate in the area and indicates an out-migration of workers in search of employment.

Port Alfred is situated near the Ciskei border and with the government policy of providing incentives for industries to locate in the "Independent States" (1980's) it is possible that employment opportunities for relatively unskilled labour exists there.

There are two scenarios shown in the extrapolation of the data in Figure 3.10. The first assumes that the decline in population will "bottom-out" once employment opportunities match the skills of the economically active sector of the population. This either implies that future industrial expansion will need to be labour-intensive or that the education level of the Black population in the area will need to be raised to meet the demand of future employers.

The second scenario indicated assumes that the above does not occur and that the major portion of the economically active population will need to seek work elsewhere. This could amount to some 30% of the total Black population. The dependency ratio of the remaining population would be extremely high and could lead to increased levels of poverty within this group.

From the trends discussed above it becomes apparent that a slow growth of Port Alfred can be expected with much of the



WHITE POPULATION GROUP

COLOURED POPULATION GROUP

BLACK POPULATION GROUP

PROJECTION

Source : CENTRAL STATISTICAL SERVICES

PORT ALFRED

DEMOGRAPHIC TRENDS

FIG 3.10

development being funded by and for the white population in terms of tourism (the major economic base of the town) and further retirement homes.

However, a structure plan for the area will not only have to consider the expansion of the White residential component but will also need to take cognisance of the expansion requirements of the Black Township and the allocation of land for industrial purposes to alleviate the unemployment problems.

4

L A N D U S E A N D P R E S E N T Z O N I N G S

4.1 GENERAL

Figure 4.1 is an aerial photograph taken in 1981 (before the commencement of the marina) showing the urban extent of Port Alfred.

Land use in Port Alfred is controlled by a statutory zoning scheme in terms of Section 7 of the Land Use Planning Ordinance No 15 of 1985. This scheme controls the development rights of each erf. (Figure 5.9)

The main urban areas are concentrated in the valley of the Kowie river and on the enclosing hills either side bordering on agricultural land further to the north east and south west (Figure 4.1 and Figure 4.2 which gives a general overview of land use in the area).

The main urban area is dissected north east / south west by the R 72 main road between Port Elizabeth and East London with main access to the town centre via Main Road and Causeway.

4.2 CIVIC AND STATE

Municipal land is distributed on either side of the Kowie, the central Municipal Offices and community hall being centrally located on the south west bank with equal

FEBRUARY 1987 Source : DEPT. OF SURVEYING - U.C.T.

PORT ALFRED

URBAN AREA

SCALE 1:20 000

FIG 4.1

accessibility from most parts of the town. (See aerial photograph, Figure 4.1 and Central Land Use, Figure 4.4)

The municipal workshops are located on the opposite side of the river with access from the central offices over either the Putt or Nico Malan bridges.

State land comprises of the area around the railway station which includes shunting yards and storage facilities. This is extended in a narrow strip of railway reserve also under the jurisdiction of South African Transport Services.

It must also be noted that with a few exceptions all land below the High Water Mark is State land (Seashore Act, No 21 of 1935 as amended) which includes the lower edges of the beaches, the river and the canals in the Royal Alfred Marina.

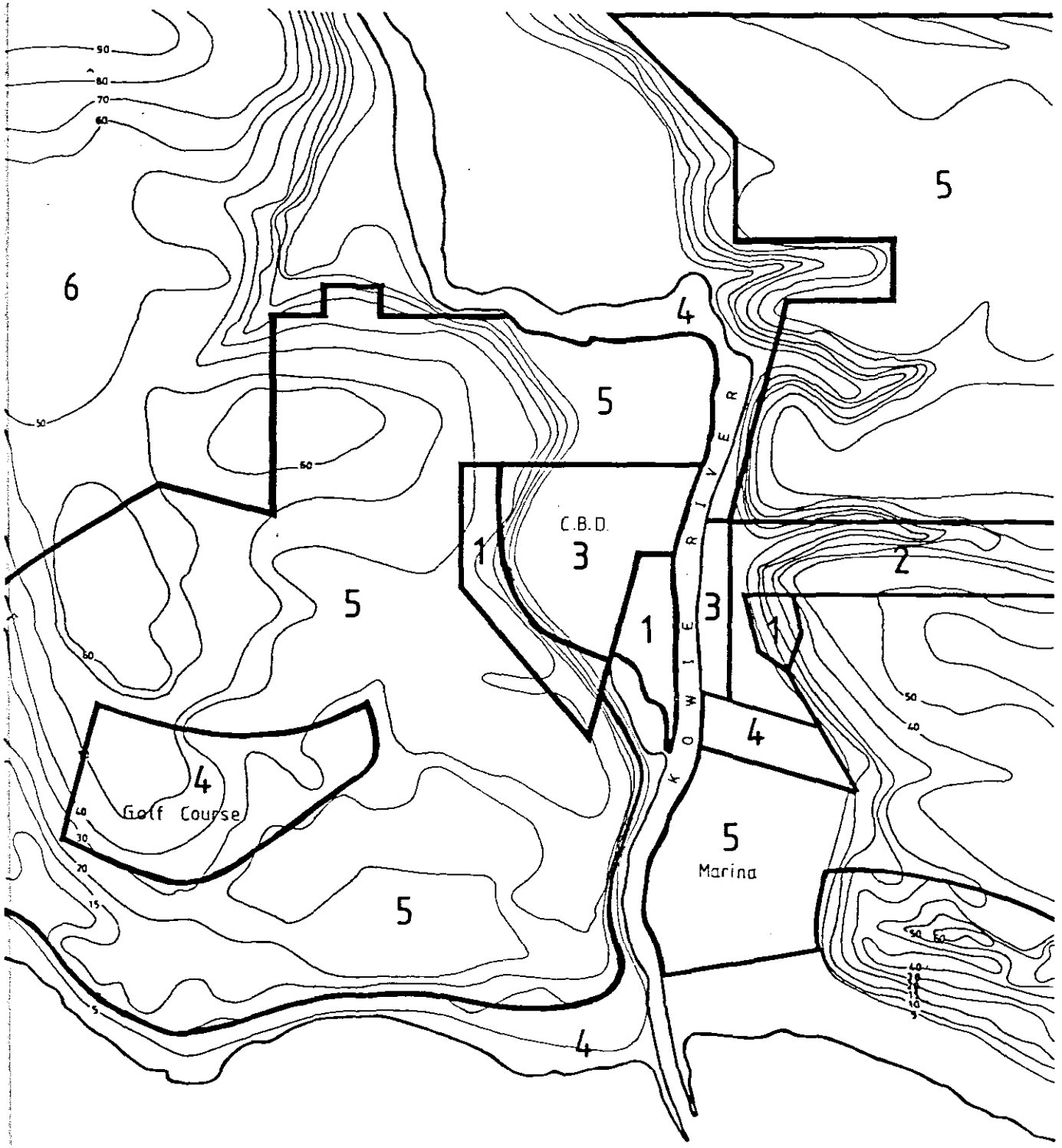
The airfield to the north of the town is leased State land but its present use can be seen as Commercial.

4.3 COMMERCIAL

Commercial activity is centrally located on either side of Main Road (Figure 4.3 and 4.4) and comprises of shops, professional offices and financial institutions.

Much emphasis is put on shops supplying angling and boating equipment as well as repairs.

The older commercial section of the town is located on the north eastern side of the river along Wharf Street which



1	CIVIC	4	RECREATION
2	STATE	5	RESIDENTIAL
3	COMMERCIAL	6	AGRICULTURE

PORT ALFRED

GENERAL LAND USE

SCALE 1:20 000

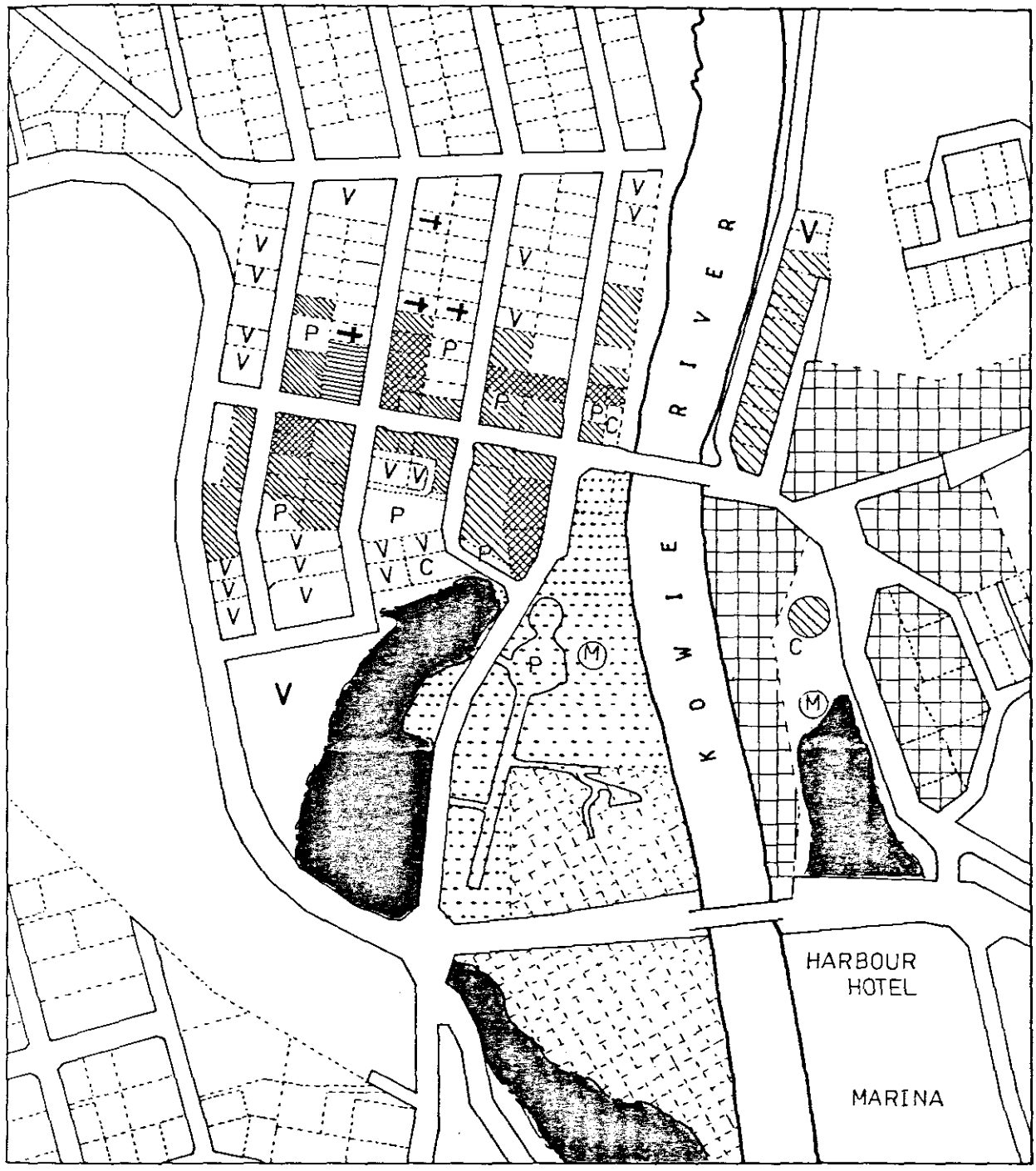
FIG 4.2

DECEMBER 1981 Source : DEPT. OF SURVEYING - U.C.T

SCALE 1:5 500

PORT ALFRED
CENTRAL BUSINESS DISTRICT

FIG 4.3



SINGLE RESIDENTIAL
VACANT
WORSHIP
PARKING
SERVICE INDUSTRY
MUNICIPAL
COMMERCIAL
S.A.T.S.
GOVERNMENT
CLINIC
PRIVATE OPEN SPACE
PUBLIC OPEN SPACE
LAGOON

PORT ALFRED
CENTRAL LAND USE

FIG 4.4

caters mainly for the Black township and the off-loading and sale of fish by local fishermen.

The site area per land use category is as follows:

LAND USE CATEGORY	TOTAL SITE (ha)
Retail	1,80
Motor Trade	1,04
Private offices	0,15
Services	1,61

COMMERCIAL LAND USE

TABLE 4.1

4.4 RECREATION

On account of Port Alfred's recreational opportunities the base of its economy has become tourist-orientated.

Although the town itself relies on income from this source, much of the recreational activity takes place in the natural environment provided by the area and very few artificial facilities such as "amusement parks" or waterfront / seafront developments have been provided.

It is within this land use sphere that potential exists for the exploitation of the seasonal tourist population thereby increasing economic activity and providing much needed employment.

It is foreseen that the careful exploitation of this source could further enhance the attractiveness of the town as an alternate to the already established (widely accepted) holiday venues on the coast.

The various existing recreational activities are discussed below:

4.4.1 ANGLING

Angling is well catered for in Port Alfred which boasts an abundance of fish of different species.

The Kowie River is navigable for some 24 kilometres but most of the angling activity is confined to the area which is flushed daily by tidal action. The town has several shops selling bait and boat hire is also available.

Figure 4.5 also indicates the angling potential in the way of fish species of the estuary as well as the favourite sea angling areas within easy access of Port Alfred.

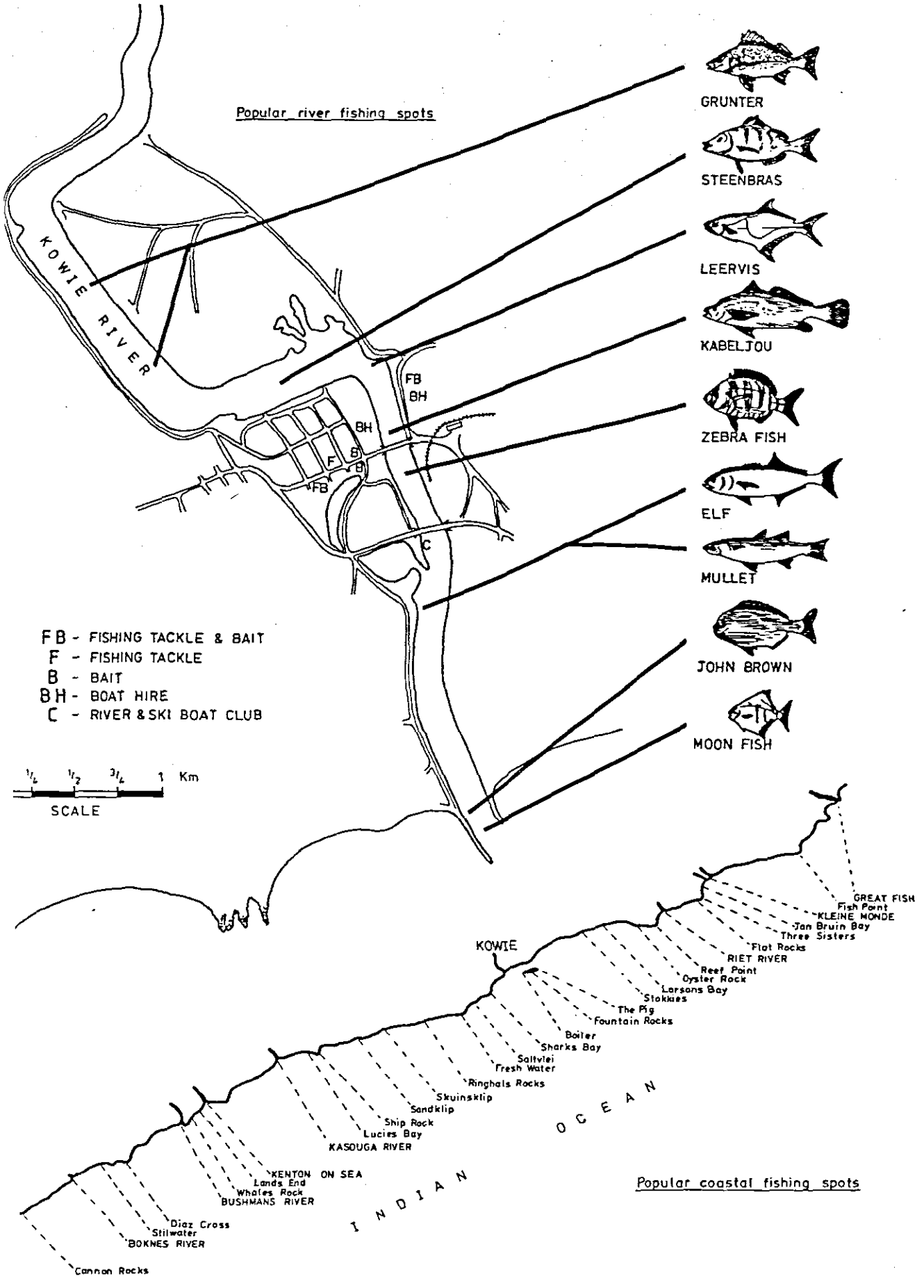
4.4.2 BOATING

Boating has become a popular recreational activity in Port Alfred mainly because of the fact that the river is navigable for some distance inland as well as the fact that channelisation of the mouth has made access to the sea possible.

There are 50 midstream moorings as well as some 55 jetties on the banks, mainly in the residential areas.

The Royal Alfred Marina also offers mooring facilities for 267 boats.

It is apparent therefore that should the breakwaters be



SOURCE : PORT ALFRED TOURIST BUREAU

PORT ALFRED

RECREATION - FISHING

FIG 4.5

extended to create a far safer access to the sea that this boating activity will increase even further.

The Port Alfred Municipality has a total of 490 recreational boats and 160 semi-commercial and commercial boats registered which will undoubtedly increase as the marina comes into full operation. The question arises here of just how many boats can be borne by the river without causing significant impact, a matter addressed later in Section 5.2.2.1.

4.4.3 LAND-BASED RECREATION

As can be seen in Figure 4.6 Port Alfred offers a variety of land-based recreation and sports facilities including tennis, squash, rugby, cricket, bowling and one of South Africa's oldest golf courses which was established in 1907.

4.4.4 WATER SPORTS

The Kowie estuary and adjacent coastline provide the perfect location for various types of water sports (Figure 4.6) and these can be seen as an important attraction to the area.

4.5 RESIDENTIAL

The main residential area is spatially divided into six sub-areas as can be seen in Figure 4.7 .

The four White residential sub-areas are located as follows:

1 A low-lying area in the bend of the river to the north of the Central Business District on the banks of the area known as Bay of Biscay. The houses which are adjacent to the river are of a luxurious nature and are owned by the high income group of the population.

2 An area on the crown of the West bank hills near the golf course. These residences belong to the medium to high income groups, with those which are located on the southern and eastern periphery having sea and river views, respectively.

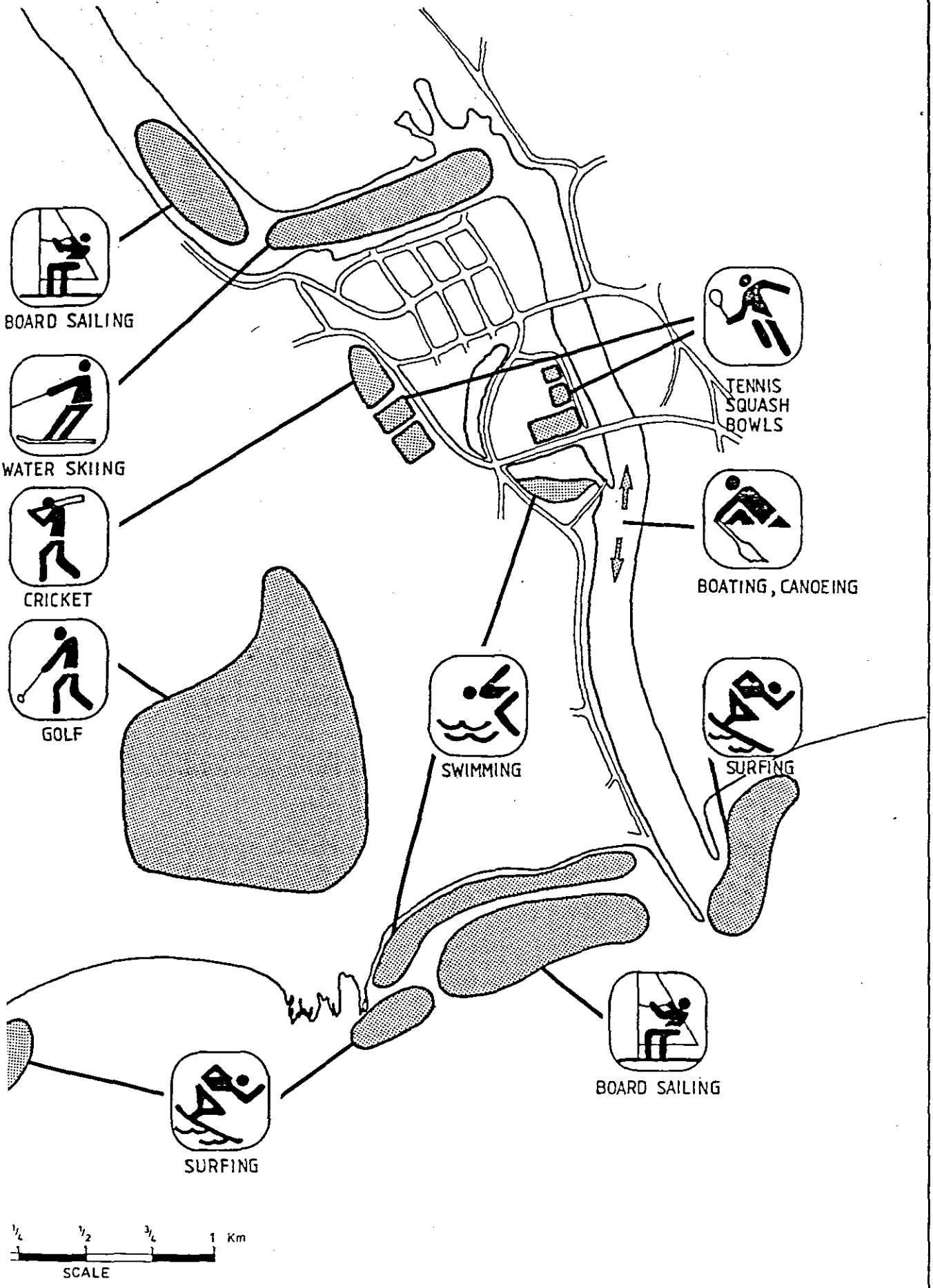
3 An area which extends up onto and over the crown of East bank hills. Few of these residences have spectacular views and are owned mainly by the medium income groups.

4 The Port Alfred Marina which comprises of 360 residential erven of between 520 and 1030 square metres in extent. All of these properties have a minimum waterfront length of 15 metres and can be seen as belonging to an elite high income group many of whom are foreign investors.

The other two population groups resident in Port Alfred are as follows:

5 The Black township is located on the hills to the north of the central part of Port Alfred (Figure 4.2) and houses the largest proportion of the population. This area is home to the low income groups.

