CHAPTER THREE: DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This section of the report provides an overview of the affected environment as well as a brief description of surrounding land use activities. It includes desktop level information regarding the biophysical, socio-economic and heritage attributes of the site, which aid in the process of identifying project activities that may have potential impacts on the environment and require further investigation. This information also highlights potential constraints which the affected environment may place on the development. The information presented in this chapter is based on a desktop review of available literature, maps, planning frameworks; web based information resources, as well as a site visit to the affected property.

The provisional development proposal entails the development of an additional approximately 300 hectares on the Remainder of Farm 82 Wolve Kop (~908 ha), Portion 1 of Farm 77 Wellshaven (~22ha) and Portion 3 of Farm 77 Honeyvale (~128ha) for agricultural purposes. The expansion of the agricultural infrastructure of the farm will include the clearing of indigenous vegetation, landscaping and levelling the site for citrus orchards, installation of water reticulation and irrigation infrastructure, construction of a balancing dam, the establishment of unpaved access roads and the establishment of windbreaks (Detail in Chapter 2).

3.2 SITE LOCALITY AND OVERVIEW

River Bend Citrus Farm is an existing farming operation with approximately 271 hectares currently under cultivation, with orchards spanning across a number of cadastral units (land parcels). However the study area for the purposes of this assessment is limited to the three portions of land (RE/82; 1/77; 3/77) earmarked for the establishment of the additional orchards. The study site straddles the gravel road between Addo and Enon in the Sundays River Valley Municipality; and can be accessed via a gated entrance located approximately 250 meters from the intersection where the gravel road turns off from the Zuurberg road (R335) (see locality map in Chapter 1).

The affected properties, Remainder of Farm 82 Wolve Kop (~908 ha), Portion 1 of Farm 77 Wellshaven (~22ha) and Portion 3 of Farm 77 Honeyvale (~128ha) have a combined extent of approximately 1058 hectares, with 110 hectares, located in the centre of RE/82 Wolve kop, already under cultivation. The farm has established farming infrastructure such as offices; workshops; storage sheds; and workers rest-areas as well as ablution facilities. The remainder of Farm 82 Wolve Kop is bisected into a west and east portion by the gravel Zuurberg Road (R335). Only the western half forms part of this assessment as the eastern half currently forms part of the Addo Elephant National Park concession area. The study area is also divided into a northern and southern section by the already existing orchards that have been planted on either side of the Coerney River which flows in an east-west direction through the middle of RE/82 Wolve Kop.

The sections of the property that are being assessed in the Scoping and EIA process are covered largely by indigenous vegetation (Sundays Thicket), which is intersected by a variety of cut-lines, animal paths, and internal vehicle tracks; attesting to past agricultural use of the property. In addition, the undeveloped portion of land in the southern section of RE/82 Wolve Kop includes a number of labourers' dwellings within a fenced compound.