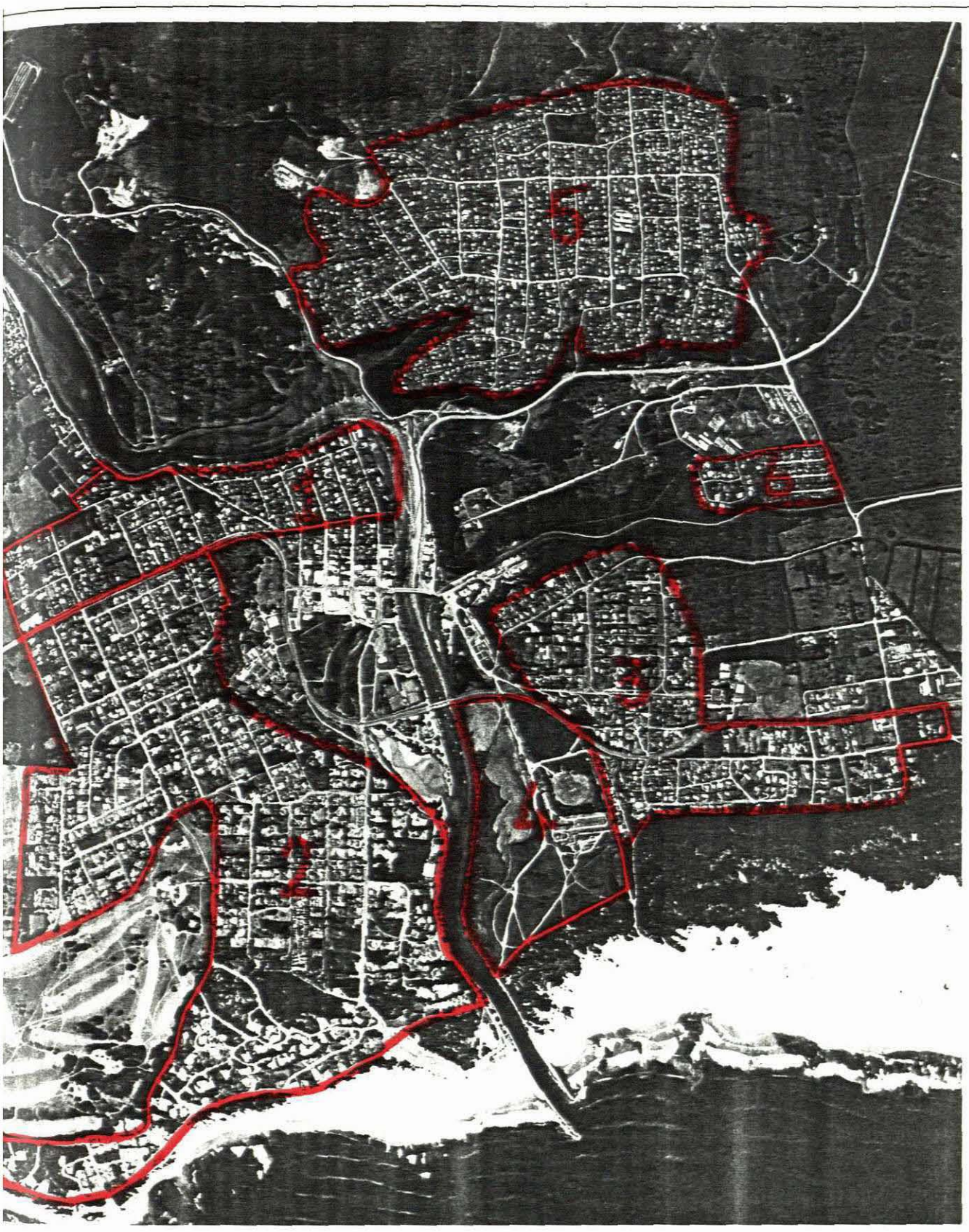
6 The Coloured township which lies on the slope of Station Hill below and to the south of the Black township. This



PORT ALFRED

RECREATION - SPORT

FIG 4.6



1 White
2 White
3 White
4 White (Marina)
5 Black
6 Coloured

FEBRUARY 1987 Source DEPT. OF SURVEYING - U.C.T

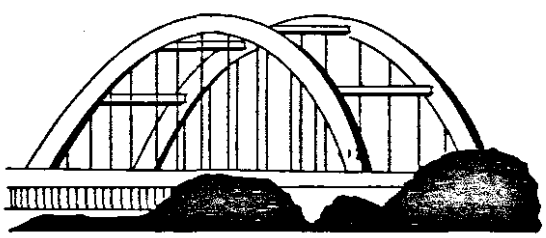
1:20 000

PORT ALFRED
RESIDENTIAL SUB-AREAS

FIG 4.7

area houses approximately 10% of the total Port Alfred population and can also be seen as a generally low income area.

SECTION 2



STRUCTURE PLAN

5

DEVELOPMENT CONSTRAINTS

5.1 ANALYSIS METHODOLOGY

In order to formulate a strategy for the future development of an area and to ensure that this proposed development is in harmony with the environment it is necessary to adopt an analysis system which properly addresses this matter. In this case the end product is a structure plan and management strategy document.

There are several acceptable techniques for determining the impact of a development on an area, namely checklists, matrices which allocate weightings in the form of numerical values to certain activities which have varying levels of impact such as the Leopold Matrix, graphic overlays as proposed by Ian McHarg, panel evaluations carried out by discipline experts, and 3-dimensional simulation computer techniques.

As this study is not related to any particular development proposal, where all of the above techniques are valid, but rather a future guide to development and the identification of potential environmental hazards, the method of evaluation has been adapted to include both the matrix system in which a certain level of subjective evaluation is necessary in the allocation of numerical values and the overlay or "sieve" systems which graphically analyses

physical attributes.

Much of the emphasis is placed on the physical environment because it is the future spatial expansion of the town which will be the major cause of both physical and socio-economic environmental change. The object should be to ensure that this change is beneficial.

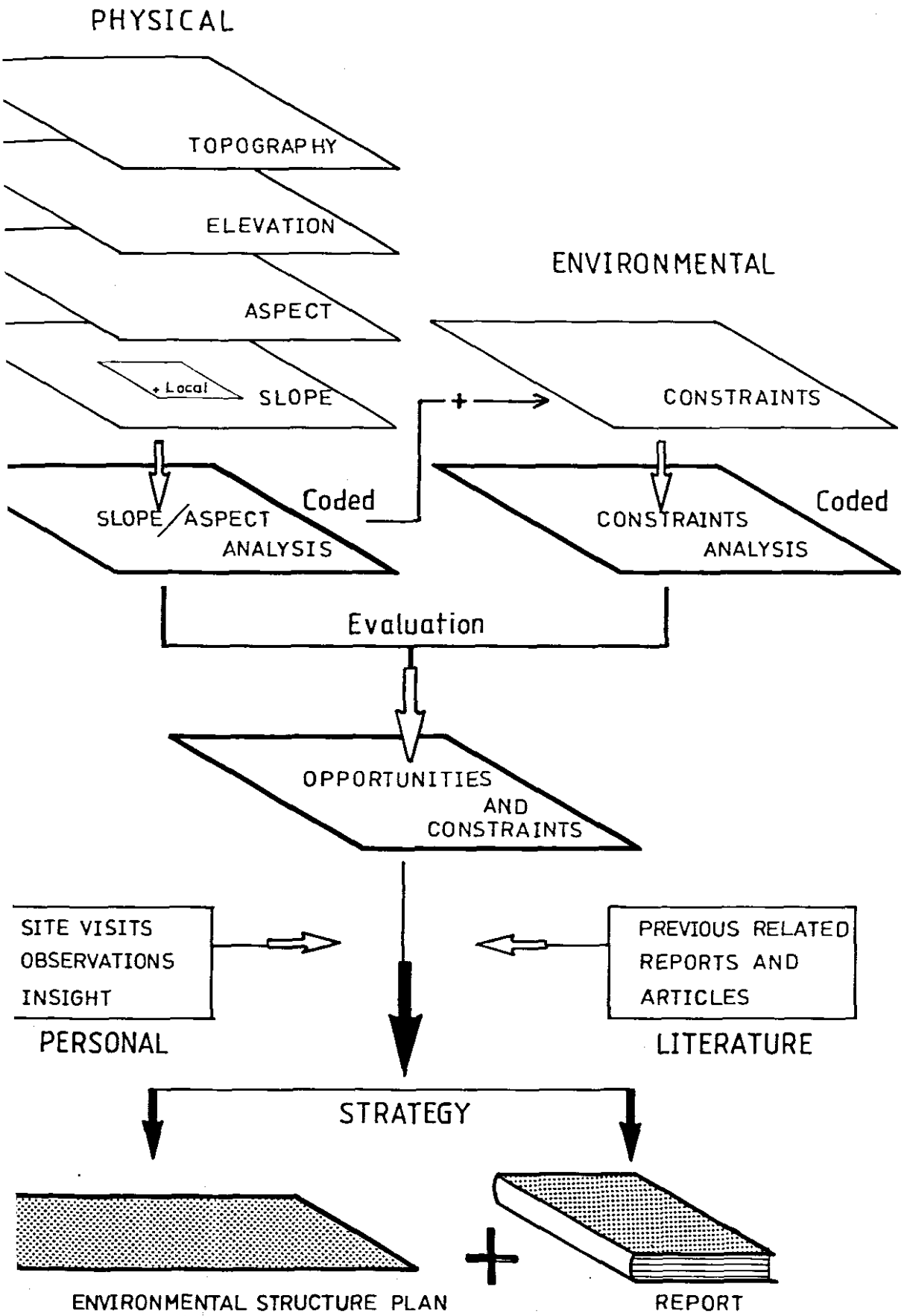
The system adopted is one in which the physical attributes along with other environmental constraints are coded in a tabular form and then overlayed onto maps of the area showing degrees of "development desirability" or physical possibility.

The method provides a graphic representation of where development is not desireable or where the envisaged environmental change would have a negative impact on the existing systems and on the other hand where designed environmental change could have a positive impact.

A certain level of subjectivity inevitably exists in the same way as with the matrix method in that the evaluator is required to allocate numerical values to physical attributes.

By combining both the numerical allocation and the "sieve" or overlay technique a visual presentation is produced in which weightings can be adapted should conditions change.

In this case the numerical allocations are simple, ranging from "0" for areas considered most desireable or where no



PORT ALFRED

ANALYSIS METHODOLOGY

FIG 5.1

impact would occur, to "10" for areas which should be totally conserved, and producing a composite map which can be used as input to evaluations which may be performed on various aspects. The physical attributes such as elevation, slope and aspect can be seen as static in that only small changes over a very long time period (erosion etc.) can be expected.

Figure 5.1 indicates graphically the analysis process which has been adopted:

- maps of the various physical attributes of the region are prepared and presented in an analysed form which consider each of the constraining factors by heading (one map, one subject)

- each map is then overlayed and coded with a numerical system ranging from "0", for areas which have been analysed to have the best attributes for development, to "10" for those considered as physically impossible or undesireable, for physical or other environmental reasons, for development

- the coded overlays are then composited to form a final map of the physical attributes showing the totals of the allocated numbers, in this case ranging from "0" to "6"

- environmental constraints such as water catchment and drainage areas, floodplains and environmentally sensitive areas are at this stage considered seperately and analysed with the allocation of numerical values ranging

from "0" to "10"

- the physical and environmental constraints are then overlayed to form a Constraints Analysis map with numerical values from "0" to "16" for the least favourable areas, which is the highest value which can be obtained in the summation of the previous overlays

- this map is used as input to a graphical representation showing the opportunities and constraints which exist in the area

The weighting system used in the following Figures is the subjective opinion of the author and have been allocated in the following way:

- the slope and aspect of the land has been divided into categories considered to indicate the level of consideration which should be given to them in comparison to other constraints

- in the same way as above, environmental constraints such as sensitive catchment and dune areas have been categorised in comparison to others

- it can be seen that south facing slopes are considered to be less of a constraint (value = "2") than catchment areas (value = "10").

The weighting values allocated by different disciplines, in a multi-disciplinary approach, and interest groups would most likely differ, but the overall result in spatial

distribution of constraints would conform closely to Figure 5.10.

The Opportunities and Constraints map (Figure 5.10) in combination with observations made during site visits and the information from Section 1 of this report are then utilised to compile an Urban Structure Plan (Figure 7.12) which acts as a guide to future development.

The advantages of this system are as follows:

- it can be easily adapted to suit any area with various attributes

- the allocation of numerical values can be carried out by a panel of experts from different disciplines including members of the public and combined by consensus thereby obtaining input from a wide spectrum

- there can be as many overlays as there are criteria and criteria can be added to the final numerical product at any stage

- maps are more easily comprehensible even to the uninitiated and can present large quantities of data on a single sheet

- graphic presentation can be more easily evaluated than large numerical tables or volumes of explanatory text

Each of the criteria examined for the purpose of this report are discussed in detail below.

5.2 PHYSICAL CONSTRAINTS

The physical constraints of the area are seen to fall into two major categories, namely regional and local.

The regional constraints of the area are determined by means of the "sieve" map method.

5.2.1 REGIONAL

5.2.1.1 SLOPE

Using a standard contour plan of the region, with contour intervals of 20m, (Figure 5.2) a slope analysis has been carried out to determine those areas which could be considered to be problematic to development in general.

As can be seen in Figure 5.4 and local map (Figure 5.5), the area immediately adjacent to the river estuary has slopes in excess of 1:5 which although not precluding development could be undesirable from a living environment aspect if combined with a southern aspect (Figure 5.7).

The steep slopes encountered along the coast to the north east of the river mouth, although south-facing, offer panoramic views of the sea and could be gainfully used for residential development as long as the sensitve dune area is adequately protected.

When considering the possible introduction of more industrialised activity into the region the area to the north east of the town appears to offer the highest

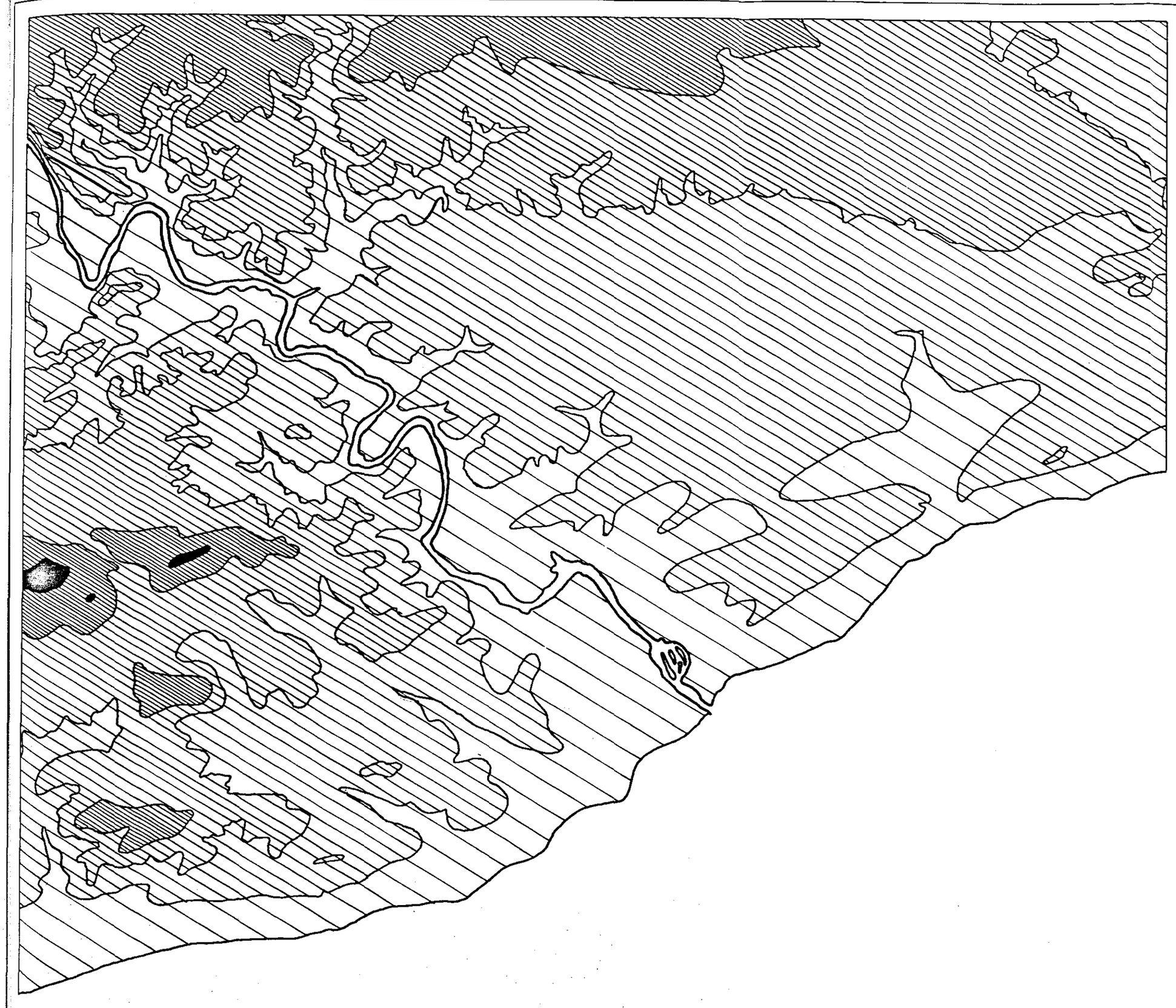
Base Source : TOPO MAP SA 3326 DB

PORT ALFRED

TOPOGRAPHY

SCALE 1:50 000

FIG 5.2



LEGEND

SEA LEVEL

0 - 50

50 - 100

100 - 150

150 - 200

> 200

ELEVATION IN METRES

PORT ALFRED

ELEVATION

SCALE 1:50 000

FIG 5.3

LEGEND

SLOPE < 1:30

1:20 TO 1:30

1:10 TO 1:20

1:5 TO 1:10

SLOPE > 1:5

REFLECTS GENERAL CHARACTER

PORT ALFRED

SLOPE

N

SCALE 1:50 000

FIG 5.4

KOWIE RIVER

LEGEND

> 1:5

1:5 to 1:10

1:10 to 1:20

1:20 to 1:30

1:30 to 1:50

< 1:50

CONTOURS USED AT 5 metre INTERVALS

Base Source : ORTHOPHOTO 3326 DB 8 & 9

PORT ALFRED

SLOPE (Local)

SCALE 1:10 000

FIG 5.5

LEGEND

SLOPE < 1:30

NORTH

SOUTH

EAST

WEST

REFLECTS GENERAL CHARACTER

PORT ALFRED

ASPECT

SCALE 1:50 000

FIG 5.6

LEGEND

SLOPE

< 1:30	=	0
1:20 to 1:30	=	1
1:10 to 1:20	=	2
1:5 to 1:10	=	3
> 1:5	=	4

ASPECT

North	=	0
South	=	2
East	=	1
West	=	1

COMBINED ANALYSIS OF SLOPE AND ASPECT PRODUCE SUMMATION DISTRIBUTIONS

MOST FAVOURABLE = 0

↓

LEAST FAVOURABLE 6

PORT ALFRED

SLOPE/ASPECT ANALYSIS

N

SCALE 1:50 000

FIG 5.7

potential with general slopes of 1:30 or less.

5.2.1.2 ASPECT

Because of the region's general location on the southern slope of the coastal plateau adjacent to the ocean and the associated increase in height inland (Figure 5.3) few north facing slopes exist save for those on the landward side of the undulating primary and secondary dune structure.(Figure 5.6)

The aspect or orientation of the coastal strip is mainly south to south-east which as previously mentioned affords good sea vistas. This is, however, a general trend along the whole of the Cape south coast and is not unique to Port Alfred.

This southern slope is also situated along the sensitive primary dune area and becomes problematic when considering management of this environment and its desirability for seafront development.

5.2.1.3 RESIDENTIAL INFRASTRUCTURE

Figure 5.8 indicates the position and extent of the existing residential infrastructure. Although this cannot be seen as a constraint in itself any overall planning for the expansion of Port Alfred will have to take cognisance of that which already exists resulting in restraints to spacial planning.

The accompanying Figure 5.8 indicates clearly the pockets

LEGEND

FLOOD PLAIN

URBAN AREA

DUNE AREA

NOISE/SAFETY

ROADS

RAIL

DRAINAGE CHANNEL

PORT ALFRED
CONSTRAINTS

SCALE 1:50 000

FIG 5.8

of residential development, catchment areas which drain into the Kowie and Rufane rivers and areas set aside for recreational activities.

It is also apparent that the area surrounding Port Alfred airfield will be unsuitable for residential development although the expansion of industry into this area could be seen as compatible. Major seasonal aircraft approaches to this airfield are indicated (areas with high noise levels) and are assumed from wind data for the area. (See Figure 2.7)

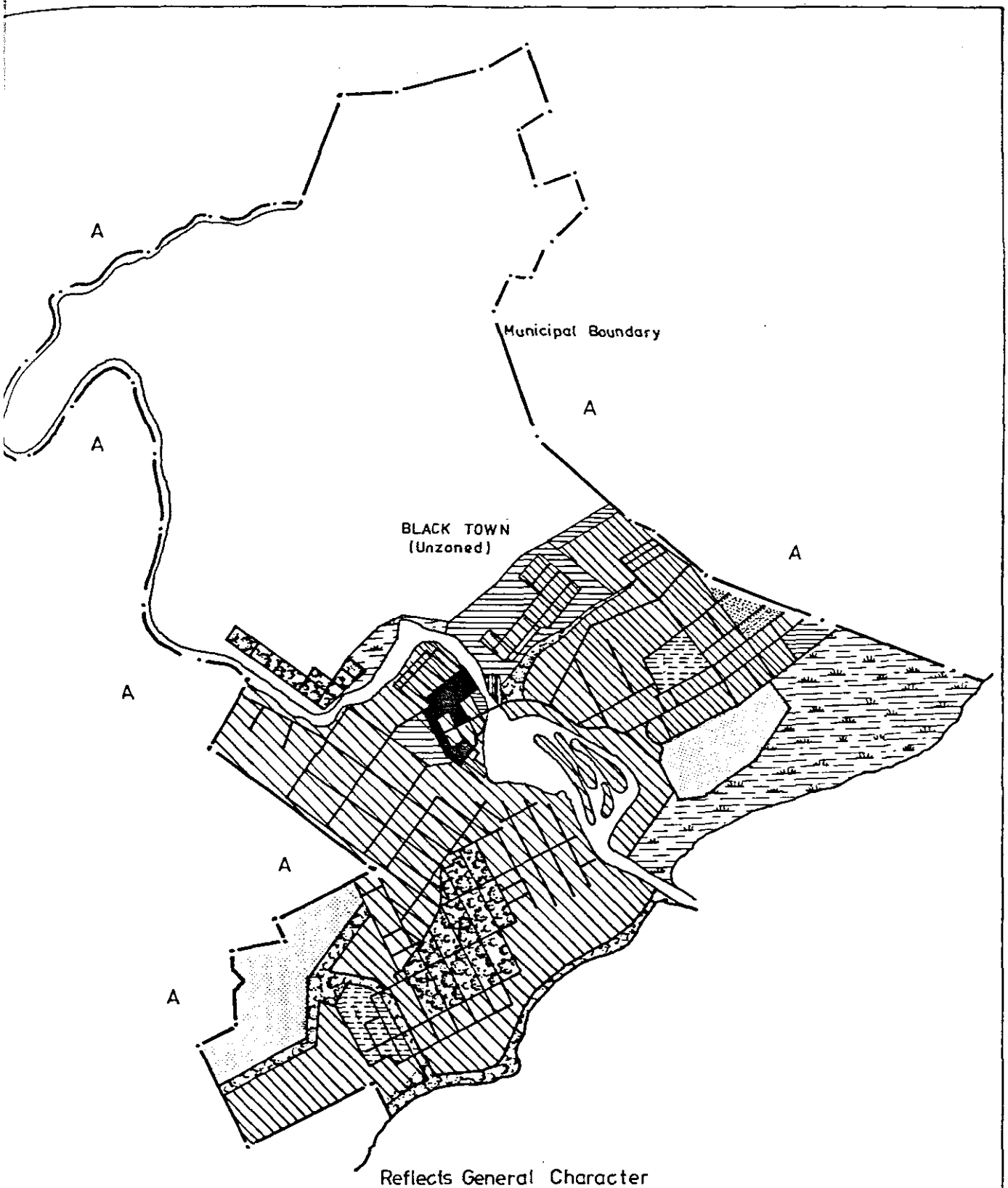
5.2.1.4 ZONING

The existing land uses conform to the Zoning Scheme, No 325/2, and it appears from inspection of the zoning plans that new development patterns will not be unduly restricted by the Scheme.