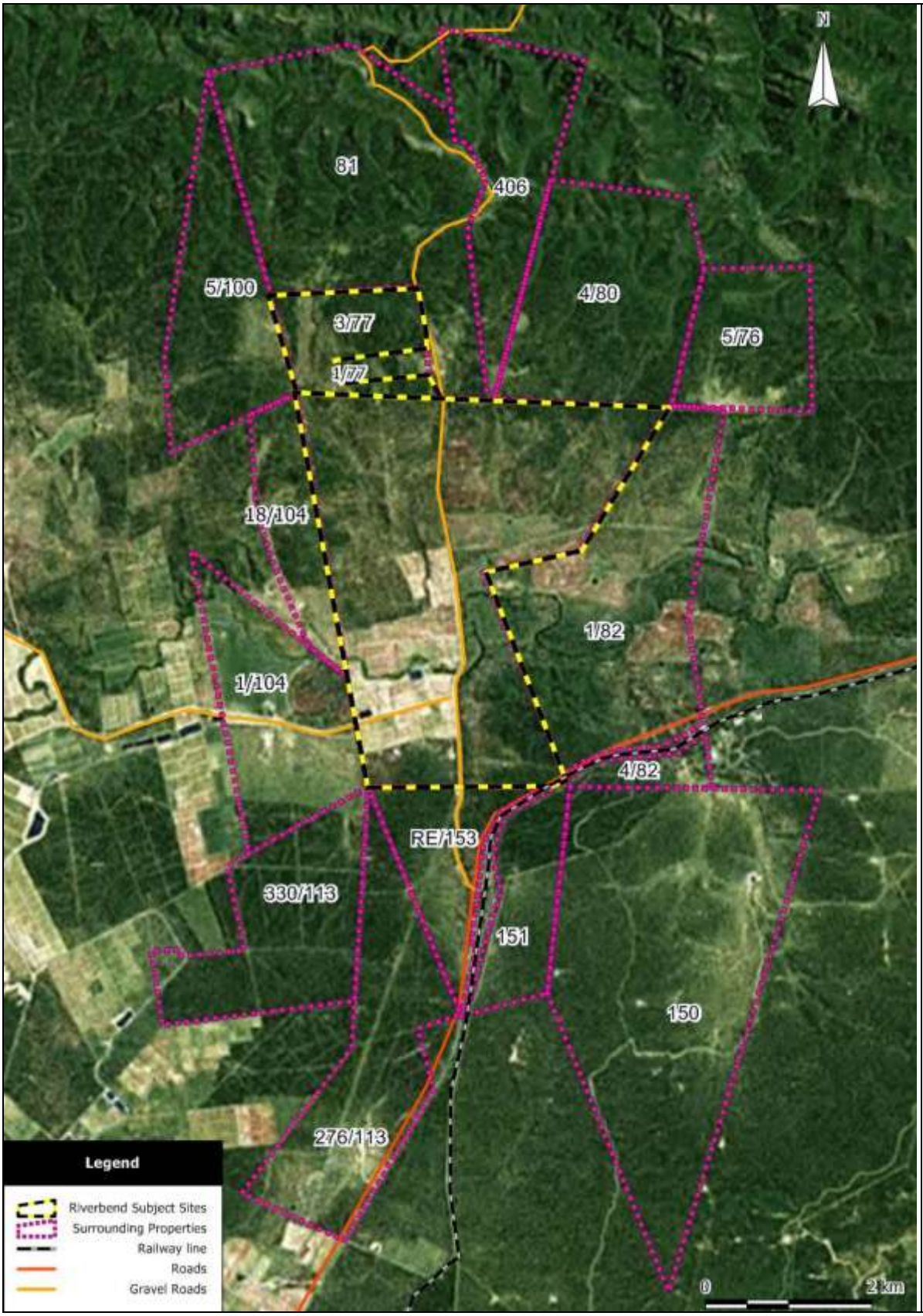
	
Photo 3.1 A view across the site from the north, along a cutline through the thicket.	*Photo 3.2. Labourers' dwellings in the southern portion of the site.*

3.3 SURROUNDING LAND USES

The existing orchards on the affected properties (110ha) are actively used for citrus production. The undeveloped portions of the site are currently being used for game farming (RE/82), and stock farming (1/77 & 3/77). The land-uses on the properties surrounding the study site include game and stock farming, cultivated lands, and orchards. While conservation and tourism activities associated with the Addo Elephant National Park take place on land to the east and south east of the site. Activities on the land surrounding the study site identified to date include:

- *Portion 5 of Farm 100* Game and/or Stock Farming
- *Portion 18 of Farm 104* Game and/or Stock Farming
- *Portion 1 of Farm 104* Citrus
- *Portion 330 of Farm 113* Citrus
- *Portion 276 of Farm 113* Game and/or Stock Farming
- *Remainder of 153* Game and/or Stock Farming
- *Farm 151* Tourism (AENP)
- *Farm 150* Tourism (AENP)
- *Portion 4 of Farm 82* Tourism (AENP)
- *Portion 1 of Farm 82* Tourism (AENP)
- *Portion 5 of 76* Game and/or Stock Farming
- *Portion 4 of Farm 80* Game Farming and Tourism
- *Farm 406* Game and/or Stock Farming
- *Farm 81* Game and/or Stock Farming

Map 3.1 on the following page provides an overview of properties adjacent to the study area.



Map. 3.1 Proposed site (Remainder of Farm 82 and Portion 1 and 3 of 77) and surrounding properties (Portion No. / Farm No.).

3.4 BIOPHYSICAL ENVIRONMENT

3.4.1 CLIMATE

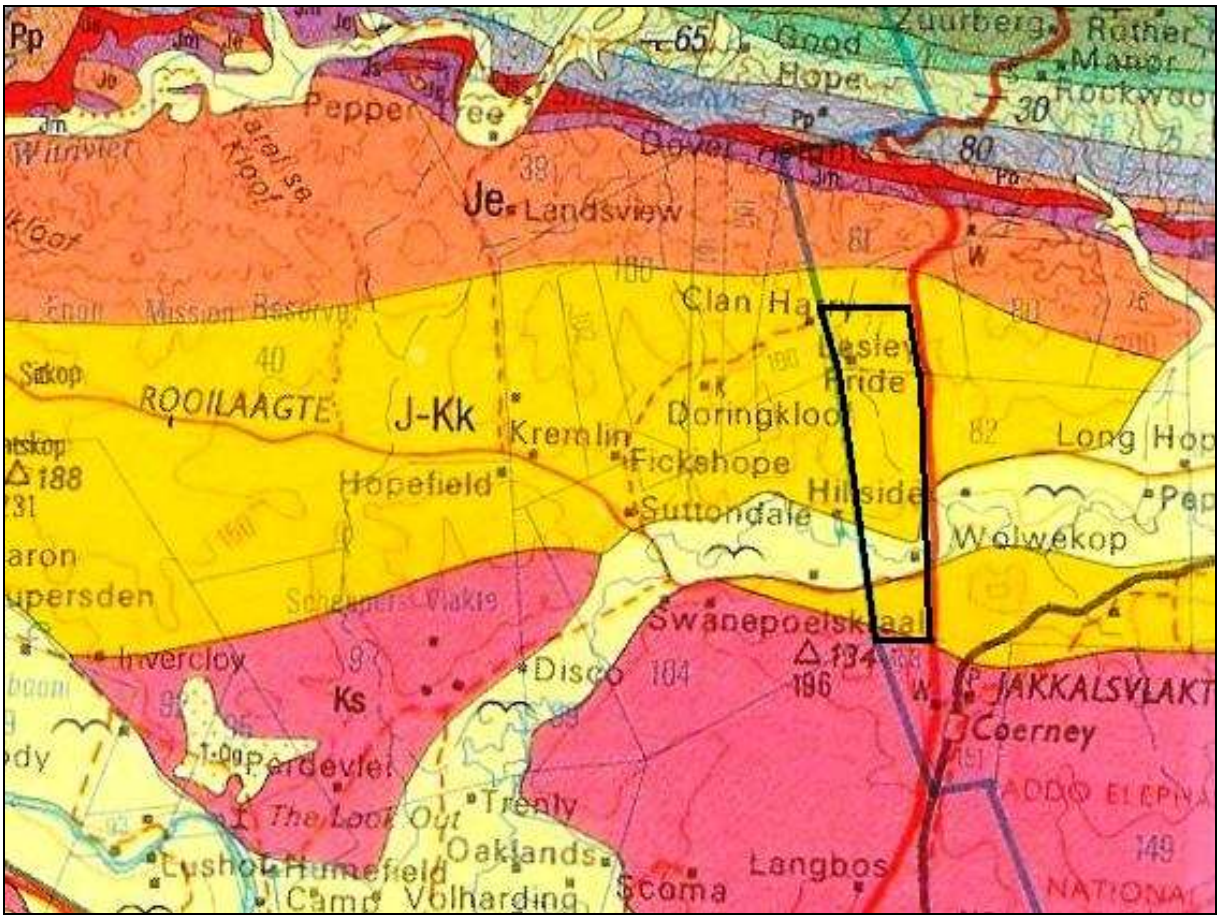
The study area generally has a hot and dry climate, however winters can be cold. Average summer maximum and minimum temperatures are approximately 32 and 15°C; with temperature maxima of 18 and 5°C in winter. However minimum temperatures as low as -2°C have been recorded in winter months, while summer temperatures have been known to exceed 45°C.

The area has a low rainfall and receives an average rainfall of about 500 mm per year, with rainfall peaks in March and October. Agriculture in the area relies heavily on canal water brought into the area via an inter-basin water transfer scheme by the Sundays River Water Users Association.

3.4.2 LANDSCAPE AND GEOLOGY

Geology

According to the geological map (Sheet 1:250 000, Geological Series - 3324 Port Elizabeth) for the area the site is underlain by mudstone and sandstones of the Kirkwood Formation (Shown as J-Kk on geological maps). The central portion of the site is shown to be covered by alluvium deposits associated with the Coerney River and its flood plain (shown as cream quaternary deposits on the geological maps).

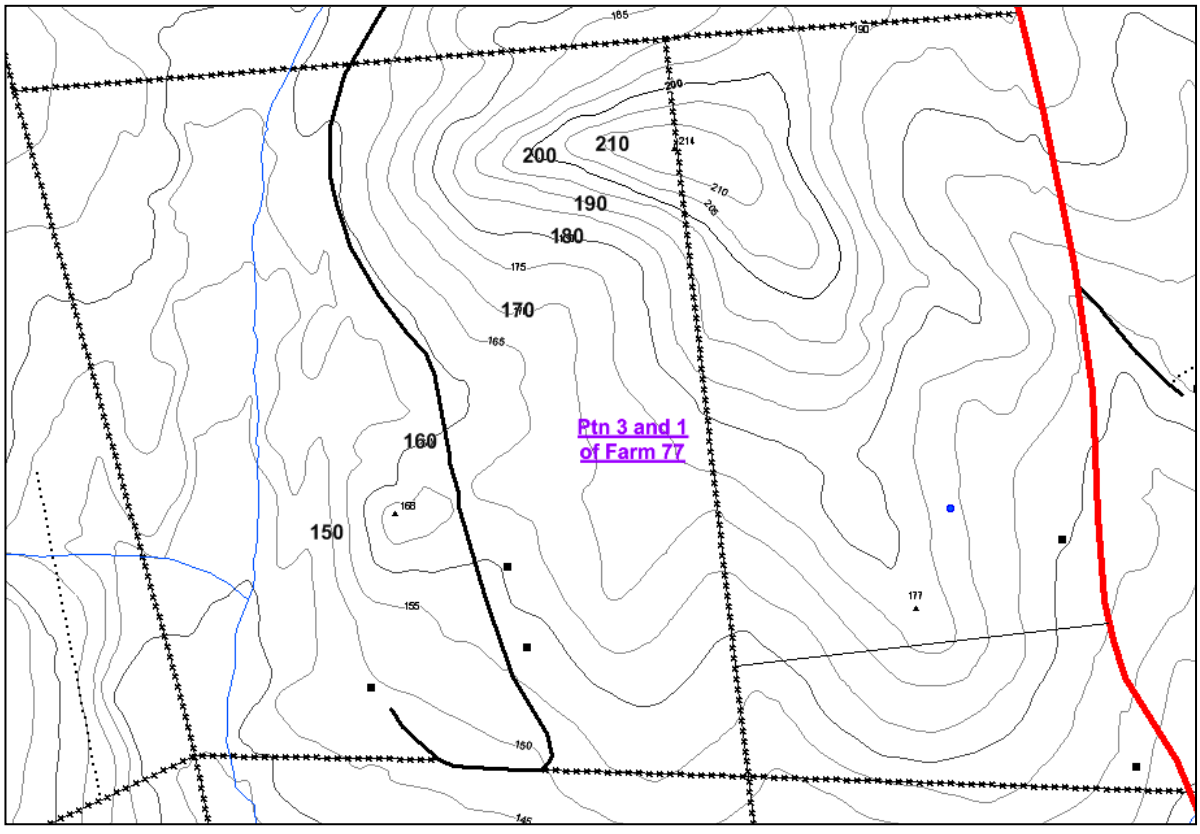


Map 3.2 Geology of the study area: J-Kk (Yellow) - Kirkwood Formation - Reddish and greyish mudstone and sandstone; Cream – Recent Alluvial Deposits (Study site outlined in black).