Two areas with unspecified zoning ("undetermined") exist on the north west periphery of the residential area and to the south of the existing residential area on the east bank. (Figure 5.9)

West Beach is zoned as "Public Open Space" whilst East beach and the marina area is zoned "Amenity" which does not preclude development in this area.

The sections of land adjacent to the river, not under the ownership of the municipality or South African Transport Services, are zoned "Amenity" and could therefore be



Reflects General Character

RESIDENTIAL	BUSINESS
INDUSTRIAL	EDUCATION
LOCAL AUTHORITY	AMENITY
PUBLIC OPEN SPACE	PRIVATE OPEN SPACE
A AGRICULTURE	UNDETERMINED

Source : PORT ALFRED ZONING SCHEME No 325/2 JAN. 1988. C.P.A.

PORT ALFRED
ZONING

FIG 5.9

upgraded for community use.

5.2.1.5 ENVIRONMENTALLY SENSITIVE AREAS

The sensitive areas of main concern are the river and its associated catchment area and the primary dunes along the coastline.

As can be seen from Figure 5.8 the upper reaches of the Kowie River are fed by several streams and water courses.

The present agricultural status of this area should remain if these small tributaries are to continue providing water of an acceptable quality. As mentioned in the Section 2.4 - Pollution Effects, a danger of contaminated run-off could exist if the banks and associated catchments of the upper river were considered for residential or industrial development.

The lower reaches of the river are overlooked from both banks due to the land form. Maximum use is made at present of the hills for creating views from houses and hotels which are placed facing the river.(Figure 5.12) The river floodplain can therefore be considered as a large natural open space in which certain elements of built fabric preside. Cognisance has been taken of this aesthetic sensitivity in guidelines layed down by the developer in conjunction with the municipality for the development of houses in the marina which now dominates this vista.

LEGEND

EXISTING DEVELOPMENT

ENVIRONMENTAL CONSTRAINTS

RECREATION = 2

NOISE DANGER = 3

FLOOD PLAIN = 6

DUNE AREAS = 8

CATCHMENTS = 10

PHYSICAL CONSTRAINTS

SLOPE 0 to 4 (S)

ASPECT 0 to 2 (A)

FAVOURABILITY OF SLOPE

A+S = 0 to 6

MOST FAVOURABLE 0

⇩

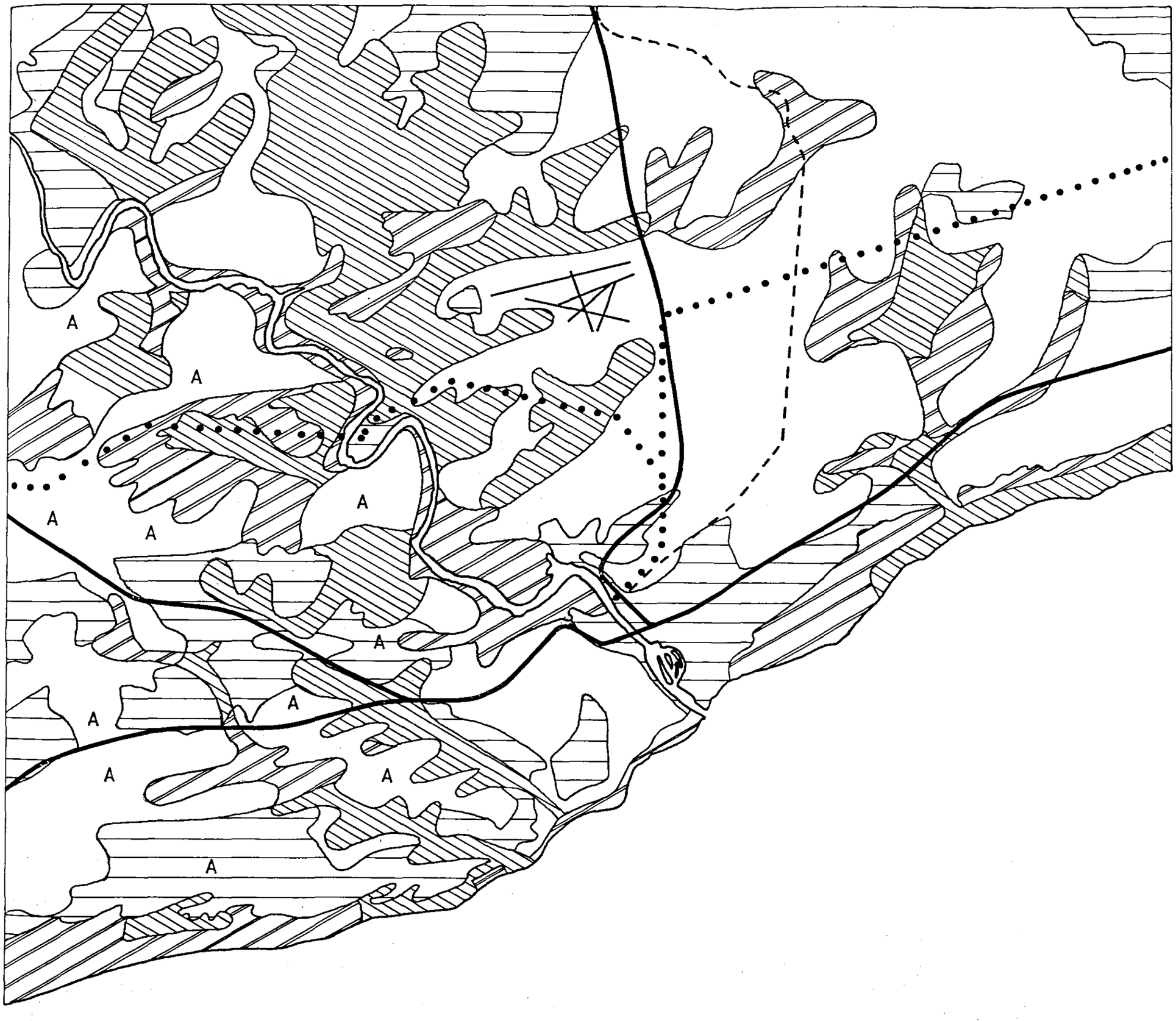
LEAST FAVOURABLE 16

PORT ALFRED

CONSTRAINTS ANALYSIS

SCALE 1:50 000

FIG 5.10



LEGEND

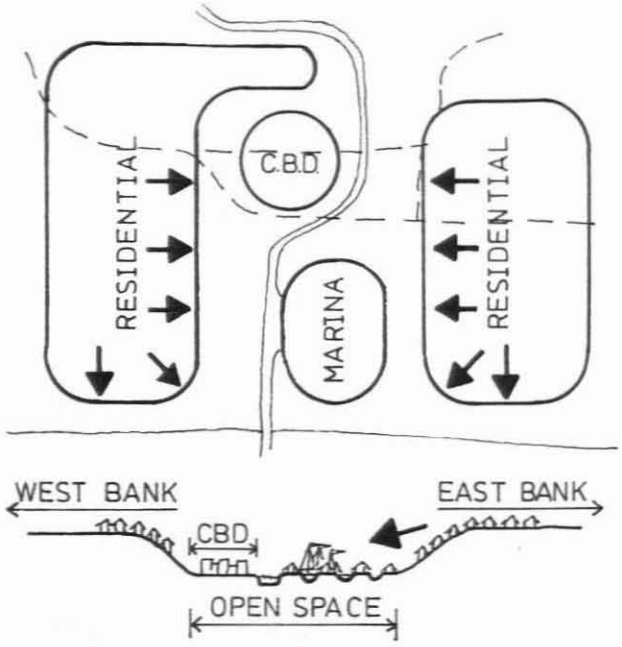
- GOOD DEVELOPMENT POTENTIAL
- MINIMUM CONSTRAINT
- CONTROLLED DEVELOPMENT
- RESTRICTED DEVELOPMENT
- A AGRICULTURAL CONSIDERATIONS
- MAJOR ROAD
- RAIL ROUTE
- POWER LINE

PORT ALFRED

OPPORTUNITIES & CONSTRAINTS

SCALE 1:50 000

FIG 5.11



VIEWS TO RIVER

FIGURE 5.12

The dune areas which form part of a continuous chain along the Cape south coast have already been infringed upon in the area immediately to the west of the river mouth. The

area to the north of the mouth still remains intact and although there are future plans for urban development in this area (See Section 7.7.8) it is of vital importance to the ecology of these dunes that should this development take place it is managed in an ecologically acceptable manner.

EAST BEACH DUNES

FIGURE 5.13

5.2.1.5 SUMMARY

The above contraints are summarised in Figure 5.11 which shows the composite result of the "sieve" map investigation carried out using Figures 5.2 to 5.10. This map forms the basis on which areas of land suitable or unsuitable for development within the region can be visually determined.

5.2.2 LOCAL

A slope analysis of the area more localised around the river is shown in detail in Figure 5.5 using contours from the Orthophoto series numbers 3326 DB 8 and 9 which are at 5 metre intervals.

The local area has been divided into 4 sections to facilitate easy spatial location during evaluation.

5.2.2.1 RIVER AREA

The present urban development of Port Alfred extends along approximately 10 kilometres of river frontage and places a high load on the river in terms of human usage.

Carrying capacity studies for an estuary such as this are problematic, of questionable accuracy and the resultant findings cannot be substantiated. However, should development along the banks increase further, such a study might be advisable to give an indication of capacities and to ensure that the quality of water remains acceptable (See Section 2.4 - Pollution Effects).

From the slope analysis of the river gorge (Figure 5.5) it can be seen that a constraint exists in terms of excessive slope on the areas immediately above the flood plain (Figure 2.1 - Section 1).

It is this excessive slope which has led to urban development taking place within the 50 year flood plain.

5.2.2.2 WEST BEACH

The area immediately to the inland side of the coast has already been extensively developed with a coastal road running in front of the residences.

As can be seen in Figure 2.3 - Section 1 this coastal road impinges on the primary dune area, especially near the cabana holiday flats where the mobile dunes continuously deposit sand onto the road surface and nearby gardens.

The proposal to extend the West Pier of the breakwater could help to alleviate this problem and provide a more stable area in the vicinity of the parking area and beach restaurant. (See Section 7.7.8)

The stable and mobile dunes do, however, form a barrier between the urban development and the beach thereby effectively prohibiting development directly on the beach front. This reduces beach useage in this area but puts increased pressure on Kelly's Beach which has good access and is extensively used by bathers.

From personal observation it has been noted that because of the inaccessibility of the other parts of the beach much pedestrian traffic occurs across the primary dunes. Should this traffic increase substantially permanent damage of the binding vegetation could occur causing further destabilisation.

The present program of dune stabilisation will most

certainly assist in re-establishing vegetation but once the brush wood (used to bind the dune sand) has been replaced by natural vegetation a method of channeling pedestrian movement will need to be sought.

DUNE STABILISATION PROGRAM

FIGURE 5.14

At present the use of motor vehicles on the West beach is prohibited and thus a certain measure of conservation is being exercised.

5.2.2.3 EAST BEACH

Up until now the East Beach has not been utilised very heavily mainly because of its remoteness to the urban area and lack of easy access.

With the construction of the Royal Alfred Marina the original berm wall constructed in the 19th century has been removed and the landward side of the dunes adjacent to the marina used for the construction of houses.

This development has increased accessibility and will create pedestrian paths across the dunes from the houses. This traffic could have a negative impact on the dune vegetation.

This beach has for some time been open to use by motor vehicles licenced by the municipality for fishing purposes.

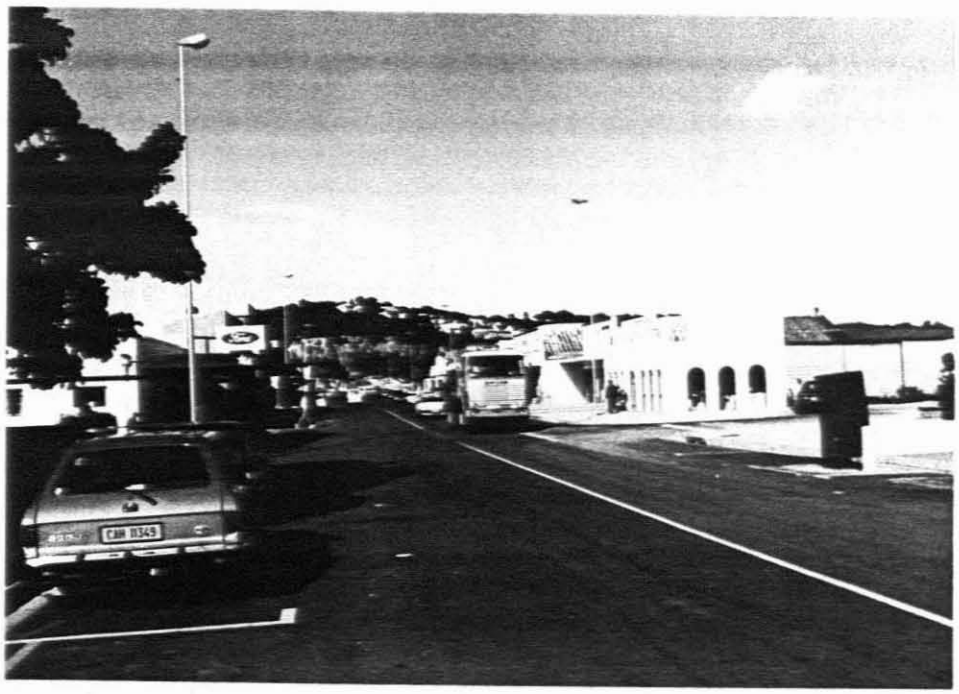
Although the new residents of the marina will put pressure on the municipality for further concessions, the present quota should not be increased.

The major constraint on this area is the sensivity of the stablised sand dunes and careful management is again required.

5.2.2.4. CENTRAL BUSINESS AREA

The central business district, located on the flood plain created by the first major bend in the river is restricted in terms of spatial expansion by the river to the north and east and by the escarpment on the south-western border.

Density of commercial development in the area is, however, low with only Main Street being utilised fully along its length.



MAIN ROAD

FIGURE 5.15

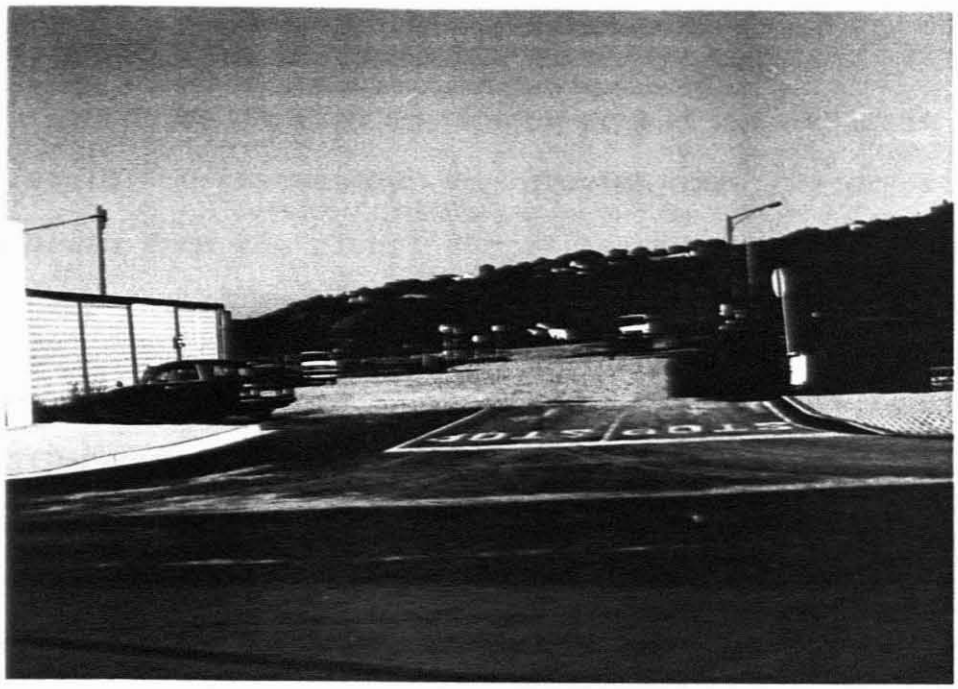
Relatively large areas of useable land exist to the south of Main Road and extensive development of the CBD could take place to cater for future demand.

A major concern here is that should weather or climatic conditions change as has been predicted for the Southern African continent (The Cape Argus - August 1989) serious flooding could occur. The CBD and newly constructed Royal Alfred Marina both lie less than 5 metres above mean sea level.

5.3 WATER SUPPLY

It appears that water supply could be a major constraint on

the future large scale development of Port Alfred, both physically and environmentally.



CBD DEVELOPMENT POTENTIAL

FIGURE 5.16

The town presently endures water shortages during dry spells and future expansion of the population, especially during the season, will only worsten the situation.

The cost of physically damming the Kowie River is extremely high and would have a significantly negative environmental impact when considering the reduced outward flow of the river.

Pollution which may have accumulated in the lower reaches, the area nearest to major development, would not easily be flushed but would drift up and down the river with

successive tidal action. Net outflow of this pollution would be severely reduced with a reduction of river flow.

In 1969 and 1970 there were 3 months of low flow followed by 10 months of no flow in the river and with this in mind it would be necessary to provide raw water storage (withdrawn from the river) for at least 1 year to tide the town over during droughts.

If one considers the population projections made in Section 3.5 (Demography) this volume would need to be increased substantially to cope with future demands. The Table below was prepared by Ninham Shand Inc. - Consulting Engineers, using an assumed 4% and 6% compound growth rate in the demand for water by the White and Black populations respectively.

Estimates on future demand for water are dependent on so many variables that they are of necessity far from exact and therefore would require constant updating as the future unfolds.

The introduction of industries into the Port Alfred area could significantly increase the demand for water.

The major concern here is that the town could enter a circular type of decision and consequence situation where the increasing population puts spatial pressure on the environment and at the same time through water demand detrimentally affect the river flow and therefore its

environmental quality.

YEAR	PORT ALFRED and other TOWNSHIPS Ml/day	EASTERN CAPE ADMIN BOARD & OTHER TOWNSHIPS Ml/day	AV. ANNUAL DEMAND		SUMMER PEAK DEMAND 2,15 x Av Ml/day
			Ml/Day	ml/Annum	
1985	1,33	0,21	1,54	562	3,31
1990	1,80	0,89	2,69	982	5,78
1995	2,44	1,00	3,44	1256	7,40
2000	3,27	1,13	4,40	1606	9,46
2005	3,98	1,51	5,49	2004	11,80
2010	4,84	2,02	6,86	2504	14,75
2015	5,89	2,71	8,60	3139	18,49
2020	7,16	3,62	10,78	3995	23,18

Source: Ninham Shand Inc. - Report No.749/3777

ESTIMATED FUTURE WATER DEMAND

TABLE 5.1

5.4 ACCESSIBILITY

In terms of constraints to development the major road linking Port Elizabeth and East London which passes through Port Alfred creates an east-west barrier between the CBD of the town and the beach recreational areas. This can be seen as prohibiting the formation of a more integrated urban form within Port Alfred. At present all traffic between these two sections of the town must cross the arterial at grade level.

The fact that the river also dissects the town, in a north south direction further aggrevates the situation in that traffic to the marina must enter the arterial to move from the west to east banks on the sea side of the road.
(See Figure 4.1 - Section 1)

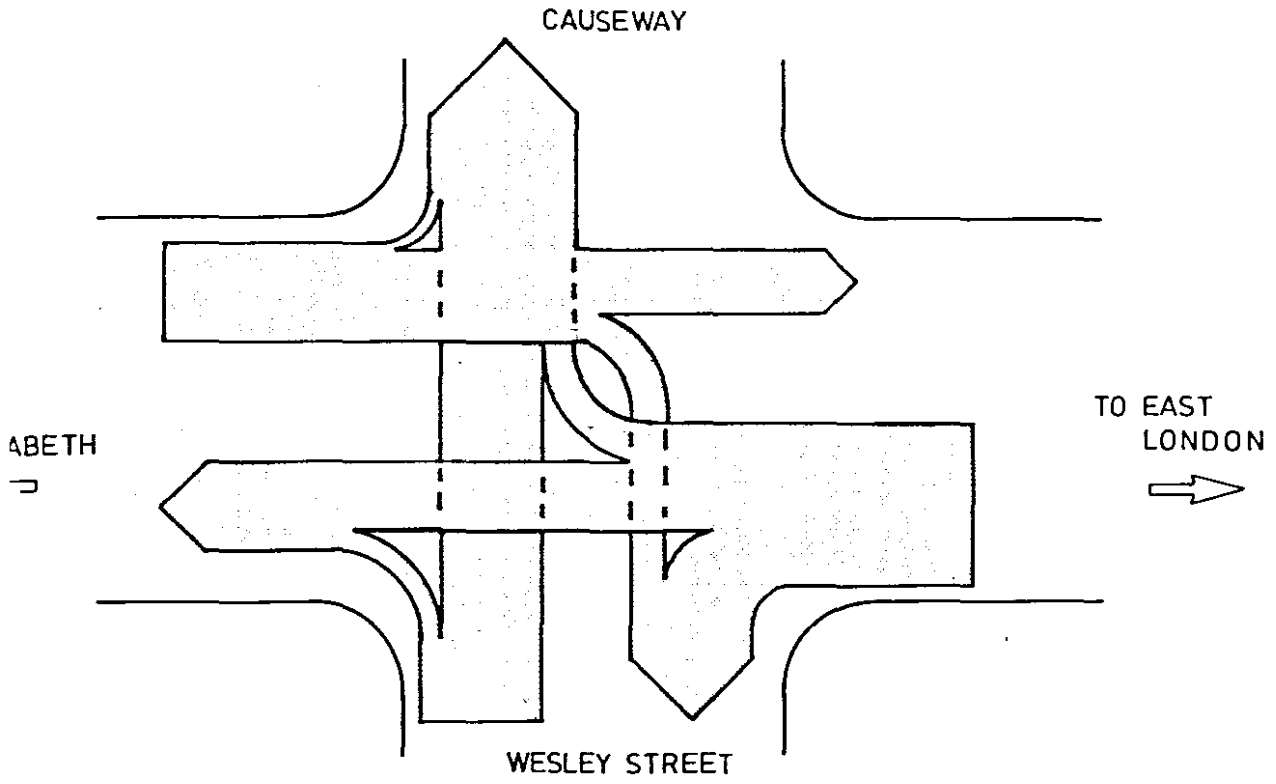
Traffic surveys carried out before and during the summer holiday periods of 1984 and 1988, respectively, are represented in Figure 5.17 .