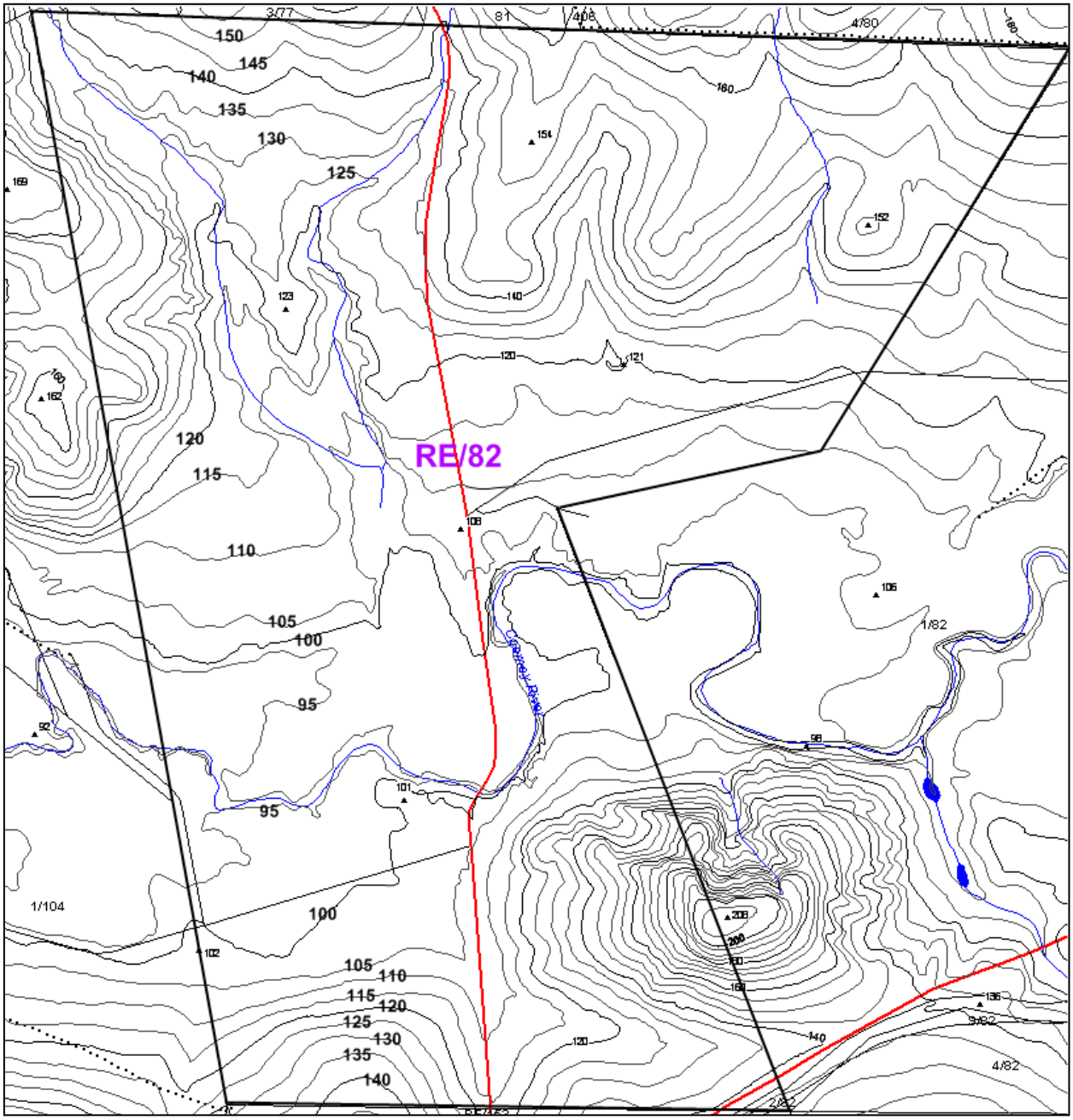
The Kirkwood Formation is thought to have originated in a fluvial depositional environment during the Cretaceous period. The formation includes silty mudstones and sandstones. Some fossil finds have been made in these rocks, including plant, reptile and invertebrate fossils. Therefore, the proposed agricultural expansion on the site could potentially have an impact on fossil deposits. The quaternary alluvium is unlikely to contain fossils and is mostly restricted to the portion of the site that has already been cultivated. A paleontological specialist will determine the likelihood of the occurrence of substantial fossil deposits at the site as well as the potential impacts of the proposed development on such deposits through a desktop Palaeontological study.

Topography

The topography of the landscape within the study area (Remainder of Farm 82 and Ptn 1 and 3 of Farm 77) ranges from gently sloping hillside to steeply sloped valley sides. The elevation of the area ranges from approximately 210 metres in the north eastern corner of the study area (Ptn 3 of Farm 77) to less than 100 metres at the river in the central section of RE/82 Wolve Kop (existing orchards). It then slopes up again to approximately 140 metres in the southern section. The section of RE/82 Wolve Kop that is under assessment (west of the R335) slopes inwards towards two drainage lines that run the length of the study area and eventuate in the Coerney River.