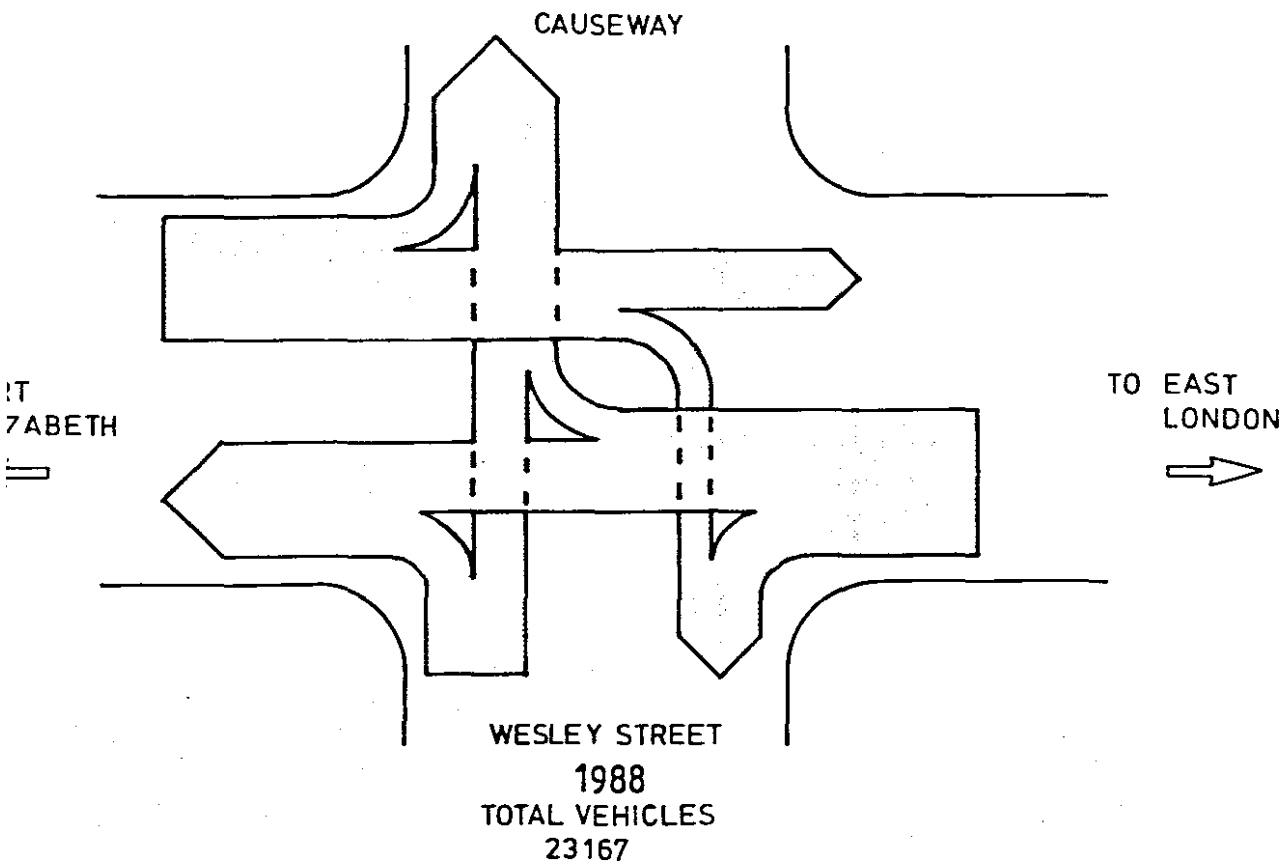
The total number of cars increases drastically once the holiday period commences (see total vehicle numbers) but the figures indicate that a large percentage of vehicles move from the beach side of the road to the central area irrespective of the time of year.

A further possible constraint to the economic development of the town and especially the marina is the lack of safe access into the river mouth.

The fishing industry in Port Alfred relies heavily on this access and although the local representative of the Port Alfred Fishermen's Association is of the opinion that an improvement in this regard will have little effect on that industry's income it is still a fact that a safer entrance will result in more days becoming available in which catches could be landed.

The yacht basin adjacent to the Royal Alfred Marina will also require safe access through the mouth if it is going





PORT ALFRED
TRAFFIC COUNT ANALYSIS

FIG 5.17

to attract international yachtsmen to its moorings. With this ongoing constraint it is seriously questionable whether the yacht harbour will be a viable enterprise.

6

E C O N O M Y

6.1 GENERAL

The economic constraints to development which face Port Alfred cannot be seen here in isolation but in a rather wider national spectrum.

With the present national economic depression caused, inter alia, by a falling Rand price in relation to the Dollar it is unlikely that Port Alfred will be able to create the much needed economic climate which would lead to improved prosperity amongst all of its inhabitants.

The peaks and troughs of the business cycles are relatively short-term phenomena. In the longer term, the growth of the town is related to the magnitude and nature of its economic base, made of a mix of primary (agriculture and fishery), secondary (production) and tertiary (business, commerce, administrative services) activities. Considering that the 'raison d etre' for Port Alfred is the holiday and tourist industry coupled to retirement, a lowered Rand value, in real terms, could adversely affect development. Although, with the removal of sanctions, a lowered Rand value could also see a boost in overseas investment.

It is felt that although methods of economic stimulation are beyond the scope of this report, particular economic

constraints endemic to Port Alfred should be discussed briefly.

6.2 PUBLIC SECTOR

One of the main burdens placed on the municipality is the upkeep of the uneconomical road system of the town caused by the present low density and sprawl of residential development. Along with this is the problem of water shortages which have required temporary relief methods in the past such as pumping water from below the dune areas.

The municipality's main income is in the form of taxes levied on properties in the area and as can be seen in Table 6.1 amounts only to some R 1,6 million.

With the completion of the Royal Alfred Marina the municipality will be able to levy taxes on a further 360 high value residential properties with the possibility of almost doubling its present yield.

MUNICIPAL VALUATION (R)				INCOME (R)
YEAR	SITE	BUILDINGS	TOTAL	YIELD
83/4	9291210	23648260	38939470	734005
84/5	10645870			968774
85/6	10591740	24056560	34648300	1143908
86/7	10936640	27294770	38231410	1312396
87/8	11010000	28800000	39900000	1628370

Non-Rateable valuations equal R 5295180 for 1987/88

RATES STRUCTURE AND INCOME

TABLE 6.1

Although the municipality's income will be increased the cost of providing an upgraded water supply for the town, water-borne sewerage, and upgrading of services in the Black township must not be underestimated. Although funding for Black townships is presently available from Regional Services Councils it is doubtful whether Port Alfred will be able to obtain a grant large enough to cover full expenses.

6.3 PRIVATE SECTOR

Port Alfred lacks the investment which is often provided by larger industrial companies. As previously mentioned the town lacks the incentives provided by neighbouring Independant States and will not easily attract industrial development from overseas countries such as Taiwan. As these large companies normally invest in upgraded housing for their employees the onus will fall on local employment possiblities and the local authority.

Private business in Port Alfred is mainly of a service nature with no large industries and one can therefore assume that profit margins are relatively small, especially considering the large seasonal influence on trade.

Capital for development seems therefore to be required from outside the region of the town.

6.4 EMPLOYMENT

From the above it is apparent that little can be done in

terms of employment opportunity where local business is concerned.

In a report prepared by the Institute of Planning Research of the University of Port Elizabeth it is suggested that the local authority and businesses attempt to create an atmosphere within which informal employment of the Black population can take place. The report, "An appropriate strategy to meet the basic needs of the poor in Port Alfred Black Township", proposes an initial "basic needs" approach to relieve the poverty in the township. In the conclusion of the report the following statement is made, "With the proper support the informal activities can be expanded to supply basic goods and services....." also, " The most viable strategy to meet the basic needs of the people in the Township will be to identify and support all informal activities in the Township. This strategy will not only be the least expensive, but will also be in line with what is understood by the term `real development' to integrate the people into society, instead of just keeping them afloat with tremendous welfare expenditure." (UPE Res. Rep No 29 - June 1984)

7

DEVELOPMENT PROPOSALS

7.1 GENERAL DEVELOPMENT PROPOSALS

The general development proposals for the urban area of Port Alfred are presented in the form of an Urban Structure Plan.

The purpose of a structure plan is defined in the Land Use Planning Ordinance, Ordinance No. 15 of 1985 as: "The general purpose of a structure plan shall be to lay down guidelines for the future spatial development of the area to which it relates (including urban renewal, urban design or the preparation of development plans) in such a way as will most effectively promote the order of the area as well as the general welfare of the community concerned."

This implies, although Section 4 (9) of the Ordinance is not explicit as to the environmental content, that all spectrums of the environment are to be considered.

A Structure Plan, unlike a zoning scheme, does not allocate to or remove rights from property. Zoning is, however, an important instrument in maintaining environmental quality in that it allocates specific use rights to property and take cognisance of the surrounding environment/activities.

A well ordered hierarchy of structure planning exists, with

the type of plan and the level of detail being determined by the size of the area concerned. These plans are Sub-Regional, Urban or Local and lead to more detailed Development Plans.

In order to enhance the environmental quality of Port Alfred it is necessary to consider all the unique aspects of the town and along with the constraints described in the previous section develop a structure plan which will lend a measure of "legibility" and environmental image. This structure plan will also provide guidance as to the future spatial development of the town.

It is believed that Port Alfred, because of its location within the flood plain of the Kowie River should as far as is possible develop in the direction of a water-orientated town. One in which the visitor is brought into constant contact with either the river or the sea in such a way that the general impression is of being surrounded by an aquatic environment.

This can, however, only realistically occur in the central area of the town and consideration must also be given to enhancing the urban areas on the two plateaux.

The perception of an urban environment by an inhabitant, according to Kevin Lynch, (Image of the City, Lynch K,1960) revolves strongly around the manner in which the environment is structured. "In the process of way-finding, the strategic link is the <u>environmental image</u>, the

generalised mental picture of the exterior world that is held by the individual".

The Urban Structure Plan presented in Figure 7.12 has been drawn up with not only the existing features of Port Alfred in mind but also includes a hierarchy of "paths" as suggested by Lynch - "The design of the paths should be in such a way that the whole is ordered or structured by the paths".

These paths have been determined in such a way as to create a series of districts each with it's own focal point or attraction.

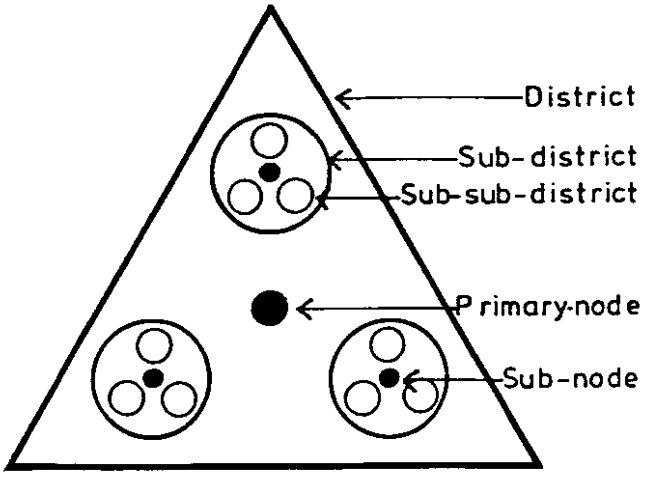
7.2 ROAD HIERARCHY

At the first glance of a plan of the area there does appear to be a simple system of road hierarchy but on ground inspection and considering the topography this system becomes less evident.

The fold-out Urban Structure Plan (Figure 7.12) indicates the roads that should be considered for upgrading in such a way that it is obvious to the visitor that these are of greater importance than others.

The first level of the hierarchy is formed by the R27 and R67 major arterial roads with an extra link formed between them by Main Street over the Putt Bridge. It is felt that this connection is desirable in order to enhance the "activity spine" as shown in the Central Area Master Plan

(Plan Associates, 1987) and draw what would perhaps have been through traffic into the business district. At present no commercial activities exist in the central area along the R27.



SCHEMATIC STRUCTURE PLAN

(based on desciption by Kevin Lynch)

FIGURE 7.1

Progress has been made in upgrading the visual quality of Main Street by the planting of trees to form an avenue and repaving the sidewalks as suggested in the Master Plan.

The second level of roads or major distributors involve the upgrading of existing streets in such a way that their importance is easily recognisable. It is suggested that these roads should have paved sidewalks and street lighting in order to reinforce their prominence.

As can be seen in Figure 7.12 these are the roads which give structure to the districts surrounding the river as well as giving clear and direct access to the areas

identified as focal points or activity points.

A further distributor is suggested to structure the future peripheral urban development on the western fringe of the town as well as two proposed roads on the eastern bank. One of these to provide access to East Beach and the proposed small craft harbour and the other to create accessibility

MAIN STREET UPGRADING

FIGURE 7.2

to the proposed industrial areas from the Black and Coloured townships. This road may require the construction of a bridge over the railway line to comply with South African Transport Services regulations concerning level-crossings.

7.3 URBAN DEVELOPMENT

7.3.1 STRATEGY

The strategy towards urban development should be one of filling in existing un-utilised residential erven before further peripheral development is encouraged.

The present residential areas, particularly on the western edge are of an extremely low density thereby raising the cost of road and essential service provision.

In order to alleviate the cost of services and concentrate development in established areas incentives in the form of lowered tax structures for erven nearer the core could be introduced with time restrictions on completion of dwellings or oppositely, increasing taxes and rates for erven on the periphery. It is economically unsound to allow the development of residential sprawl and low densities.

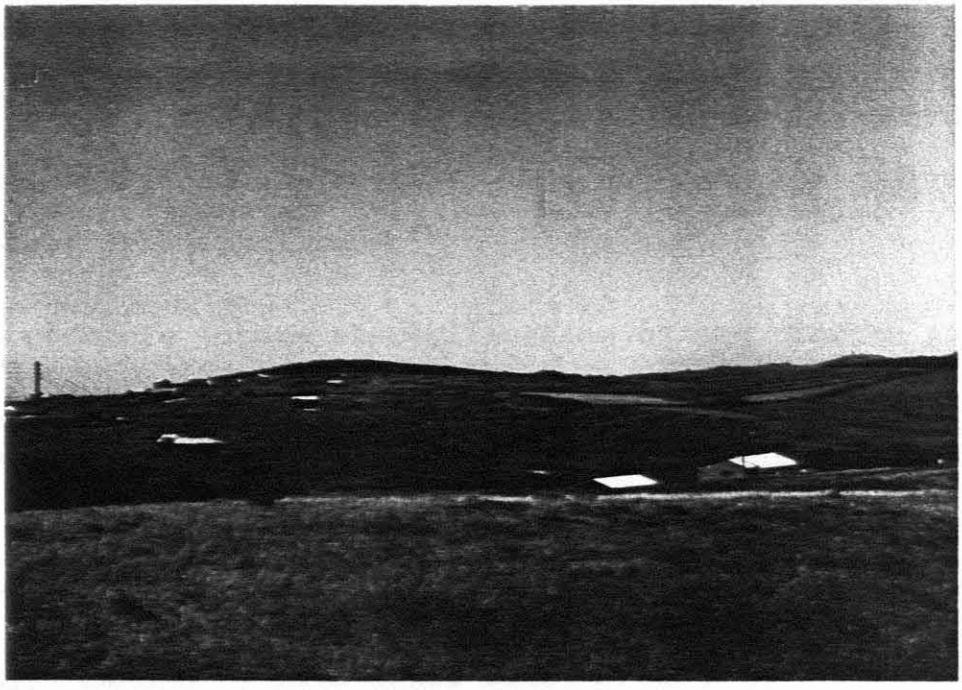
The constraints identified through the application of overlay maps and summarised in Figure 5.8 need also to be considered in the preparation of a Structure Plan.

7.3.2 OPPORTUNITIES AND CONSTRAINTS

The limitations considered recommended for residential development are indicated in Figure 7.12 and are determined in the following way:

Development to the west has already proceeded further than is desireable and the limit set has included that already

built. As can be seen in Figure 7.3, the residential component of the town has started to infringe on agricultural land to the west. This is probably caused by speculative land sub-division and should be strictly controlled.



PERIPHERAL RESIDENTIAL DEVELOPMENT

FIGURE 7.3

On the northern side of the R72 development should be contained to prevent infringement into agricultural land and the sensitive water run-off areas which exit into the ravine. Run-off from residential areas can be considerably higher than from natural veld because of the increase in impervious surfaces such as roofs and paving. A danger would therefore exist of soil erosion if uncontrolled and that pollution levels in the Kowie could increase

detrimentally.

This is also a major consideration in the limiting of growth of the Black Township which because of it position and elevation already poses such a pollution hazard, especially as no waterborne sewerage system is in existence.

Development of the township should therefore be towards the north and if necessary across the R67 onto the flat under-utilised land opposite.

The possible future electrification of the township will also be facilitated with minimum expenditure as the major power supply line enters Port Alfred alongside the R67 as can be seen in Figure 5.11.

The constraint on residential development to the east is mainly caused by sand dunes which should be maintained in their natural state. However, to make the proposal to increase accessiblity to the river mouth financially feasible a certain level of trade-off will be required as indicated and could well enhance the area if carefully undertaken. Development should only be allowed to take place on the landward side of the dune peaks with due consideration to stabilisation during development to ensure that the change to the environment is positive and with insignificant impact.

7.4 INDUSTRIAL DEVELOPMENT

The importance of the provision of employment for the Black population of Port Alfred cannot be over-emphasised and considering the unemployment levels running at 64% economically not active, and a schooling level where 91,78% of the population have a lower than Standard 6 education, industries which are labour intensive and use mass-production will most likely have to be encouraged.

Even if large scale development were to take place in the tourist industry it would not be possible to provide sufficient employment in these service sectors and the potential for the informal sector is extremely limited.

The need for labour-intensive or manually-operated production-line type factories therefore exists.

Major problems of most of the production-line type of factories are that they are land consumptive, require electrical or other power sources and although they may not be of the "noxious" type, they can contribute to increased levels of pollution.

Considering Figure 5.11 - Opportunities and Constraints, it becomes apparent that the area to the north east of the town is most suitable for industrial development.

The area available is not high quality agricultural land, has a slope of less than 1:30 (Figure 5.7) and is situated on the plateau between the ravines of the Kowie and Rufane

rivers.

Proximity to the R 72 and R 67 as well as the Port Alfred / Grahamstown railway line give the site good accessibilty.

It is also easily accessible to the potential labour force being adjacent to both the Black and Coloured townships.

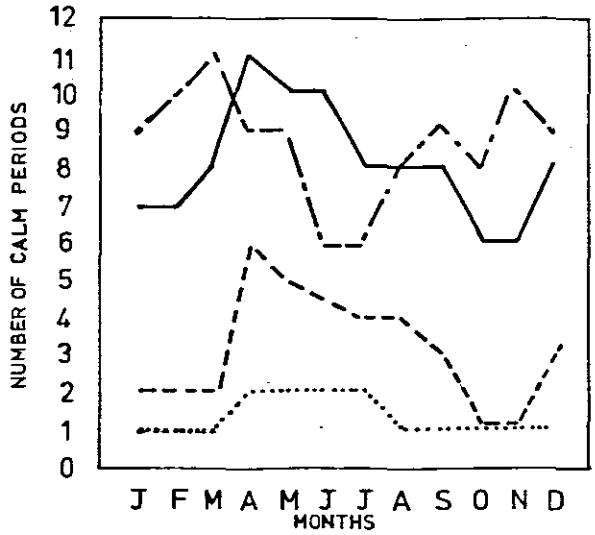
The main electricity power line to Port Alfred also runs adjacent to the proposed area.

The environmental problems which could accompany such a development are seen to be potential air and water pollution.

The possibilty of air pollution is elevated during calm periods or windless days which could occur during April and June (Figure 2.7 - Climate - Wind Occurrence). During the rest of the year most air pollution will be dissipated by the prevailing westerly and easterly winds.

On windless days, the pollution would rise above the site remaining more or less stationary until evening when catabatic or topographically-induced winds will induce the pollution to descend and drift into the river valleys before slowly dissipating seawards. This is represented diagramatically in Figure 7.4 .

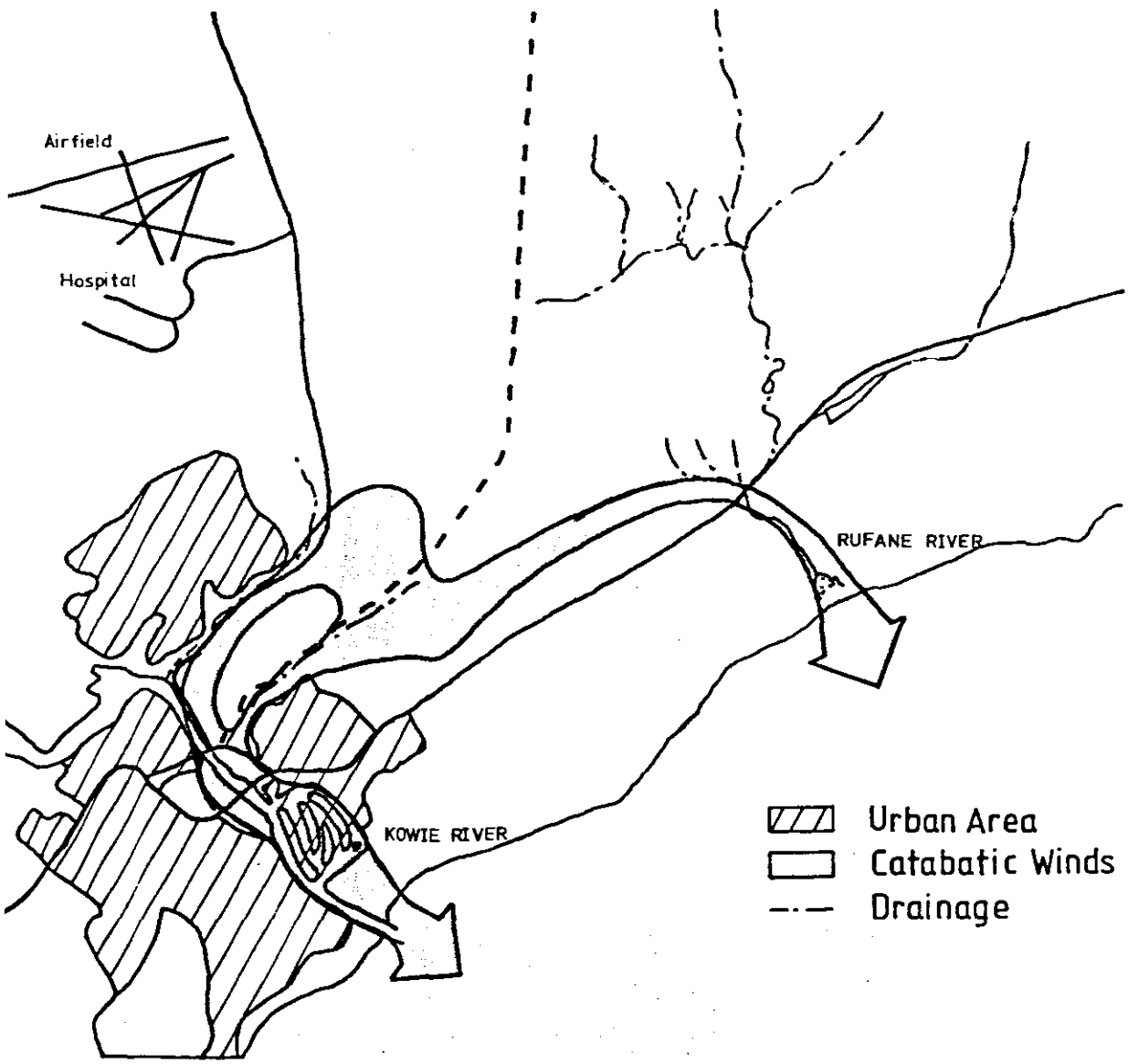
There is also a danger of polluted water (industrial effluent) reaching both the Kowie and Rufane rivers. This could occur due to the elevation of the site and the fact



SOURCE : Forest Research Station
Bathurst

CALM MORNINGS
CALM DAYS
CALM AFTERNOONS
TOTAL CALM PERIODS

Calm Period Trends



PORT ALFRED

FIG 7 4

that the predominant natural drainage channels to the two rivers reach the peripheral of the site. (Figure 5.8)

The drainage of potential water pollutants is also shown in Figure 7.4.

It is also feasible to utilize several of the old buildings located at the airfield for small industrial development.

7.5 AIRPORT

The development of the Royal Alfred Marina and further possible tourist industry expansion will enhance the airport's importance as a point of access. It is envisaged that the airport could form a major link to the PWV area and other main centres not only for Port Alfred itself but also to the Fish River Sun Casino / Hotel.

Since the middle of 1989 the airport has seen renewed activity with the establishment of a pilot training centre which is set to become one of the major centres of this type in South Africa.

However, on the perimeter of the airfield there are several unused, delapidated buildings which could be utilised by small entrepeneurs as industrial buildings without adversely affecting the operation of the airport.

7.6 AREAS OF HISTORIC SIGNIFICANCE

The areas of historic significance are discussed briefly below and are identified on the Urban Structure Plan (Figure 7.12) by the last digit of the sub-heading number.

7.6.1 WHARF STREET

This area comprises of several warehouses built around 1845 and constructed of dressed stone and Welsh slate. They have been in constant use since construction and are presently used mainly as shops.

WHARF STREET SHOPS

FIGURE 7.6

7.6.2 PORT CAPTAIN'S OFFICE, MILL AND MONOLITH

The Port Captain's office built during the shipping days of

Port Alfred is a simple square structure and was used as a cafe in the 1920's. It was later used by the NSRI and is presently a private dwelling.

The Port Francis Mill went into production in 1850. After the lack of trade it became vacant and was then used as a grocery shop during the 1920's. It was recently purchased and used as a holiday home with the only remaining evidence, the boilers, evident next to the Port Captain's Office.

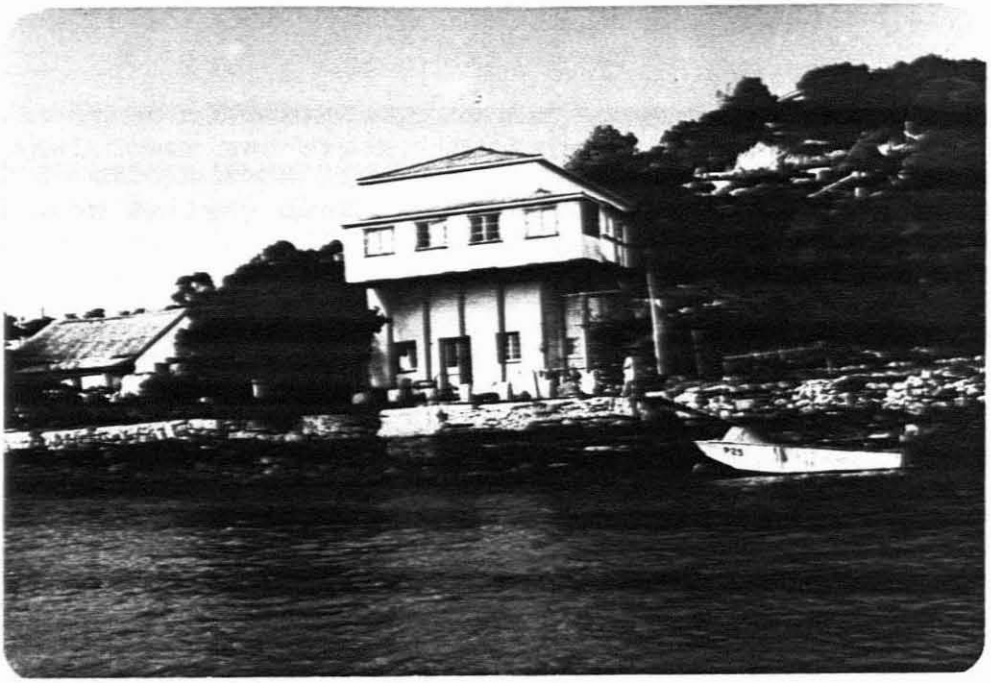
A monolith standing near to the Port Francis Mill indicates the position where the 1820 Settler wagons crossed the Kowie River moving eastwards. The river estuary was wide and shallow at this time.

7.6.3 RICHMOND HOUSE

An imposing building commonly known as "Cock's Castle" constructed by William Cock in 1840 and used as a private home as well as a refuge during skirmishes in the 19th century. Now owned by Mrs Gemmil as a private residence.

7.6.4 METHODIST CHURCH

Built on ground opposite Richmond House in Wesley Street which was donated by William Cock. The church was constructed in 1865.



PORT CAPTAIN'S OFFICE AND MILL

FIGURE 7.7

7.6.5 SETTLERS' CHURCH

Situated in Bathurst Street and built by James and Alexander McPhail in 1827. The chapel burned down during the 6th Kaffir War in 1834 and was rebuilt in 1840. It was again demolished in 1846 during the "War of the Axe" by fire. Rebuilt in 1850 with an iron roof which replaced the original thatch. The church was declared an Historical Monument in 1938 with final restoration being completed in 1968. Declared a National Monument in 1974.

7.6.6 RAILWAY STATION

The railway station was built circa 1884 when the railway between Grahamstown and Port Alfred was completed. A substantial building of the Victorian style built of dressed stone. The present roof, as shown, replaced the

original tower and clock. Declared a National Monument in 1984 when Railway centenary was celebrated.

7.6.7 CONVICT STATION

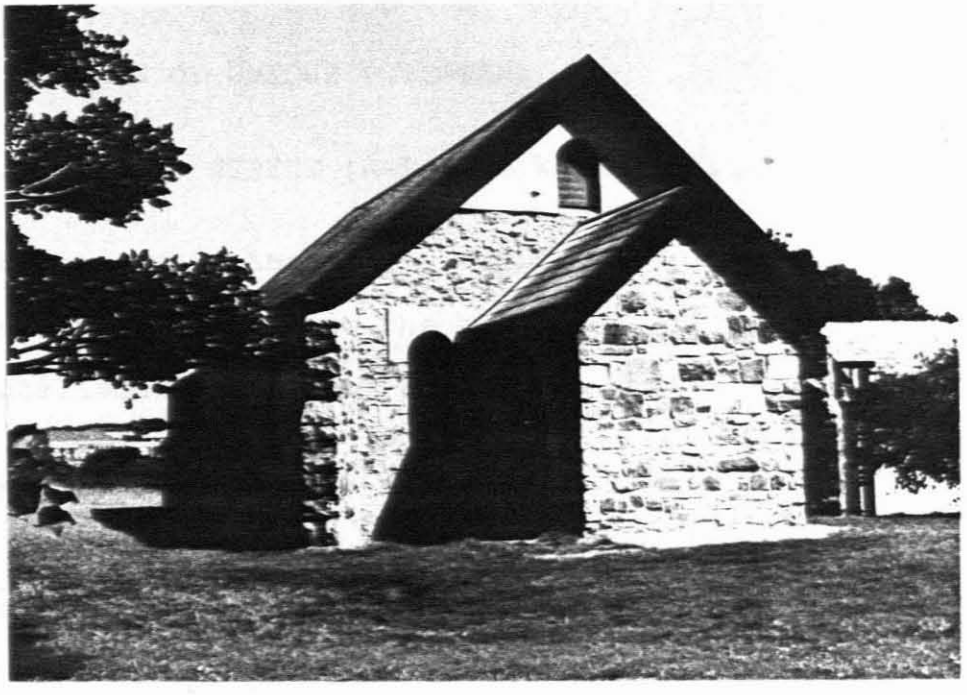
The present river banks were constructed by convict labour circa 1850. The buildings are some of the earliest in the then Port Francis. When construction on the piers was halted, around 1889 the buildings were used as a mental asylum which was closed in 1987. The buildings are presently used as clinics and the proposed hospital will be built on this site in the near future, incorporating some of the historic buildings.

RICHMOND HOUSE

FIGURE 7.8

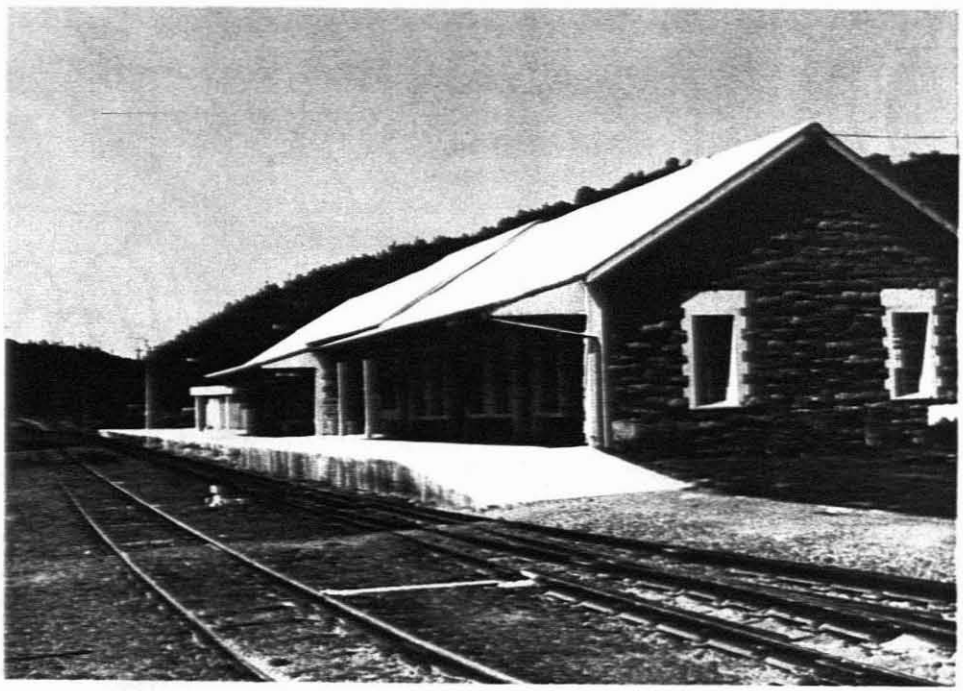
METHODIST CHURCH

FIGURE 7.9



SETTLERS' CHURCH

FIGURE 7.10



RAILWAY STATION

FIGURE 7.11

7.7 AREAS OF UNIQUE POTENTIAL

7.7.1 WHARF STREET (Refer to No 1 in Figure 7.12)

With the completion of the Wharf Street by-pass along Bank Lane the area between the buildings and the river bank can be utilised as a mainly pedestrian area.

To enhance the quality of the area the buildings will have to be upgraded and tourist related activities included within the established commercial activities. The historic value of the buildings must be considered and therefore the quaintness of the area will be maintained.

AIRPORT TO DEVELOP AS
- Major aircraft training centre
- Air link to PWV and PE (for local tourists and Fish River Sun resort)

R67 TO GRAHAMSTOWN

TOWNSHIP EXPANSION

OPEN VELD WITH INFORMAL GRAZING

INDUSTRIAL DEVELOPMENT

RAIL LINK

Port Alfred Grahamstown railway line

ROAD BRIDGE

INDUSTRIAL DEVELOPMENT

25 km ⇨
FISH RIVER SUN HOTEL/
CASINO RESORT COMPLEX

EXISTING INDUSTRIES

R72 TO EAST LONDON →

AGRICULTURE

AGRICULTURE

AGRICULTURE

AGRICULTURE

← TO PORT ELIZABETH R72

K O W I E R I V E R

DEVELOPMENT

LIMIT ON PERIPHERAL RESIDENTIAL

Main Road

Alfred Road

Bathurst Street

Gilbert Street

Causeway

KIDDS BEACH

MARINA

Wesley Hill

Lambert Road

Saltvlei Road

RESIDENTIAL DEVELOPMENT

Shifting Dunes

ROYAL (PORT ALFRED GOLF COURSE

KELLY'S BEACH

West Beach Drive

West Beach

East Beach

PROPOSED SMALL CRAFT HARBOUR AND BREAKWATER EXTENSION

I N D I A N O C E A N

LEGEND

- MAJOR ARTERIAL
- MAJOR DISTRIBUTOR (To be upgraded)
- PROPOSED MAJOR DISTRIBUTOR
- DEVELOPMENT LIMIT
- URBAN GROWTH
- INDUSTRIAL GROWTH
- BEACH ACCESS
- P PARKING
- 1 AREAS OF HISTORICAL SIGNIFICANCE (NUMBERS REFER TO TEXT)
- 1 ACTIVITY or FOCAL POINTS (NUMBERS REFER TO TEXT)
- PROPOSED PEDESTRIAN PROMENADE
- AREAS OF UNIQUE POTENTIAL
- FLOOD PLAIN TO BE PROTECTED
- AREAS TO BE MAINTAINED IN EXISTING STATE or PROTECTED
- MAJOR WATER RUN-OFF CHANNELS

REFER TO TEXT FOR FULL EXPLANATION OF ABOVE ASPECTS

CONTOURS AT 20m INTERVALS

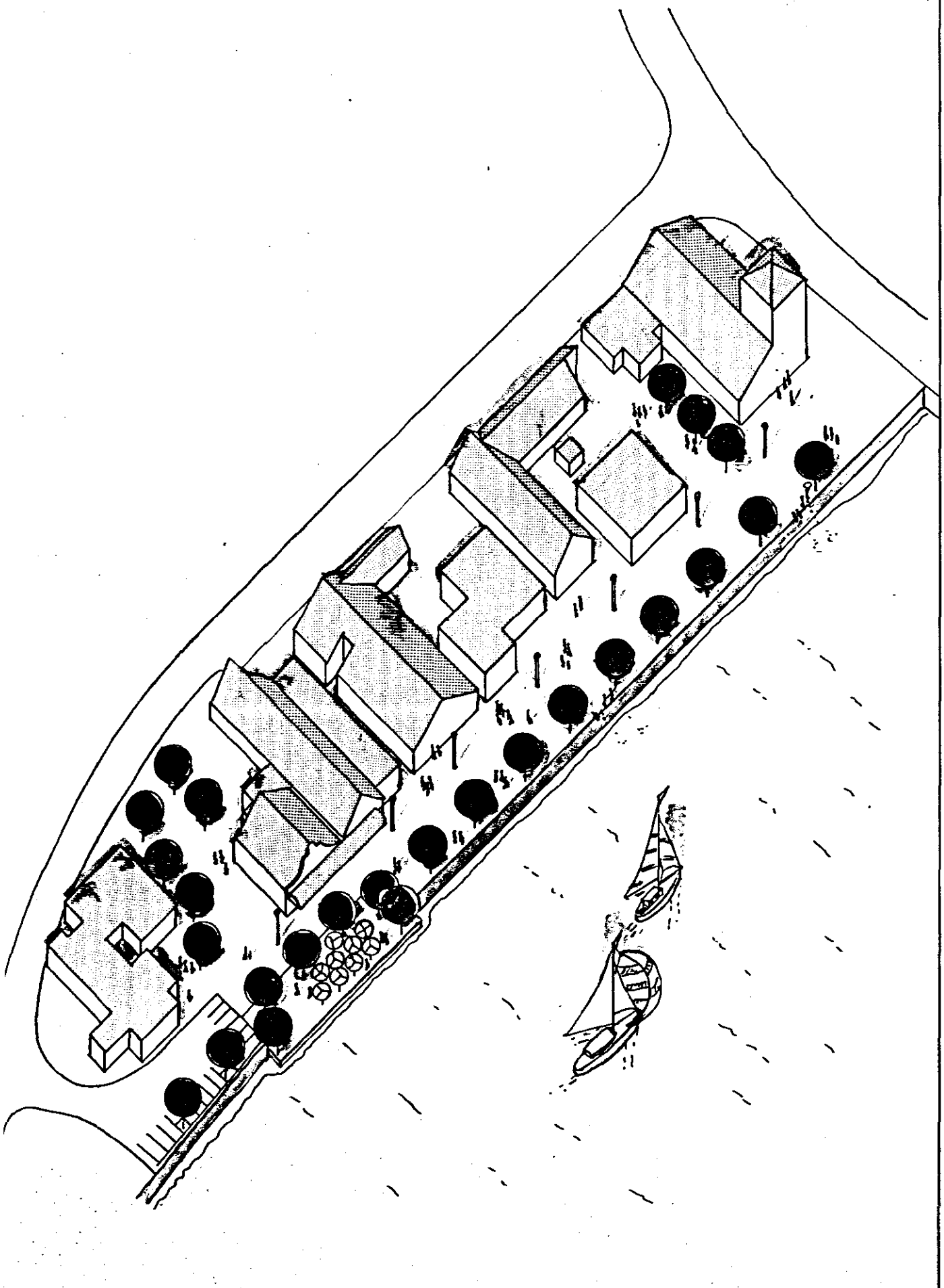
URBAN STRUCTURE PLAN

Base Source : Orthophotos 3326 DB8 & 9

PORT ALFRED

SCALE 1:10 000

FIG 7.12



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WHARF STREET PROPOSAL

FIG 7.13

Figure 7.13 gives an indication of a conceptual upgrading in which the old road has been paved and trees introduced along the waterfront. Access to the area for the removal of fish catches which takes place at present will be obviated by the proposal to centralise the fishing industries activities in the Upper East Bank Lagoon as discussed in 7.7.6.

Although the area is traditionally used by the Black township population for shopping it is foreseen that tourist appeal can be enhanced by permitting informal businesses such as the sale of traditional African curios (hand-made bead work etc.) from pavement stalls within the upgraded area.

The quality of the vista from the opposite side of the river will also be enhanced as can be seen in the before and after comparison of Figures 7.14 AND 7.15 .

7.7.2 MUNICIPAL LAGOON (Refer to No 2 in Figure 7.12)

The area known as Municipal Lagoon is a large tract of land to the south of the central business area. A portion of the land is flooded daily at high tide.

The area above high water is municipal land, zoned for "Amenity" use.

This area is extremely accessible from Main Road via Masonic Street and Biscay Road and should be developed in keeping with the water-related atmosphere of the town.

It is the ideal location for small restaurants and bistros which are at present lacking (the only waterfront restaurant, a coffee shop, is located on the west bank of the river). The atmosphere that could be created would be synonomous with seafood restaurants.

In order to develop this theme to its full potential it may be necessary to dredge part of the lagoon so that it will remain filled even at low tide. The environmental impact of this proposal will be low as the lagoon cannot be considered as an important wetland due to it's isolation from the main river. The flow of tidal water is restricted to a single culvert which passes below the R 72 and therefore the lagoon cannot be considered as a major producer of juvenile fish.

PRESENT VIEW

FIGURE 7.14

KOWIE RIVER

SKI-BOAT CLUB

TENNIS CLUB

BOWLING CLUB

SOUTHWELL ROAD

CARAVAN PARK

MAIN ROAD

MUNICIPAL BUILDINGS

LIBRARY

CAUSEWAY

Municipal Lagoon

Shopping Centre

SOUTHWELL ROAD

P

LEGEND

- Existing buildings
- Proposed buildings
  CENTRAL AREA MASTER PLAN 1987
- Proposed restaurants & novelty shops
- P Parking
- Natural public open space
- Proposed promenade
- Riverside promenade
- Major access points
- Views to and from the site
- Conection with CBD

PORT ALFRED

MUNICIPAL LAGOON

LOCAL STRUCTURE PLAN

SCALE 1:20 000

FIG 7.17

Even after dredging, the lagoon will still fall under the influence of the tide and sections away from the development towards the R 72 will maintain tidal beaches which will provide sufficient feeding ground for aquatic bird species.

Figure 7.17 shows a conceptual Local Structure Plan for the Municipal Lagoon site.

7.7.3 WEST RIVER BANK (Refer to No 3 in Figure 7.12)

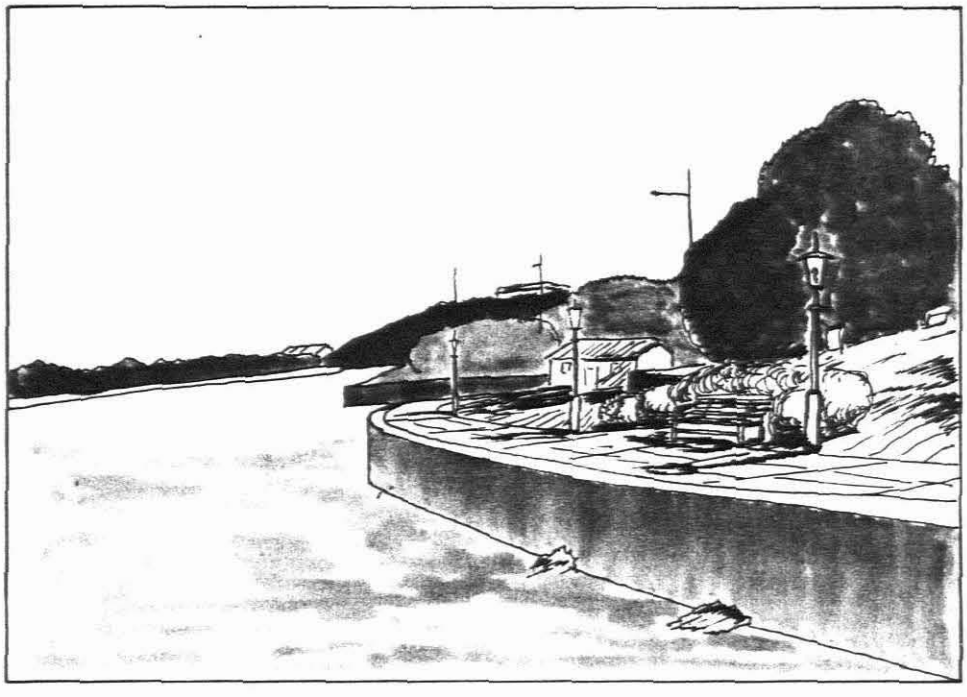
The western bank of the river can be seen as a potential pedestrian link between the central part of Port Alfred and and the beach area. This would extend from the west bank shopping centre and coffee shop (Figure 7.18), opposite Wharf Street, along the channelised bank, under the Nico Malan bridge (R 72) past the camp site (Concept shown in Figure 7.19) to West Beach which is seen as a potential activity point.

En route the promenade would pass the historic Port Captain's house and Mill as well as the monolith indicating the position where the 1820 Settlers crossed the Kowie.

The promenade would be approximately 2 km long, located in a strip of municipal land zoned for "Amenity" use except where it passes the Port Captain's house and Mill where it would be located within the road reserve. With subtle lighting it could be used both during the day and evening.

WEST BANK SHOPPING CENTRE

FIGURE 7.18

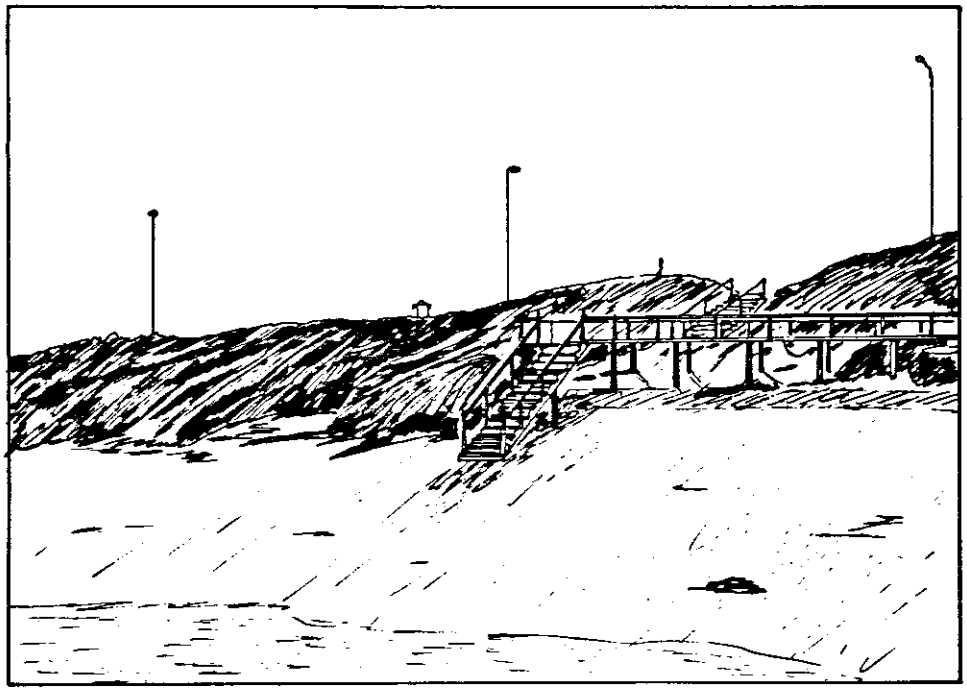


PEDESTRIAN WALK CONCEPT

FIGURE 7.19

The dune area between West Beach and Kelly's Beach must be maintained in a stable condition to prevent movement due to wind which causes sand inundation of West Beach Drive.