Map 3.3 Contour map showing topography of portions 1 and 3 of farm 77.



Map 3.4 Contour map showing topography of the remainder of farm 82.

3.4.3 GEOHYDROLOGY AND SURFACE WATER

Due to the sloped nature of the site, the area is expected to have good drainage, which will follow the topography as described above, draining towards the south.

Drainage

The site falls within the N40D quaternary catchment, which forms part of the Sundays River system, into which it ultimately eventuates. Surface runoff from the site will be dictated by the topography of the site. Runoff from the northern portion of the site is expected to drain southwards, towards the Coerney River, which represents the lowest lying portion of the site. Surface runoff from the southern-most portion of the site, being located south of the Coerney, would drain northwards to reach the river. However runoff from this portion of the site is likely to

be intercepted by the orchards and the stormwater infrastructure associated with the gravel road before it reaches the river.

Rivers

The main drainage features on the site are two broad valleys that run the length of the site, and drain the northern portion of the study area. These are broad low lying grassed swales, rather than typical watercourses with well-defined channel and riparian areas. While these drainage features are not characterised by a continuum of hydrophytic vegetation; accumulations of surface water at certain points within these remain for long enough for wetland conditions to establish. In view of the above; these valleys may represent watercourses as defined in terms of the National Water Act, 1998 (Act 39 of 1998). As indicated above, these eventuate into the Coerney River in the southern portion of the site. The Coerney River flows in an East-West direction, and traverses the entire River Bend Citrus farming operation.

Photo 3.3. Broad grassed swale, which represents the drainage line in the eastern valley in the study area.

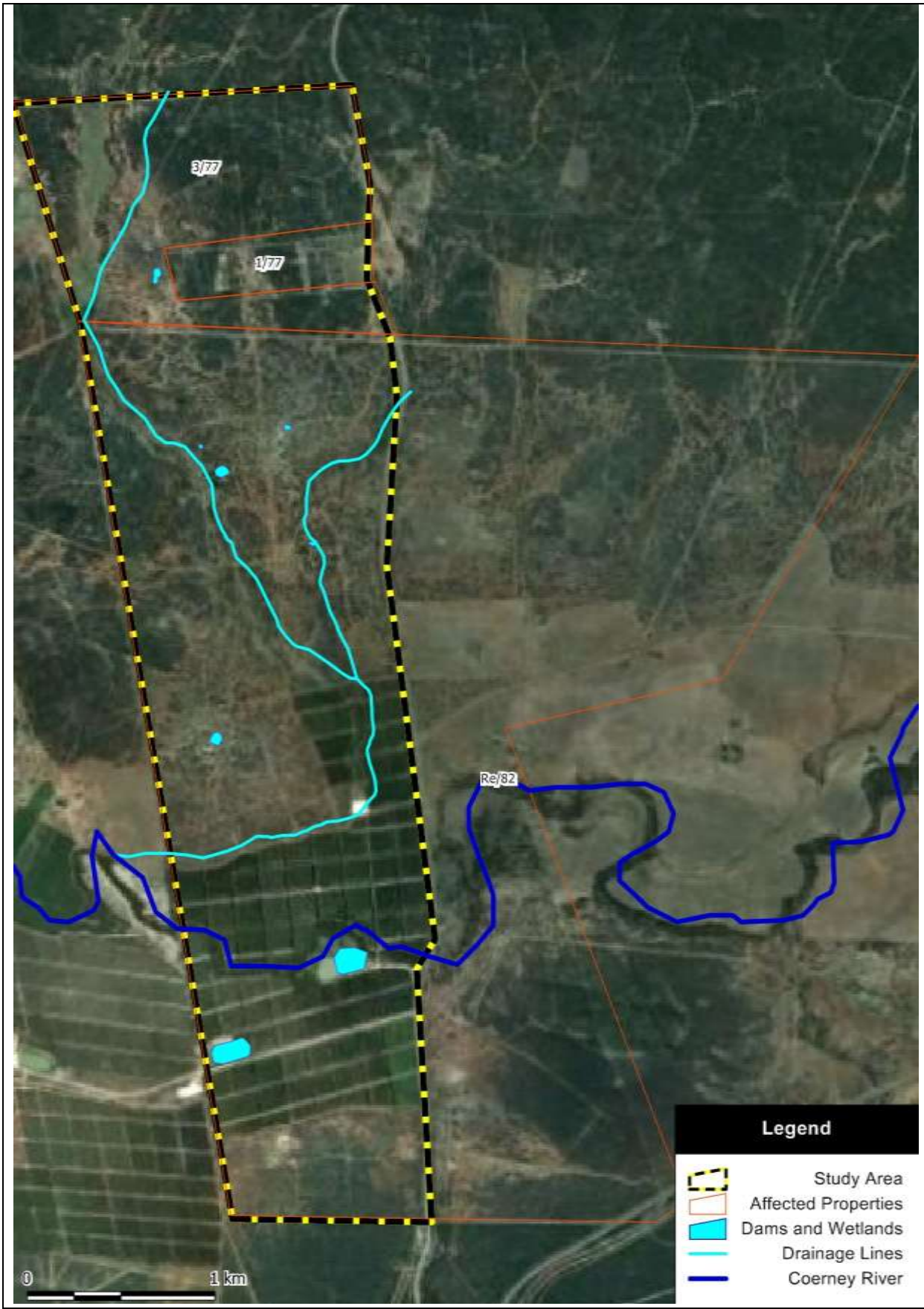
Photo 3.4. Ponding of runoff in a depression along the eastern drainage line leads to the establishment of hydrophytic vegetation.