With upgraded facilities at these two beaches it is foreseen that access across these dunes could become problematic. In order to obviate this problem it is suggested that elevated walkways are provided. These could take the form of paths from West Beach Drive perpendicularly onto the beach or preferably a continuation of the promenade between the two beaches as proposed in Figure 7.20 .



BEACH PROMENADE CONCEPT

FIGURE 7.20

7.7.4 WEST BEACH (Refer to No 4 in Figure 7.12)

West Beach, in the vicinity of the parking area, is at present under-utilised and undeveloped (Figure 7.21). It is one of the two ideal locations for concentrated bathing activity.

At present the time-share and condominium developments (background in Figure 7.21) overlook a relatively desolate beach environment. Stabilisation of the dunes and landscaping of the parking area along with upgraded beach cafe and ablution facilities will greatly enhance this area.

WEST BEACH

FIGURE 7.21

However, before extensive planning or construction work is carried out here it is important that a decision be reached concerning the extension of the west pier or breakwater.

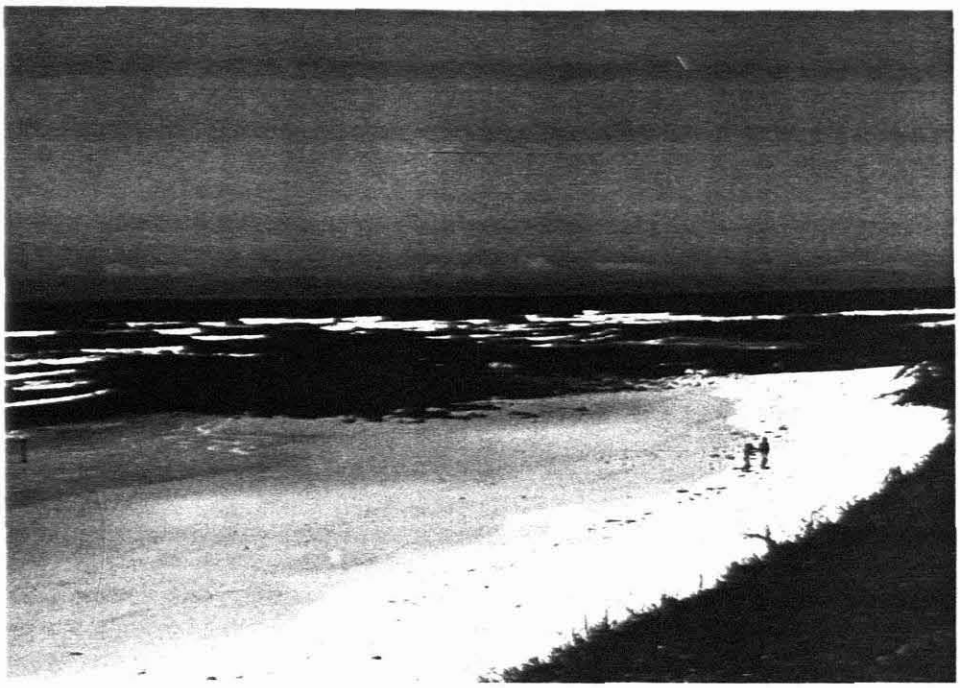
Should the breakwater be extended the longshore littoral drift will move further out to sea as it rounds the extended tip causing a change in the pattern of sand deposition onto West Beach. This should have the effect of increasing the beach width and synergistically the stable dune area will increase. (Unpublished research carried out by the Cape Provincial Administration at the hydraulic laboratory of Stellenbosch University.)

The amount of land above the high water mark available for beachfront development could increase substantially over a period of several years.

7.7.5 KELLY'S BEACH (Refer to No 5 in Figure 7.12)

Kelly's Beach is the second and most popular bathing beach in Port Alfred due to its sheltered location in the lee of the rocky Soutvleipunt. This rocky promontory causes the waves to break prematurely and to deposit sand in the lee of the rocks.

Figure 7.22 shows the beach area and rocks as viewed from the parking area. As can be seen access to the beach is restricted due to the steepness of the dune.



KELLY'S BEACH

FIGURE 7.22

It is felt that this beach should remain in its natural state as far as possible with only the provision of a good access point down the dune and well-located ablution facilities.

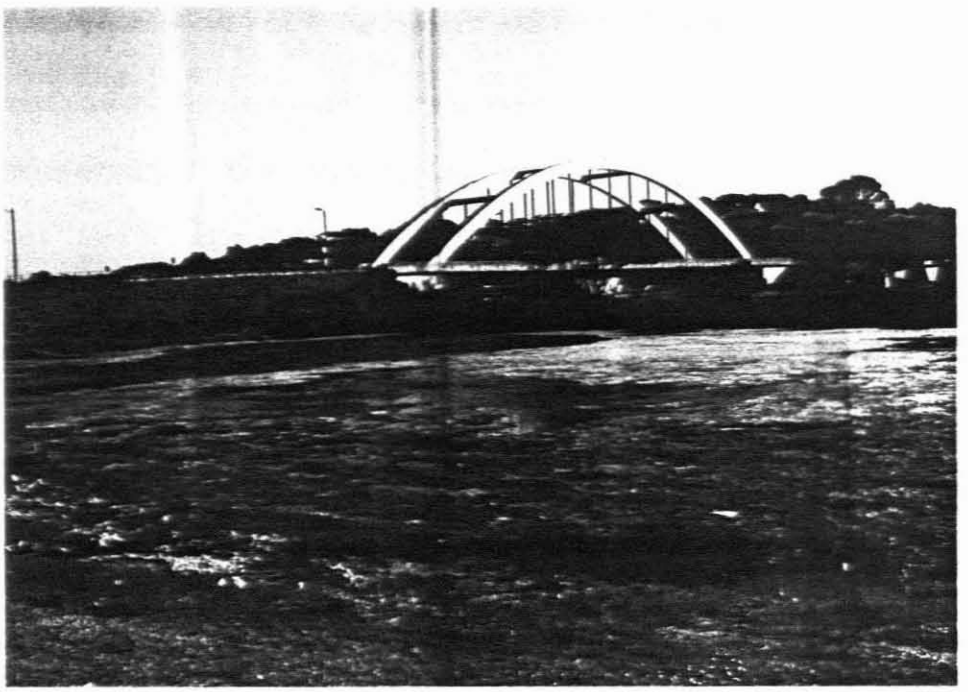
It is possible that the access point could be incorporated in the proposed promenade (Figure 7.20).

7.7.6 UPPER EAST BANK LAGOON (Refer No 6 - Figure 7.12)

The upgrading of Wharf Street will make the off-loading of the fish in that area problematic. At present the fishing craft are moored in the river opposite Wharf Street making access to them difficult and creating an obstruction to river users.

The Upper East Bank Lagoon is in an unhealthy state, cut off from the main river by the channelisation and covered with floating algal bloom (Figure 7.23). This eutrification can be attributed to run-off containing elevated levels of nitrogen and over time causes the de-oxygenation of the area.

The utilisation of this lagoon for a fishing craft basin, dredged and open to the river will have no detrimental impact on the environment and could, as is the case with the marina, initiate an improvement.



UPPER EAST BANK LAGOON

FIGURE 7.23

The provision of improved fish off-loading facilities and good access to the boats will be of benefit to the industry as well as creating an interesting environment for visitors

during the off-loading and sale of fresh fish. At present no fish may be sold at the offloading point because of congestion in the immediately adjacent road reserve.

The provision of on-site cold storage and sales point will complement the municipal market which is adjacent to the site.

7.7.7 MARINA HOTEL SITE (Refer to No 7 in Figure 7.12)

The site adjacent to the R 72 is extremely important from a visibility point of view. Its prominence is of particular note when descending into the ravine from the East London side on the R 72.

Unfortunately, the entire marina site has been fenced with electrified wire which detracts from its aesthetic value and intrudes on the openess of the river environment. The developers have obviously considered this level of security and the accompanying costs necessary but it is suggested that a serious attempt be made to lower the visual impact through the use of landscaping.

The hotel itself and the accompanying small craft harbour are outside of the marina security area (Figure 7.24) and it is felt that the adjacent land could be used for amenities for the local inhabitants as well as visitors.

The original proposals for the marina site included a series of public swimming pools and related facilities

which were to replace the childrens' swimming area in the Blue Lagoon. It is suggested that this proposal again be considered to provide public amenity in what is otherwise private marina area.

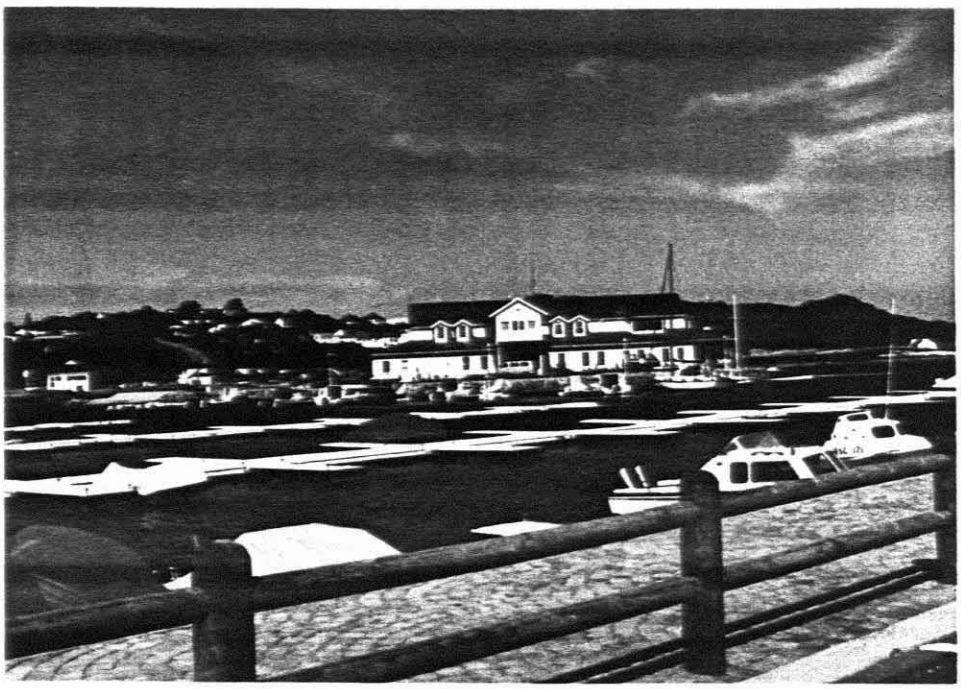


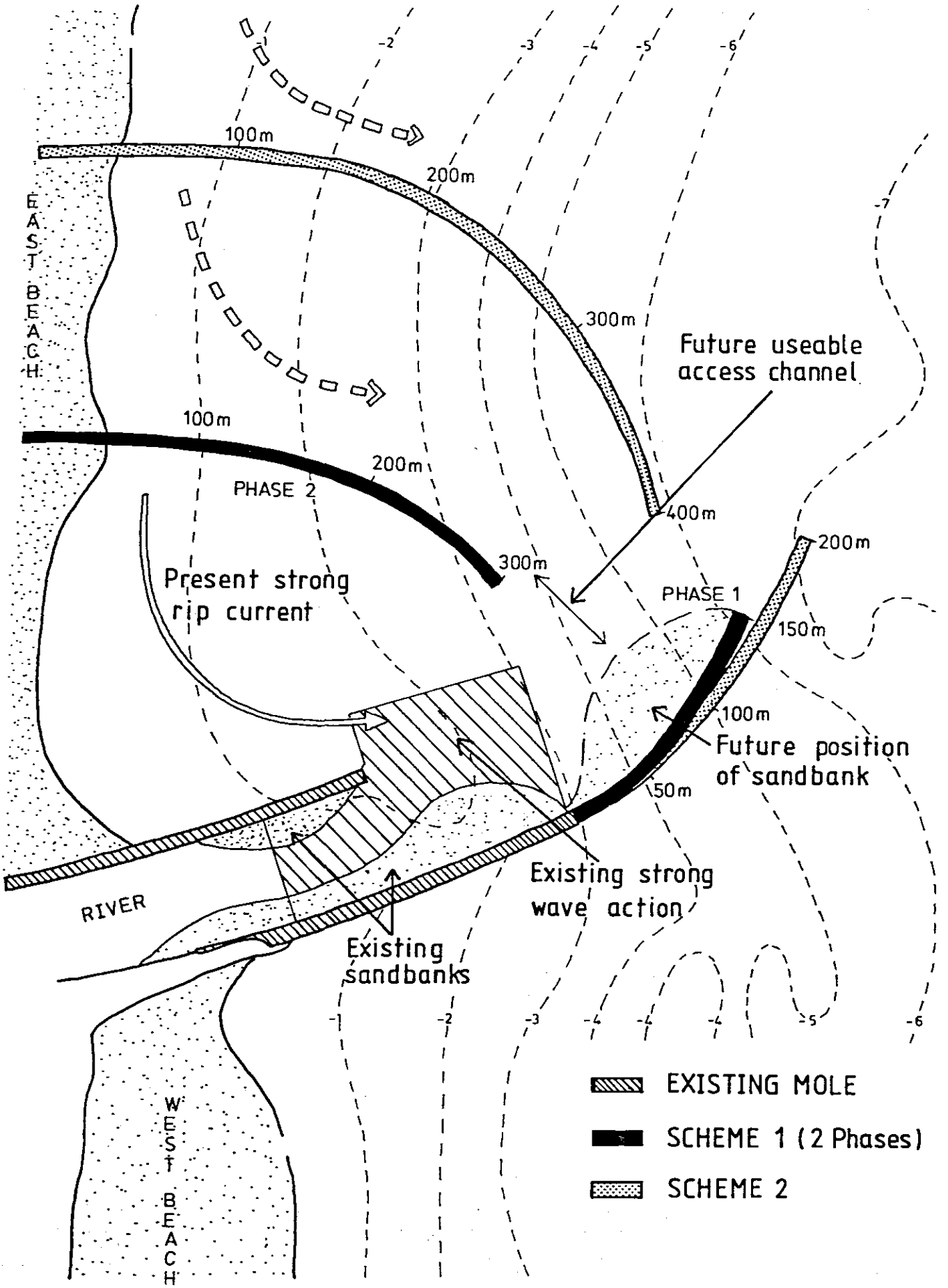
FIGURE 7.24

7.7.8 PROPOSED HARBOUR SITE (Refer No 8 - Figure 7.12)

The Coastal Structures Division of the Cape Provincial Administration has recently completed an investigation into the extension of the river mouth breakwaters to improve the safety of the entrance. (Figure 7.25)

In considering the expense of this extension it was felt that in order to recoup some of the expenditure a small craft harbour could be included in the proposal.

Refering to Figure 5.11 it can be seen that the area



Source: C.P.A-COASTAL STRUCTURES DIVISION

PORT ALFRED

PROPOSED HARBOUR

FIG 7.25

concerned falls within a minimum constraint zone and it would therefore be possible to provide residential development which would link the residential components of the marina and the proposed harbour over the dunes. These properties would be afforded either a good view over the marina or the sea depending on their position.

Access can also be provided from the existing residential areas on the hill to the east of the marina and the R 72 with the road running along the back of the high dunes as shown in the Urban Structure Plan (Figure 7.12) and controlled development zone (Figure 5.11).

It is felt that this small area of dune seaward of the marina is less sensitive than those to the east and they have already been used to create two parking and access points as well as being substantially changed during the marina construction.

Care will, however, need to be exercised during any construction work to ensure that the sub-surface vegetation which binds the dunes is disturbed as little as possible.

Management of the construction phases will need to be carried out to ensure that no permanent environmental damage occurs.

8

MANAGEMENT PROPOSALS

8.1 MANAGEMENT OBJECTIVES

The spatial planning of land-uses and activities, because of its very nature, involves the introduction of environmental change.

It is therefore of importance that authorities recognise the vital role that they play in the maintenance of environmental quality and that this maintenance relies heavily on the formulation of an applicable policy with regard to the management of the environment.

Such a policy should co-ordinate and integrate development in sympathy with the natural and built environments in such a way that environmental considerations become an integral part of the development.

This policy should be applied at all levels of the planning process and be included in the implementation of the structure plan (Figure 7.12) when considering relationships between land-use, zoning, design guidelines of buildings and structures, pollution control and the provision of infrastructure.

Within this policy, the maintenance of natural ecosystems and cultural heritage are of extreme importance as well as

the involvement of the inhabitants.

The formulation of priorities, methods of financing, development control measures and monitoring processes all fall within the sphere of such a policy and, if necessary, existing methods will need to be re-evaluated in order to implement a new strategy.

In order to implement an environmentally sound development policy it is necessary that the authority:

- recognise that conservation is relevant to all environmental regimes and not just to nature conservation
- recognise that an environmental policy needs to be comprehensive and also needs to consider the socio-political and economic issues involved
- institute a strategy whereby more and earlier consultation between interested parties can take place thereby minimising conflict
- maintain a management flexibility so as to adapt to changing needs and circumstances
- introduce a method of screening development proposals (discussed in Section 9) to ensure that all environmental problems can be anticipated both in the short and long term
- ensure that this process is made well-known and implemented at all application levels

- ensure that development proposals, especially those where environmental issues are involved, are made known to the public to ensure that all interests are considered.

8.2 DETERMINING PRIORITIES

It is not the object of this report to prescribe priorities but rather to investigate the criteria upon which such priority determination should take place.

In considering reports from the Algoa Regional Services Council (Dept. of Engineering Services, 1987) and Plan Associates (Proposal to Convert the Existing Airfield into an Industrial Park and Mixed Use Area, 1985) concerning the needs of the population of Port Alfred it becomes apparent that the needs of the different population groups differ in priority.

The 5 major priorities set by the Municipality for the town were the provision of water-borne sewerage, improvement of water reticulation, municipal street and surface drainage improvement, street lighting and recreational facilities, respectively.

The Management Committee for the Coloured population group listed their priorities as water reticulation, provision of water-borne sewerage, upgrading of streets, provision of recreational facilities and lastly stormwater drainage.

A survey amongst the residents of the Black township is shown in Table 8.1 in which the provision of adequate

housing ranks highest in priority.

Although the provision of recreational facilities ranks sixth on the priority list a serious lack of these facilities exists. (Figure 8.1)

The determination of priorities will have to include the needs of all population groups but in the interests of long term conservation certain environmental considerations will need to take priority.

The provision of water-borne sewerage to all areas of the town will need serious consideration to ensure that pollution of the ground water and subsequent leaching into

IMPROVEMENT REQUIRED	PRIORTY No 1	2	3	TOTAL	TOTAL WEIGHT	RANK
ROADS	29	59	42	130	247	3
HOUSES	85	44	25	154	368	1
MEDICAL	2	6	6	14	24	8
WATER	13	26	13	62	114	5
TENURE	5	6	7	18	34	7
STREET LIGHTS	52	32	44	128	264	2
EMPLOYMENT	32	22	16	70	156	4
RECREATION	5	4	12	21	35	6
OTHER	47	51	47	145	290	*
TOTAL	270	250	222	742		

BLACK POPULATION - NEEDS PRIORITIES

TABLE 8.1

LACK OF RECREATIONAL FACILITIES

FIGURE 8.1

the river does not occur.

In the case of the high-lying areas, especially the Black and Coloured townships where not even septic tanks are installed on many of the erven, the lack of such facilities is environmentally hazardous.

The setting of priorities should consider what sectors of the environment are presently, or will in the near future, be affected.

This can be seen as a prophylactic approach in which various elements of the environment such as surface and ground water, air, soil, wetlands and other elements which make up the aquatic and terrestrial ecosystems are listed

and checked off as to whether they are presently undergoing some form of degradation.

Once the affected elements and the level to which they are being degraded has been established priorities as to rectification of the causes can be set.

These environmental priorities will, however, need to be approached within the greater context of community needs where the allocation of funds is concerned.

Community priorities must also be evaluated in terms of their possible long-term negative effect on the environment.

For example, the following chain of events could occur should the use of pit-latrines in the Black township continue:

Water Quality - Ground water which through leaching will affect fresh surface water; this will in turn affect wetlands and thereby the aquatic and terrestrial ecosystems; fish breeding grounds negatively affected leads to lower quantities of fish in the surrounding areas; effect on fish catches and tourism lowering the strength of local economy; less work and unemployment increases; use of river water becomes a health hazard which could over time effect the economic position of the person involved leading to possible social impacts.

It is therefore important to consider "what if" in the

allocation of priorities in that what may seem, in the short-term, to have positive attributes may over a longer period of time prove detrimental.

8.3 FINANCE

A major portion of financing for capital works or improvements carried out by local authorities is obtained from either Provincial Administration grants or income from property taxes or can be obtained from allocations made by the Regional Services Council on a priority basis.

As consideration of the environment has gained momentum in both the private and public sectors it appears that the acquisition of funds could be accomplished through careful motivation of the environmental benefits or improvements which a specific proposal could bring about.

A further possibility is to consider the involvement of private sector developments in projects which would normally be financed by the local authority.

This could be accomplished by allocating certain compatible development rights to municipal property in exchange for the financing of public projects such as the upgrading of the river banks or street upgrading.

Land could be allocated to developers on a "proposal call" basis as discussed in Section 9 in exchange for financial benefit. This system is seen to be superior to the "tender" process presently being used for the allocation of

municipal land and is acceptable to the Department of Land Affairs who administer State land.

8.4 LEGISLATION

Present legislation, particularly the Land Use Planning Ordinance of 1985, (refer Annexure 1 for other related legislation) does not enforce the use of environmental management and screening processes although the existing legislation can be utilised adequately by an authority wishing to ensure environmental compatibility of development proposals.

In including environmental considerations into structure planning, rezonings and documentation concerning the application procedures within an authority's area of jurisdiction a system of screening can be introduced which makes use of existing legislation. (Annexures 1.1 to 1.15)

The authority can further introduce measures such as aesthetic control on the submission of residential and other building plans whilst still using the National Building Regulations as a basis for assessing the structural components of the building. This has successfully been carried out by organisations such as Garden Cities Ltd. in the Cape, St Francis Bay township and has also been applied to application for the construction of houses in the Royal Alfred Marina.

It is foreseen that the relevant government and provincial

authorities would welcome proposals by a local authority to introduce by-laws which would assist in maintaining the environment within that authority's jurisdiction.

8.5 MANAGEMENT OF THE NATURAL ENVIRONMENT

The natural elements which are found within the immediate environs of Port Alfred such as wetlands, streams or rivers, dune areas and the beaches have been identified in the Urban Structure Plan (Figure 7.12) and integrated with proposed green areas such as the pedestrian promenade along the river to form an open-space plan.

The management of natural areas should include policies to ensure the continued existence of indigenous plant life, especially in areas where future development may take place and the denuding of these areas could lead to soil erosion or degradation of the top soil layers.

Catchment areas of the river must be maintained to ensure that the river and associated wetlands remain in a healthy state.

The protection of fauna and avifauna in the succulent riverine thicket surrounding the river, bush areas, dunes, and beaches must be undertaken.

8.6 MANAGEMENT OF THE URBAN ENVIRONMENT

Enhancement of the urban environment of Port Alfred will in the medium to long term be economically advantageous. Once

a town becomes known for its unique character it is almost certainly guaranteed visitors.

In dealing with residential expansion the authorities should attempt to encourage the filling in of vacant residential erven before too much development occurs towards the periphery.

A sliding scale of taxation on vacant erven could be introduced which increases over time thereby discouraging speculation on property values and creating a higher density in areas already fully serviced.