Dams and Wetlands

The site visit revealed that there are a number of dams and potential wetland areas, particularly in the northern portion of the site. These are predominantly areas where runoff has been artificially impeded by the creation of man-made berms or dam walls. It is not known whether these dammed features were originally natural ephemeral pans prior to human intervention. At least 5 such dams / pans were noted at the site. Notwithstanding their origins, these features contain standing water, and associated hydrophytic vegetation, e.g. sedges / rushes, as well as aquatic fauna such as frogs and terrapins. The conservation value, as well as the requirements of the National Water Act as it pertains to activities near such features will need to be considered by the wetland specialist in the EIA phase of the assessment.

	
Photo 3.5. Dam / pan associated with the western drainage line.	*Photo 3.6. Sedges and hydrophytic grasses in a pan in the central portion of the site.*

The map on the following page indicates some of the wetlands and drainage features noted at the site during the scoping phase site visit. The presence, distribution and extent of the drainage features and potential wetlands on site; as well as their ecosystem functioning and ecological state should be confirmed by a wetland specialist during the EIA phase of the process. No development is currently proposed within the rivers or wetlands on the property, however, these areas should be appropriately mapped and suitable buffers established. No abstraction of water from rivers or dams on the property is proposed.



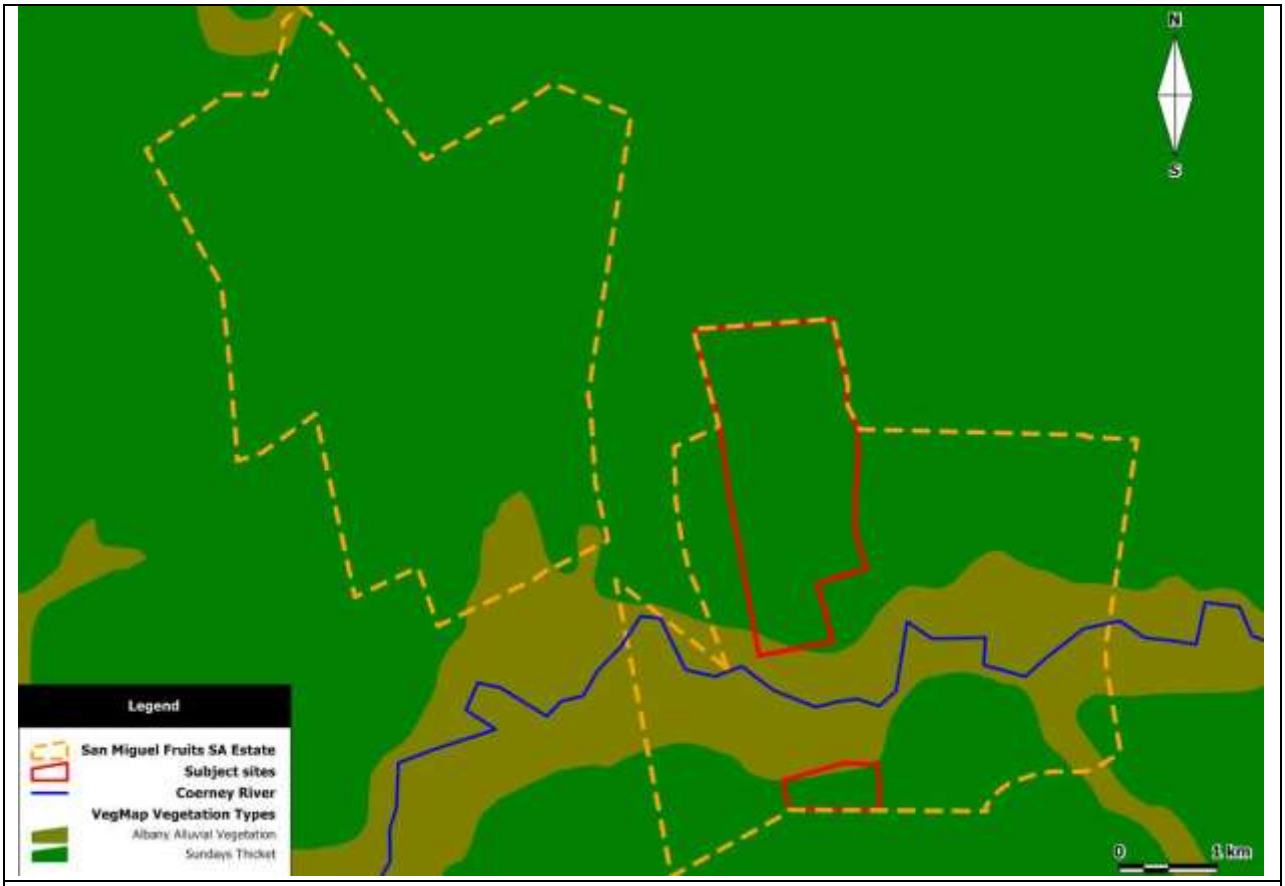
Map 3.5 Dams/wetlands and watercourse/drainage lines noted at the site during initial investigations.

3.5 VEGETATION

The vegetation expected to occur at the site is noted in a number of conservation planning framework documents relevant to the general area. The resolution of the planning framework mapping is limited to a landscape level, and the vegetation types and distribution on individual farms is subject to confirmation by a botanical specialist. The section below outlines the findings of the relevant conservation planning frameworks.

3.5.1 NATIONAL CONTEXT

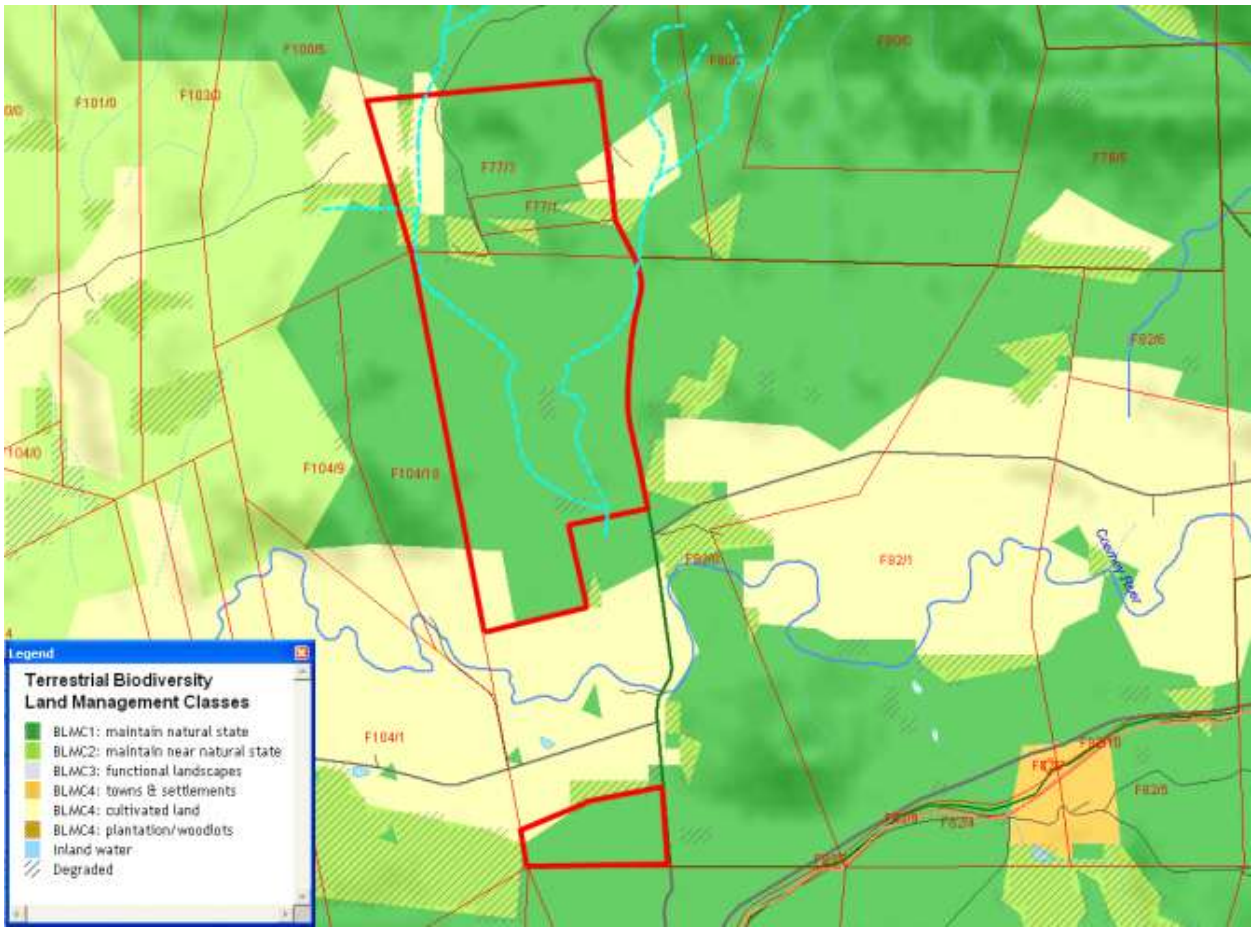
The **NSBA** (National Spatial Biodiversity Assessment) and the Vegetation Map of South Africa, Lesotho and Swaziland (VEGMAP, Mucina and Rutherford, 2006) maps show the vegetation on the subject sites as Sundays Thicket and Albany Alluvial Vegetation (Map 3.6). Both of these vegetation types are considered Poorly Protected, but the former has an Ecosystem Status of Least Concern, while the latter is considered to be Endangered. The site visit has revealed that the portion of the site which was presumed to be covered by Albany Alluvial Vegetation has been historically transformed for agriculture (orchards).



Map 3.6. Vegetation on the proposed properties as mapped in VegMap showing the two vegetation types present on site.

3.5.2 REGIONAL CONTEXT

The **ECBCP** (Eastern Cape Biodiversity Conservation Plan) maps indicate that most of the affected portions of the site are classed as “CBA1” (dark green on map 3.7), with a few patches being “CBA2” (light green) or “cultivated land” (yellow).