The section which dealt with proposals for the town gives details of specific upgrading programmes which could be undertaken but in general it is proposed that the entire population of the town will benefit from sensitive management of urban development.

Care must be taken to conserve all buildings of historic or cultural significance although it is not always the individual buildings but rather groups of buildings and their precincts which display local character. For example, the buildings along Wharf Street as a whole have the potential to impart a sense of the historic and cultural background of the town.

The old Port Captain's house near the entrance of the river, on the western bank, retains certain historic value as a landmark although it has been modernised with the

addition of an extra floor.

Care should also be exercised in the approval of new building plans for structures which will be in close proximity to existing buildings. It is often desireable to ensure "harmonic integration" by relating new buildings to existing in general form, size of openings, general tone and colour. The creation of "harmonic contrast" can also often be achieved by carefully employing contrasting forms and materials, etc. but in both cases the use of facsimiles of existing structures, particularly those with historic architectural significance, should be avoided at all costs as they have seldom proved to be satisfactory.

The introduction of industries will require careful monitoring of possible pollution hazards. These are shown in Figure 7.4 and are concerned mainly with the drainage of industrial waste products into the water systems and the pollution which could be caused by the emission of pollutants into the atmosphere.

8.7 INTEGRATED ENVIRONMENTAL MANAGEMENT

8.7.1 PRINCIPLES AND DEFINITIONS

It is the total environment (biotic, social, economic and cultural) which the principles of Integrated Environmental Management seek to enhance and protect.

For the purpose of this report the terms given below shall be defined as follows:

An Environmental Assessment (EA) is an investigation made to "map" or define all relevant aspects of the environment which may be affected by a development or developments.

An Environmental Impact Assessment (EIA) evaluates the effects that a proposed development or developments will have on this environment be they either of a negative or positive nature.

Integrated Environmental Management (IEM) is a systematic approach for ensuring the structured inclusion of environmental considerations in decision-making at all stages of the development process.

The object of IEM is not to impede development, but to provide an effective approach, using interactive and iterative techniques, to improve a proposal or suggest more environmentally acceptable ways of meeting the purpose and need of a proposal.

8.7.2 THE IEM PROCESS

An environment can be developed to provide things that will improve human conditions, or it can be conserved to provide these benefits later or to maintain natural amenities and life support systems which directly contribute to human well-being and survival.

Development and conservation are therefore fundamentally directed at the same thing, the problem being to obtain the correct balance between them.

In a report published by the Council for the Environment in 1988 a general procedure for Integrated Environmental Management was proposed. (Figure 8.2)

In this document it is proposed that IEM should be applied to the four stages of the development process as shown below:

8.7.2.1 STAGE 1 - PROPOSAL GENERATION

This stage is concerned with formulating a proposed action and perhaps useable alternatives.

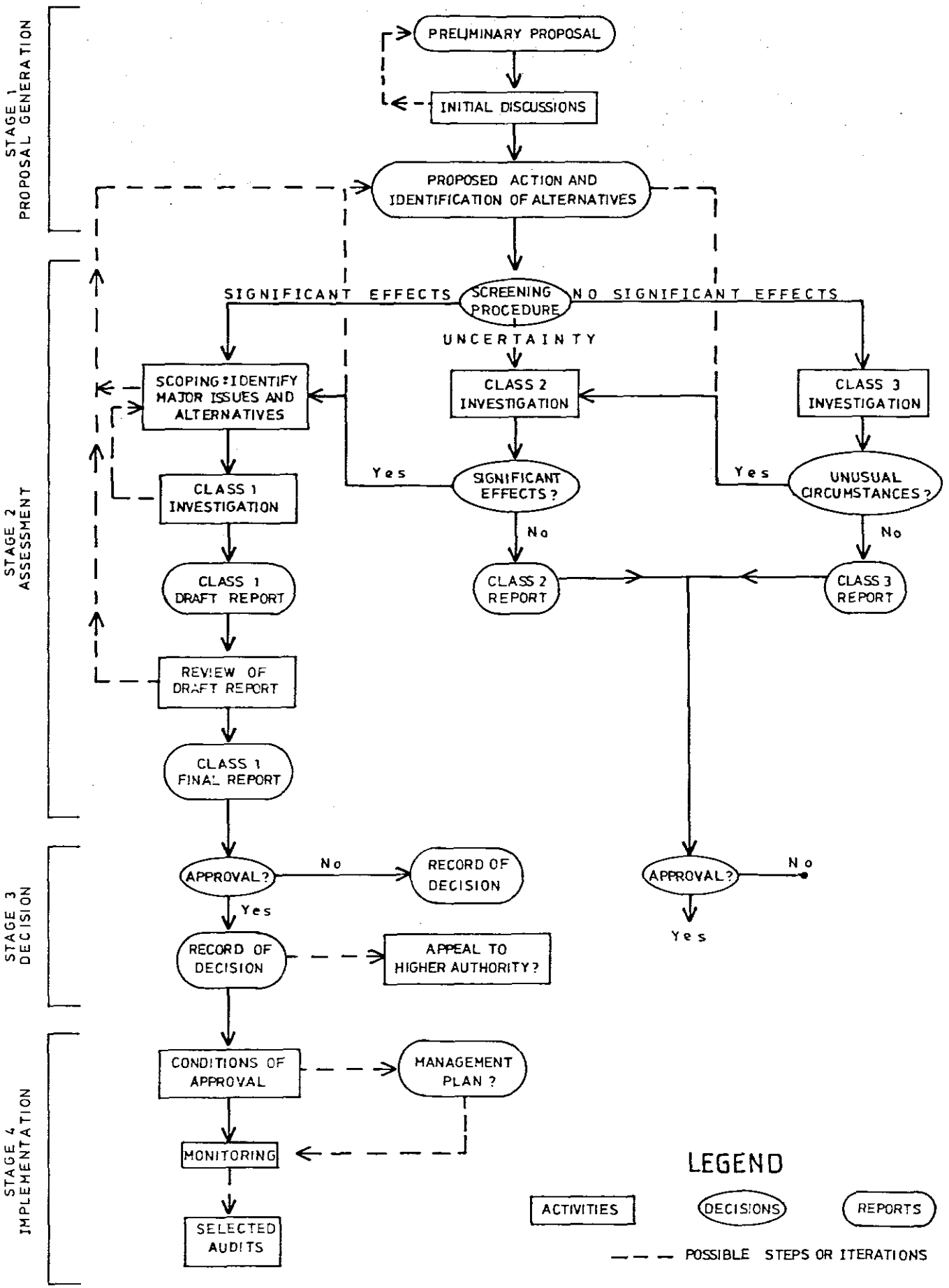
It is proposed that during this stage, unlike in the past where proposals (for major projects or rezonings) that were submitted sometimes had unacceptable environmental implications, environmental analysis is carried out concurrently with the planning and design activities.

It is therefore more probable that the final proposal as submitted to the relevant authority will have a better chance of being environmentally sound.

8.7.2.2 STAGE 2 - ASSESSMENT

Assessment involves investigating and evaluating the proposal which could possibly lead to further alternatives.

In the case of IEM this involves the application of a systematic procedure for evaluating the effects proposals will have on both the socio-economic and bio-physical environments. Traditionally analysed by means of an



Source: IEM in SA, COUNCIL FOR THE ENVIRONMENT, 1988

IEM PROCESS

FIG 8.2

Environmental Impact Assessment (EIS).

The environmental information generated during this stage will, together with other factors, form the basis on which the decision-maker will evaluate the alternatives.

8.7.2.3 STAGE 3 - DECISION

The decisions here are involved with identifying and formally approving the proposal and one or more leading alternatives that the authority believes is in the best overall interests of society, and to produce a document which indicates how the decision was reached and any methodology that may be used to appeal against such a decision.

8.7.2.4 STAGE 4 - IMPLEMENTATION

This stage is concerned with ensuring that a practical procedure is devised to successfully implement and manage the approved proposal in an environmentally-sound manner.

8.7.2.5 CLASS LEVELS

By introducing a screening procedure an authority will be able to determine the kind of assessment that may be necessary to ensure environmental integrity.

The time and money required to complete each type of assessment would probably vary greatly and it is proposed that all such costs are borne by the proponent.

The report proposes three classes of assessment, namely:

(i) CLASS 1 ASSESSMENT

This level of assessment would be applied to proposals deemed by the authority to result in possible significant environmental consequences.

A Class 1 assessment could take some considerable time and money and could be expected to take in excess of one year.

(ii) CLASS 2 ASSESSMENT

This class would apply to proposals for which there is uncertainty as to whether significant environmental consequences may result.

The time involved here would most probably be one or two months and result in a report of some 15 to 20 pages.

(iii) CLASS 3 ASSESSMENT

Class 3 assessment would apply to proposals which are highly unlikely to result in significant environmental consequences.

Time involved here would be very short, the report would only need to substantiate the fact that no significant impact would occur and could be completed in a day or two.

9

I M P L E M E N T A T I O N

9.1 FORMATION OF ASSESSMENT COMMITTEES

The implementation of an environmental management strategy which includes the involvement of the public will require that the local authority appoint committees which have public representation.

The formation of committees is also necessary because of the sometimes confidential nature of initial proposals.

This confidentiality should not stem from the authority but is necessary to protect the ideas put forward by proponents from plagiarism by other organisations.

Total public awareness is therefore not always desireable at all stages but should include input at the very outset as to the type of proposal and again once the field has been narrowed to two or three possibilties.

The constitution of an assessment committee should include responsible employees of the authority, consultants appointed by the authority, members of a ratepayers' association and any other body with a vested interest in the preservation of the area such as the Kowie Trust and its economic development such as a local Chamber of Commerce.

This public constituent of the committee must also be permitted to question the appointment of consultants and suggest alternatives in cases where they feel that the consultant is for some reason unable to assess proposals objectively.

Specific interest groups could also be included on sub-committees dealing with such aspects as wildlife conservation, protection of historical buildings and determination of levels of acceptable aesthetics.

Although the principle of public involvement is advocated the authority must be aware of the pitfalls of this involvement. Certain sectors of the public, although perhaps in the minority, are oftn a position to sway decisions in their favour due to members' access to the press or even perhaps to certain influential persons in the private sector or political leaders.

It is not the object of this report to embark on a lengthy discussion of problems which may arise through public involvement in that both location and the timing of development proposals will influence the type of problem or the groups involved. The office bearers of a local authority are normally well aware of the groups that may become involved in decisions concerning proposals of a controversial nature.

In order to ensure timeous evaluation of proposals, the authority and its consultant must request only the presence

of those members whose expertise or involvement is directly related to the proposal. The authority and consultants must be seen to act with integrity if the public are to accept constitution of the assessment committee.

9.2 ASSESSMENT PROCESS

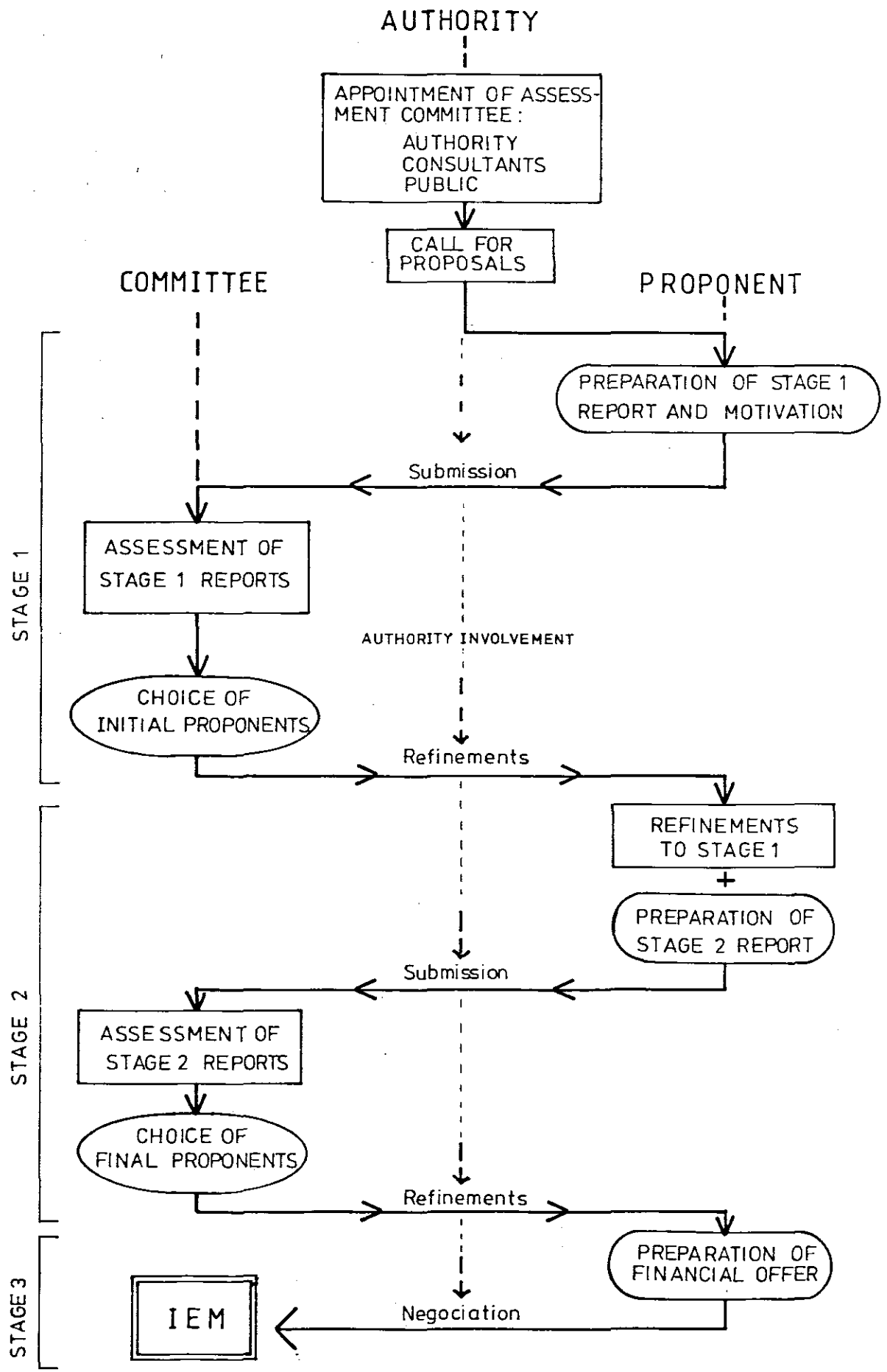
9.2.1 PROPOSAL CALL

In the past, proposals for development of public land were initiated from the private sector based on market studies carried out by themselves and were driven by profit motives.

The Proposal Call system does in no way preclude this approach nor does it totally ignore the process of disposing of state-owned or council land through the tender system with the land being allocated to the highest bidder. (Figure 9.2)

However, a three stage proposal call system is seen to be advantageous in that the local authority and members of the public have more say over what will be acceptable on a specific piece of land. It also accommodates the needs and suggestions of the public in that proposals can be accepted from non-developers who have no financial backing. These proposals are then published to field the response of developers within a predetermined set of guidelines.

The proposal call system can be of the closed or open variety. The open system has no predetermined concepts and



PORT ALFRED

FIG 9.1

gauges the market climate. Proposals are assessed on desireability in the first place before any further negotiations are entered into.

In the closed proposal call the authority owning the land advertises that the land is available for development but spells out a broad concept which it has determined as desireable.

Thereafter the First Stage of the system comes into operation (Figure 9.1) with the interested developers preparing a conceptual plan for the land with a motivation which is submitted on a predetermined date for assessment by the authorities' appointed committee.

The committee selects those proposals which are most suitable for the site in question and inform the proponents of any refinements they deem necessary before the submission of a Stage 2 report.

The Stage 2 report is a detailed development plan which shows all the proposed sub-land uses, size and architectural style of buildings, parking and vehicular movement, pedestrian movement and separation, suggested landscaping and tenant mix. At this stage it is also necessary that the proponent submit a formal letter of intent and proof of his experience in the various facets of the development being proposed as well as undertakings from financiers.

A further selection takes place after these submissions and the remaining proposals are carefully screened to determine their environmental compatibility. This can be seen as Stage 3 of the Proposal Call system. Environmental compatibility is determined through the use of the Integrated Environmental Management system advocated by the Council for the Environment (Figure 8.2) and approval is only granted after completion of this stage.

9.2.2 INVESTIGATION LEVELS

The process for the selection of investigation levels (Figure 8.2) can be entered at two positions as shown in Figure 9.2.

In the case where the Proposal Call system has been initiated it is only necessary to commence the assessment investigation at the point where the expected level of environmental impact is assessed.

In the case of a private developer initiating an application to undertake a specific development the process is entered at the top where initial discussions with the authority take place and the public obtain an opportunity to scrutinise the proposals and submit comment.

An inititial decision is taken by the assessment committee as to what level environmental impact can be expected.

(i) Class 3: A Class 3 investigation is carried out on

proposals which are expected to have no negative environmental impacts to ensure that this is in fact the case. The investigation is on a low level and requires only a short Environmental Impact Statement (EIS). Should certain circumstances be found where a level of uncertainty exists the proposal is rejected from Class 3 and submitted for Class 2 investigation.

(ii) Class 2: The class 2 investigation is one in which areas of uncertainty are investigated more fully. These for example could include industrial developments where a possibility of pollution of air and ground water could take place. The object is to prohibit detrimental environmental change and the study which would be more time-consuming should indicate what areas will be influenced and how, through correct management, the impacts could be neutralised.

(iii) Class 1: Should it be determined that environmental impacts are of a significant nature, the proposal is submitted for a full Environmental Impact Assessment (EIS) in which all the possible environmental spheres are investigated to determine the level of impact.
Recommendations are then made as to refinements in location of certain activities, refinements of the design to ensure improved environmental compatibility. Finally, a series of impact control guidelines are submitted to the proponent so that the design can be fully refined.
Once all the refinements have been completed the proposal

is put forward for final approval.

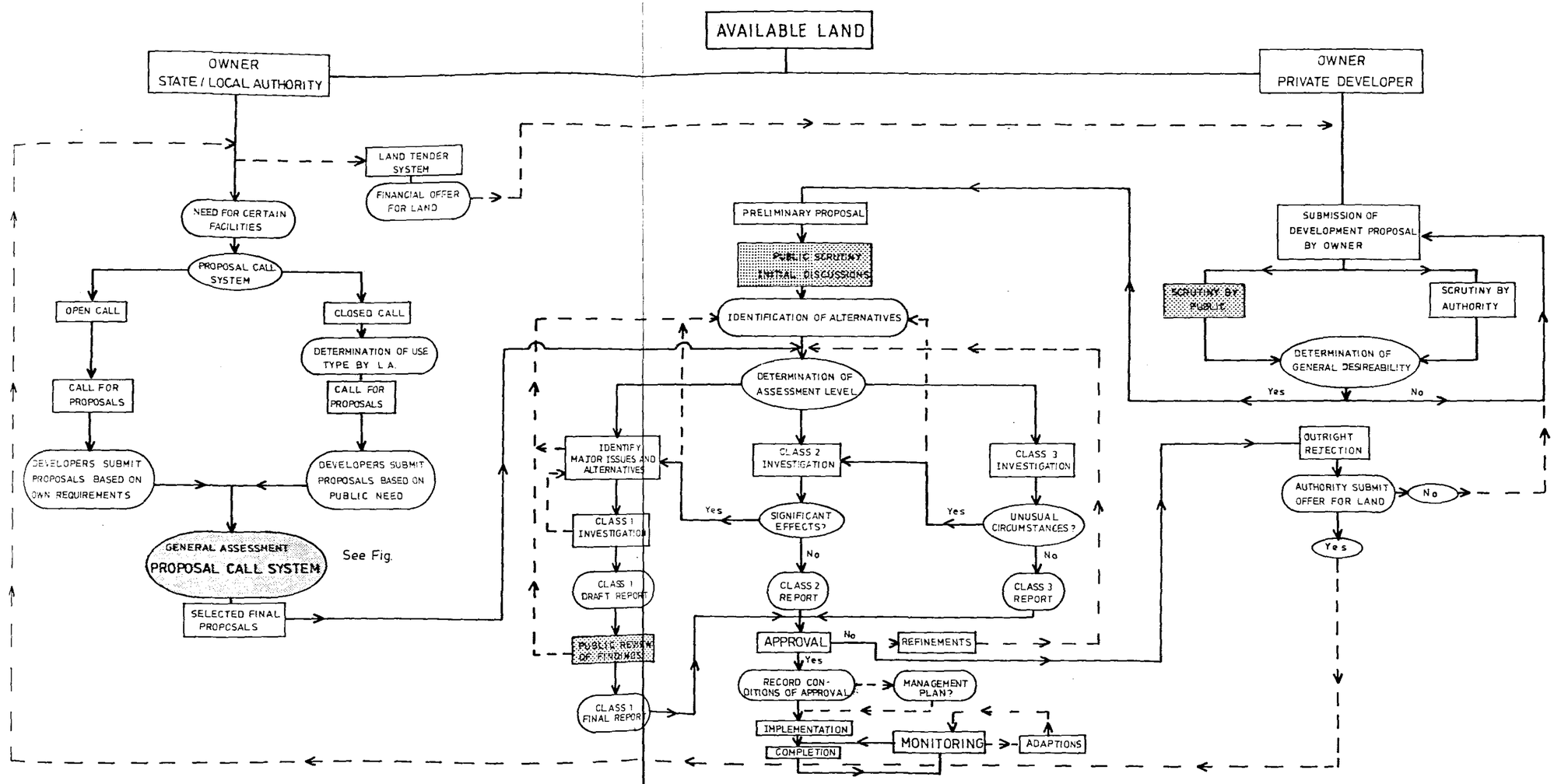
Here again certain options could exist for the private initiative proponent; If all refinements carried out by him do not meet with final approval the authority could offer to purchase the land at municipal valuation and use it for re-entry into the development process via the proposal call system using development parameters determined by public need (Figure 9.2).

The local authority could also consider a land swop if the proposal has sufficient merit but not in the area of the land owned by the proponent. Depending on the municipal valuation a certain amount of financial compensation might be payable by the proponent to the authority for the development rights on council land.

The proponent also has the option to sell the land to another developer at market value or to re-submit a totally different development proposal.

Once approval has been granted a record is made of the conditions of that approval and any other controlling factors and submitted to the proponent before the commencement of construction.

During the entire construction phase a monitoring of environmental change is undertaken. This includes the degradation of the environment, for instance in the clearing of indigenous plant life for a large housing



LEGEND

- ACTIVITIES
- DECISIONS
- REPORTS
- PUBLIC INVOLVEMENT
- PROPOSAL CALL SYSTEM

PORT ALFRED

ASSESSMENT PROCESS

FIG 9.2

development or new road system.

Denuding of the topsoil must constantly be monitored as soil and wind erosion should be prohibited.

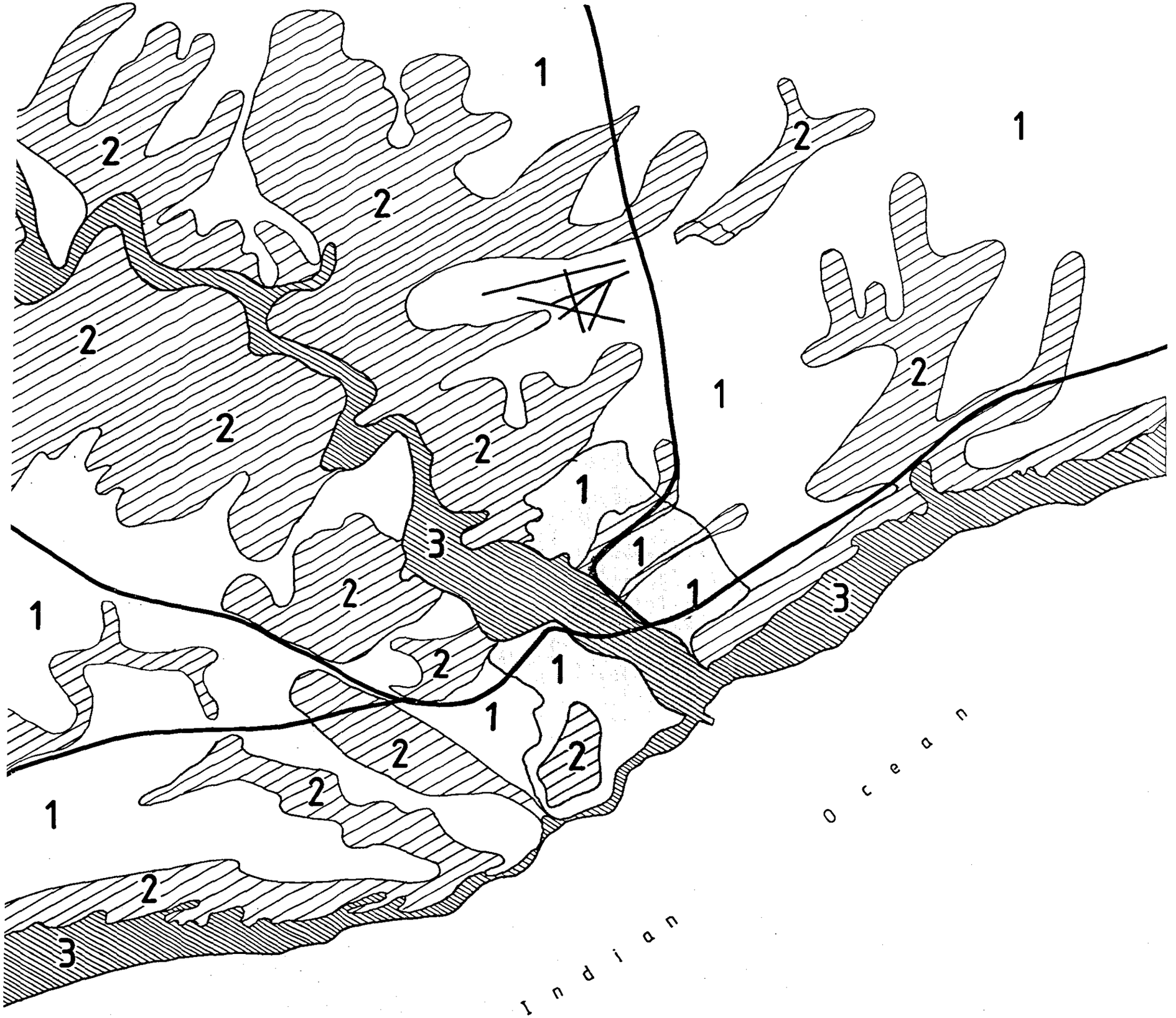
On completion of the project a longer-term monitoring should take place for developments considered under Class 3. Here the monitoring of environmental change is used to make certain adaptions to the development to ensure that slower rate impacts that are detected can be rectified timeously.

The system should also not be seen as one which is only introduced for the assessment of larger projects. It must also be applied at a less rigorous degree for the development of residential dwellings where the determination of setbacks and height restrictions could be influenced as well as the setting of aesthetic standards for new dwellings and additions to existing dwellings.

Environmental changes should also be investigated as part of the rezoning process or where the relaxation of certain conditions or departures from the zoning scheme are sought.

In these cases it is most likely that only an Environmental Impact Statement would be required and a standard single sheet form could be introduced to record this. Only if a significant impact is suspected need such an application be refered for a Class 2 investigation.

Figure 9.3 indicates the areas which from a spatial



LEGEND

LEVEL 1

LEVEL 2

LEVEL 3

URBAN AREA

MAJOR ROADS

PORT ALFRED

DISTRIBUTION OF ASSESSMENT LEVELS

SCALE 1:50 000

FIG 9.3

location point of view have inherent environmental problems as determined in the presentation of the Environmental Structure Plan. The proposal of a large project within the areas shown are likely to require the class of assessment as indicated.

This is only an indication of the level and would be further dependent on the type of development and its extent. For instance a single dwelling in an area indicated as 3 would probably have little consequence in comparison to a housing development, industrial or shopping complex.

Although this process could be seen as time-consuming, and perhaps expensive to the developer who must bear the costs of environmental investigation, it is felt that the system, if well streamlined, could be quicker than at present where much deliberation takes place on environmental issues because of a lack of expertise and policy.

10

C O N C L U S I O N

This study set out to investigate aspects of the town of Port Alfred which would need to be included in the formulation of a Structure Plan. The plan would need to integrate both development in order to sustain and improve the tourist industry whilst simultaneously protecting the environmental character and quality of the town, river, coastline and surrounds.

The report has dealt with an overview of all the different aspects of land use planning which were needed to compile such a Structure Plan for this environmentally sensitive area.

The study has identified and investigated the following aspects:

- the existing activities in terms of land use patterns, demography and socio-economic environments
- physically (abiotic realm) and biologically (biotic realm) sensitive areas
- potential sources of pollution and environmental degradation
- areas of historical significance and areas with unique

development potential in terms of Port Alfred's attraction as a tourist resort

From the analysis of the above a Structure Plan has been prepared which incorporates development guidelines, opportunities and constraints, and delimits the area for future expansion for both residential and industrial land uses.

Proposals have been made for the spatial development of the town and consider the following areas:

- Upgrading of Wharf Street and the Municipal Lagoon to enhance the periphery of the Central Business District and consolidate tourist activities whilst at the same time creating an improved environmental quality

- protection of the primary dunes of East, West and Kelly's Beaches, whilst providing a pedestrian promenade which links the seafront areas with the Central Business District along the banks of the Kowie River

- the East Beach small craft harbour proposal with linking residential development and access.

The Structure Plan has also identified a proposed road hierarchy, industrial site and areas which should be avoided, or developed under strict control, in order to maintain the physical environment and ecology of the Kowie River.

Recommendations have been made for the screening of development proposals from both the public and private sectors based on the principles of Integrated Environmental Management, methods of implementation and public involvement.

The aspects of the environment, both natural and built, addressed in this report can act as a guide to future evaluations concerning the preparation of Structure Plans for coastal towns.

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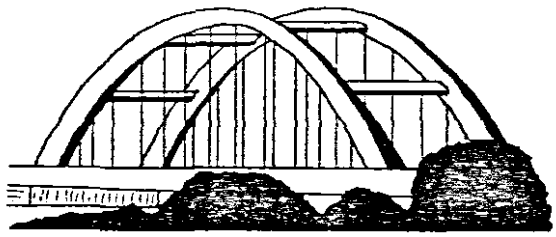

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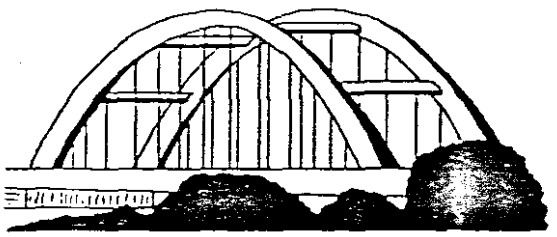
ANNEXURES



A N N E X U R E 1

S U M M A R Y O F E N V I R O N M E N T A L L E G I S L A T I O N

The following is a summary of the various Acts which have been promulgated over the years in an attempt to protect both the natural and built environments. The legislation discussed here has particular reference to land use and land use planning and does not encompass legislation promulgated to limit the use of or protect natural resources or mineral deposits.

As discussed in Section One of this document it is felt that the legislative authorities should consider some form of combining these laws into one all encompassing Act which could become binding on all aspects of the environment.

A 1.1 THE SEA-SHORE ACT, 21 of 1935

The objectives of this Act are to declare the State President to be the owner of the sea-shore and the sea within the territorial waters of the Republic and to provide for the grant of rights in respect of the sea-shore and the sea and matters incidental thereto.
All constructions such as harbours, boat ramps, slipways and marina jetties which traverse the section of shore below the high water mark are subject to this Act.
The Act is administered by the Department of Environment Affairs as far as policy is concerned, but in the Cape Province the executive authority lies with the Chief Directorates of Works and Nature and Environmental Conservation of the Cape Provincial Administration.

A 1.2 ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT, 21 of 1940 (AMENDED up to 1979)

The objectives of the Act are to regulate the display of advertisements outside certain urban areas at places visible from public roads, and the depositing or leaving of disused machinery or refuse and the erection, construction or laying of structures and other things near certain public roads and the access to certain land from such roads. For the purposes of the Act an "urban area" means the area consisting of the erven or lots and public open spaces, other than commonage land, and the streets bounded by erven or lots or such public open spaces in a city, borough,

town, village or township.
The Act is administered by the Department of Transport.

A 1.3 THE WATER ACT, 54 of 1956

The objectives of the Act are to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes - to prohibit the establishment or the extension of townships unless the lay-out plans in question contain certain particulars relating to maximum levels likely to be reached by flood waters within certain periods.
The Act is administered by the Department of Environment Affairs.

A 1.4 ATMOSPHERIC POLLUTION PREVENTION ACT, 45 of 1965

This Act was completely amended by the Atmospheric Pollution Amendment Act, 17 of 1973. (see A 1.8)

A 1.5 THE PHYSICAL PLANNING ACT, 88 of 1967

This Act was originally known as the Physical Planning and Utilisation of Resources Act, 88 of 1967 as mentioned previously in this text. The name was later changed to the Environment Planning Act, 88 of 1967 - with the promulgation of the Environment Planning Act, 104 of 1977 and the later Environment Planning Act, 51 of 1981 the name was changed for the second time to the Physical Planning Act as it stands on the Statuate books today.
The objectives of the Act are to promote co-ordinated physical planning in the Republic; to control the zoning, subdivision and use of land for industrial purposes; to control the establishment and extension of factories on industrial land; to reserve applicable areas for natural resource, and natural area purposes; to provide for the establishment and disestablishment of controlled areas and also the restriction upon the use of land in such controlled areas; to provide for the compilation and approval of guide plans and to provide for the restriction on the use of land for mineral processing and quarrying purposes.
The Act is administered by several central government departments such as the Department of Mineral and Energy Affairs as well as by provincial authorities.

A 1.6 THE NATIONAL MONUMENTS ACT, 28 of 1969

The objective of the Act is to; make provision for the protection of South Africa's national heritage mostly in the form of historic areas or buildings; to provide for the

establishment of a National Monuments Council; and to make provision for this council to acquire fixed property and carry out restoration work on such property; to empower this council to declare areas or buildings National Monuments and to ensure that such National Monuments are retained for future generations; to provide for the funding of such a council.
The Act is administered by the National Monuments Council.

A 1.7 THE MOUNTAIN CATCHMENT AREAS ACT, 63 of 1970

The objective of this Act is to provide for the conservation, application, management and control of land which is situated in mountain catchment areas and to provide for matters incidental thereto.
The Act is administered by the Department of Environment Affairs.

A 1.8 SUBDIVISION OF AGRICULTURAL LAND ACT, 70 of 1970

The objectives of the Act are to control the subdivision of agricultural land; to regulate, in certain circumstances, the sale of agricultural land; to regulate the utilisation thereof for specified purposes, for example to exclude the use of the land for residential development; to prohibit the registration of certain leases over such land; to control the publication of town planning schemes relating to the use of agricultural land and to provide for the registration of servitudes in respect of agricutural land.
For the purpose of this Act the Minister may after consultation with the applicable provincial administration and by notice in the government gazette, declare any land as agricultural land as well as declare any land not to be regarded as agricultural land.
The Act is administered by the Minister of Agriculture.

A 1.9 ATMOSPHERIC POLLUTION PREVENTION AMENDMENT ACT
ACT No 17 of 1973

The objectives of this Act are to regulate the use of certain premises and fuel burning appliances; to regulate the making of regulations and the issueing of orders by Local Authorities; to regulate the appointment of smoke control officers and the payment of their salaries; to make regulations and delegate responsibility for dust control; to combat atmospheric pollution by vehicles; to provide for contributions by the State towards the defrayal of expenses incurred in the connection with the combatting of atmospheric pollution and to prescribe penalties and to provide for matters connected thereto.
The Act is administered by the Department of Public Health.

A 1.10 LAKE AREAS DEVELOPMENT ACT, 39 of 1975

The objectives of the Act are to provide for the establishment of lake areas under the control of a Lake Areas Development Board, and for matters connected thereto. For the purposes of the Act the Minister may declare any land comprising or adjoining a tidal lagoon, a tidal river or any part thereof or any other land comprising of or adjoining a natural lake or river or any part thereof which is within the immediate vicinity of a tidal lagoon or a river, to be a lake area.
The Act provides for the establishment of a Lake Areas Development Board. The general function of the board is to develop State land situated within a lake area or to facilitate the development thereof by a Local Authority or any other body. This development mainly refers to the provision of amenities and accommodation for visitors and tourists to the lake area.
The Act is administered by the Department of Environment Affairs.

A 1.11 THE WATER AMENDMENT ACT, 42 of 1975

This Act is an amendment to the Water Act, 54 of 1956, the major amendment being the requirements of the insertion of 1 in 50 year flood lines on any township lay-out plans if the proposed township is situated close to a public stream.
The Act is administered by the Department of Environment Affairs.

A 1.12 NATIONAL PARKS ACT, 57 of 1976

The objectives of the Act are to provide for the protection of existing National Parks established before the promulgation of this Act; to make provision for the establishment of new National Parks and the acquisition of land for this purpose; to provide for the establishment of a National Parks Board of Trustees and to provide for a Land Acquisition Fund to be administered by them.
The Act also makes provision for the proclaiming of a prohibition on prospecting and mining in certain Parks and for the transfer of certain "Lake Areas" as proclaimed under the Lake Areas Development Act, No 39 of 1975 to the Board.
The Act is administered by the Department of Environment Affairs through the National Parks Board.

A 1.13 SLUMS ACT, 76 of 1979

The objectives of the Act are to provide the mechanisms to rectify cases where slum conditions occur. The extremely bad condition implied by a slum may relate to one

residential building or a specified residential area. It should be noted that a slum condition refers to such undesirable living conditions that health hazards jeopardise the inhabitants thereof or the adjacent residential areas.
The Act sets out procedures for a health officer to submit a report to a Local Authority on an alleged slum situation. This can include overcrowding of dwelling units, the lack of facilities such as sufficient light or ventilation, the lack of water supply or removal of night soil and garbage. In this way the quality of the built environment is maintained.
The Act is administered by the Department of Community Development.

A 1.14 ENVIRONMENTAL CONSERVATION ACT, 100 of 1982

The objectives of this Act are to make provisions for the co-ordination of all actions directed at or liable to have an influence on the environment; the establishment of a council for that purpose; the establishment by that council of committees in order to assist the council in the performance of it's functions; the establishment of management committees in respect of certain nature areas; the appointment of honorary environment conservation officers; the making of certain regulations by the minister; the assignment to local authorities of certain functions in terms of such regulations; the conferring upon the Minister, and the Administrator of a province, of certain powers in respect of certain local authorities and to provide for incidental matters.
The Act is administered by the Council for the Environment and the Department of Environment Affairs as well as the Chief Directorate: Nature and Environmental Conservation of the Cape Provincial Administration in the Cape Province.

A 1.15 ENVIRONMENTAL CONSERVATION ACT, Act No 100 of 1989

This Act supercedes the Environmental Conservation Act of 1982.

The objectives of this Act are to refine and replace the Act of 1982; to state the principles and policy of the government in respect of the environment; to provide for the re-establishment of the Council for the Environment; to provide for the establishment of a Committee for Environmental Management and a Board of Investigation to manage and control Natural Areas, environmental pollution and disturbance, and the detrimental effect of activities on the environment.

The Act also makes provision for certain Regulations regarding the management of waste, noise, Limited

Development Areas and, most importantly, Environmental Impact Assessments.

This section of the Act gives guidelines as to the content and format for EIA's.

The following is quoted from the Government Gazette, No 11013 of 30 October 1987:

"26. The Minister may make regulations with regard to the evaluation of the effect of a proposed activity on the environment, relating to -

(a) the scope and content of environmental impact reports which may include but is not limited to -

(i) a description of the proposed activity and of alternative activities;

(ii) the identification of the physical environment which may be affected by the proposed activity;

(iii) a prediction of the nature and extent of the proposed activity on the land, air, water, biota and other elements or features of the natural or man-made environments;

(iv) the identification of the economic and social interests which may be affected by the proposed activity; and

(v) a prediction of the nature and extent of the effect of the proposed activity on the social and economic interests;

(vi) a description of the design or management principles proposed for the reduction of adverse environmental effects;

(vii) a concise summary of the finding of the environmental impact report;"

The Act is administered by the Department of Environment Affairs, who is responsible for the delegation of executive authority to the Provincial Administrations or other government bodies where necessary.

TRAFFIC COUNT ANALYSIS

DATE: 19-09-84

TIME	1	2	3	4	5	6	7	8	9	10	11	12
0800-1000	48	76	60	5	87	31	23	155	59	46	87	0
1000-1200	56	93	55	8	80	47	34	112	52	72	136	1
1200-1400	100	107	60	8	78	32	20	113	70	72	127	1
1400-1600	56	93	38	1	70	27	26	119	58	37	73	2
1600-1800	56	67	36	4	63	44	27	96	60	69	132	8
TOTAL	316	436	249	26	378	181	130	595	299	296	555	12

TRAFFIC COUNT ANALYSIS

DATE: 20-09-84

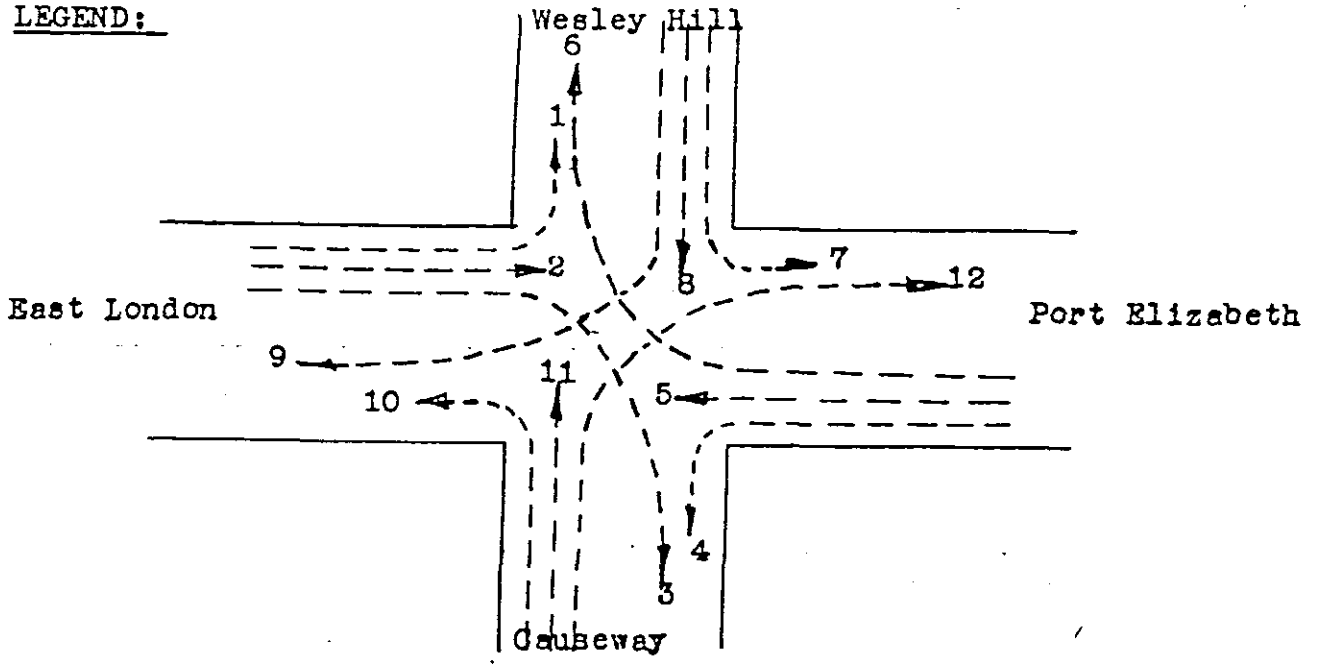
TIME	1	2	3	4	5	6	7	8	9	10	11	12
0800-1000	57	86	63	4	58	25	24	161	52	60	109	9
1000-1200	71	81	53	4	77	38	34	155	74	48	125	8
1200-1400	101	113	65	4	70	32	33	125	65	79	145	9
1400-1600	53	93	43	3	44	45	22	136	70	55	122	7
1600-1800	93	98	51	4	88	42	13	111	67	86	119	1
TOTAL	375	471	275	19	337	182	126	688	328	328	620	34

TRAFFIC COUNT ANALYSIS

DATE: 21-09-84

TIME	1	2	3	4	5	6	7	8	9	10	11	12
0800-1000	53	56	85	4	57	32	33	148	60	55	84	10
1000-1200	79	87	50	11	79	46	18	130	62	74	125	12
1200-1400	114	116	47	1	78	36	24	118	79	65	119	9
1400-1600	56	113	57	5	179	36	29	162	58	71	114	4
1600-1800	79	92	62	4	105	41	27	122	52	92	155	5
TOTAL	381	464	301	25	498	191	131	680	311	357	597	40
AVERAGE	357	457	275	23	404	185	129	654	313	327	591	29

LEGEND:



TRAFFIC COUNT ANALYSIS

DATE: 01-12-87

TIME	1	2	3	4	5	6	7	8	9	10	11	12
0800-0900	264	239	94	119	146	211	190	125				
0900-1000	367	363	135	164	263	261	198	175				
1000-1100	362	340	123	116	269	254	141	177				
1100-1200	331	279	133	133	257	255	154	205				
1200-1300	317	290	109	159	243	205	172	187				
1300-1400	247	203	98	117	212	178	153	210				
1400-1500	292	238	105	127	185	251	155	120				
1500-1600	325	307	130	151	219	238	166	143				
1600-1700	306	270	143	140	214	223	176	206				
1700-1800	275	323	137	124	236	260	232	173				
TOTAL	3086	2852	1207	1350	2244	2336	1737	1721				

TRAFFIC COUNT ANALYSIS

DATE: 29-12-87

TIME	1	2	3	4	5	6	7	8	9	10	11	12
0800-0900	272	304	137	156	217	170	219	214				
0900-1000	386	389	203	283	339	214	312	354				
1000-1100	328	505	261	317	461	204	363	387				
1100-1200	270	486	224	185	409	185	318	364				
1200-1300	505	412	224	310	362	187	307	484				
1300-1400	257	377	170	143	302	168	244	285				
1400-1500	303	434	176	156	315	230	295	269				
1500-1600	214	419	164	131	374	185	292	309				
1600-1700	320	528	242	164	412	188	325	419				
1700-1800	268	483	152	147	360	120	285	315				
TOTAL	3123	4337	1953	1992	3551	1851	2960	3400				

TRAFFIC COUNT ANALYSIS

DATE: 30-12-88

TIME	1	2	3	4	5	6	7	8	9	10	11	12
0800-0900	157	304	134	99	210	150	194	142				
0900-1000	260	493	205	164	344	221	312	242				
1000-1100	327	519	278	202	413	221	337	412				
1100-1200	285	456	222	199	413	158	245	352				
1200-1300	238	443	205	162	383	171	302	352				
1300-1400	211	337	158	121	257	172	249	245				
1400-1500	222	397	166	167	331	191	314	277				
1500-1600	281	471	175	111	334	200	272	279				
1600-1700	288	579	234	210	425	189	351	320				
1700-1800	231	465	180	134	360	129	275	317				
TOTAL	2500	4464	1957	1569	3470	1802	2851	2938				