Map 3.7. ECBCP Mapping for the affected area. (Dark Green - CBA1, Light Green - CBA2, Yellow – Cultivated Land).

STEP (Subtropical Thicket Ecosystem Programme) (Pierce & Mader 2006.) - According to the STEP mapping resources the southern section of the site is covered by *Sundays Spekboom Thicket*, which is considered Vulnerable, while the northern portion is covered by *Sundays Thicket (no spekboom)* which is considered currently not vulnerable. The portion in the middle of the site (on either side of the Coerney River) has been mapped as Sundays Doringveld which is considered to be Vulnerable, however, this portion of the site has already been transformed for agriculture (orchards) (Map 3.8). The STEP Transformation map depicts this as well as a few patches of transformation towards the northern extent of the proposed site.

Map 3.8. Vegetation on the proposed properties as mapped in STEP showing the three vegetation types present on site.

3.5.3 VEGETATION ON SITE

The initial site visit and overview of the vegetation at the site seemed to confirm the presence of the Thicket vegetation types described above at the site. The vegetation encountered in the northern portion of the site seems to resemble Sundays Thicket. Indicator species such as *Cussonia spicata* (Kiepersol) and *Euphorbia triangularis* (Tree Euphorbia) were present, if not dominant, especially at higher elevations and Spekboom (*Portulacaria afra*) was conspicuous by its absence in the wetter areas of the northern portion. However, exceptionally tall (>5m) stands thereof were present at relatively high densities at higher elevations. In addition, *Schotia afra* var. *afra* (boerboon) was dominant at all elevations. Much of the vegetation at lower elevation is fragmented and degraded, with high invasion by *Opuntia* sp. (Prickly Pear) and a number of cut-lines and vehicle tracks.

The Thicket vegetation in the southern portion of the site (south of the Coerney River) however is somewhat different to that found in the north. This difference could exist for one of two reasons. It is possible that the vegetation type in this portion of the site represents remnants of Albany Alluvial Vegetation due to the extensive cover of *Acacia karoo* (sweet thorn) and *Lycium* sp. (Wolwedoring) as well as the presence of a variety of succulents. In addition, the vegetation pattern of Albany Alluvial Vegetation (thicket clumps in a Nama-Karoo matrix) is also vaguely discernable. However, it is also possible that the vegetation on this portion of the site has been disturbed. This possibility is supported by the fact that *Acacia karoo*, which is dominant in this portion of the site, is also an indicator of bush encroachment. In addition, the farm labourer's houses are situated in this portion of the site which may mean that firewood collection and

livestock grazing may be taking place in this vegetation, thus affecting vegetation pattern and species diversity. The vegetation types and distribution on the site should be confirmed by a botanical specialist during the EIA phase of the assessment.

3.5.3.1 Transformed vegetation / cultivated lands

A portion of the site (approximately 110ha) on RE/82 Wolve Kop has been transformed into orchards. The orchards straddle the Coerney River and are currently producing citrus as part of the River Bend Citrus Farming Operation.

Photo 3.7 Orchards straddling the Coerney River.

Photo 3.8 Thicket vegetation in the northern portion of the subject site.

3.5.3.2 Wetland Habitat

Vegetation associated with the wetlands and dams on the site are characteristic of wetland habitat including a number of sedge species. Vegetation in the drainage lines appears to be consistent with that associated high moisture environments.

Photo 3.9 Typical wetland habitat associated with the wetlands in the northern portion of the site.

3.5.4. CRITICAL ECOLOGICAL PROCESS AND BIODIVERSITY AREAS

STEP mapping indicates that the entire study area forms part of a larger STEP corridor. STEP Corridors are the parts of the landscape that are best able to allow the continuation of large-scale ecological processes (especially the movement of plants and animals) if such areas are restricted to low-impact activities. They are long, wide strips of land that follow the coastline and

some of the major river valleys, and they are connected to each other. They vary in width, from a few kilometres up to about 70 km wide in places.

As was noted above much of the site has been classed as a CBA 1 or 2 (Critical Biodiversity Areas) in terms of the ECBCP. Critical Biodiversity Areas are features in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning.

3.5.5 CONCLUDING REMARKS

The findings and recommendations of the conservation planning frameworks for the area should be confirmed by a biodiversity / vegetation specialist in the EIA phase of the assessment. If necessary, suitable recommendations should be made for the incorporation of the requirements of the conservation planning frameworks in the development. A wetland specialist assessment should be undertaken to identify and assess wetlands and watercourses on the study site.

3.6 FAUNA

The northern portion of the subject sites currently form part of the Intsomi Game Farm which is owned by San Miguel Fruits South Africa. As such, the sites would form part of the habitat of the fauna in the Game Farm. The dense thicket vegetation is thus likely to have resident populations of a diverse range of thicket fauna. The site visit revealed that the sites are frequented by Giraffe and a few buck species. In addition, a number of bird species were noted in the vicinity of the site. The Addo Flightless Dung Beetle (*Circellium bacchus*) which is endemic to the region was also spotted in the northern portion of the site during the site visit. A few terrapins (freshwater tortoises) were found in one of the wetlands. The wetland habitat is likely to provide a refuge for these and other animals that may occur at the site.

The portion of the site that is under cultivation, as well as the southern portion is not expected to contribute meaningfully as faunal habitat. Thus faunal numbers on these portions of the site are generally expected to be low.

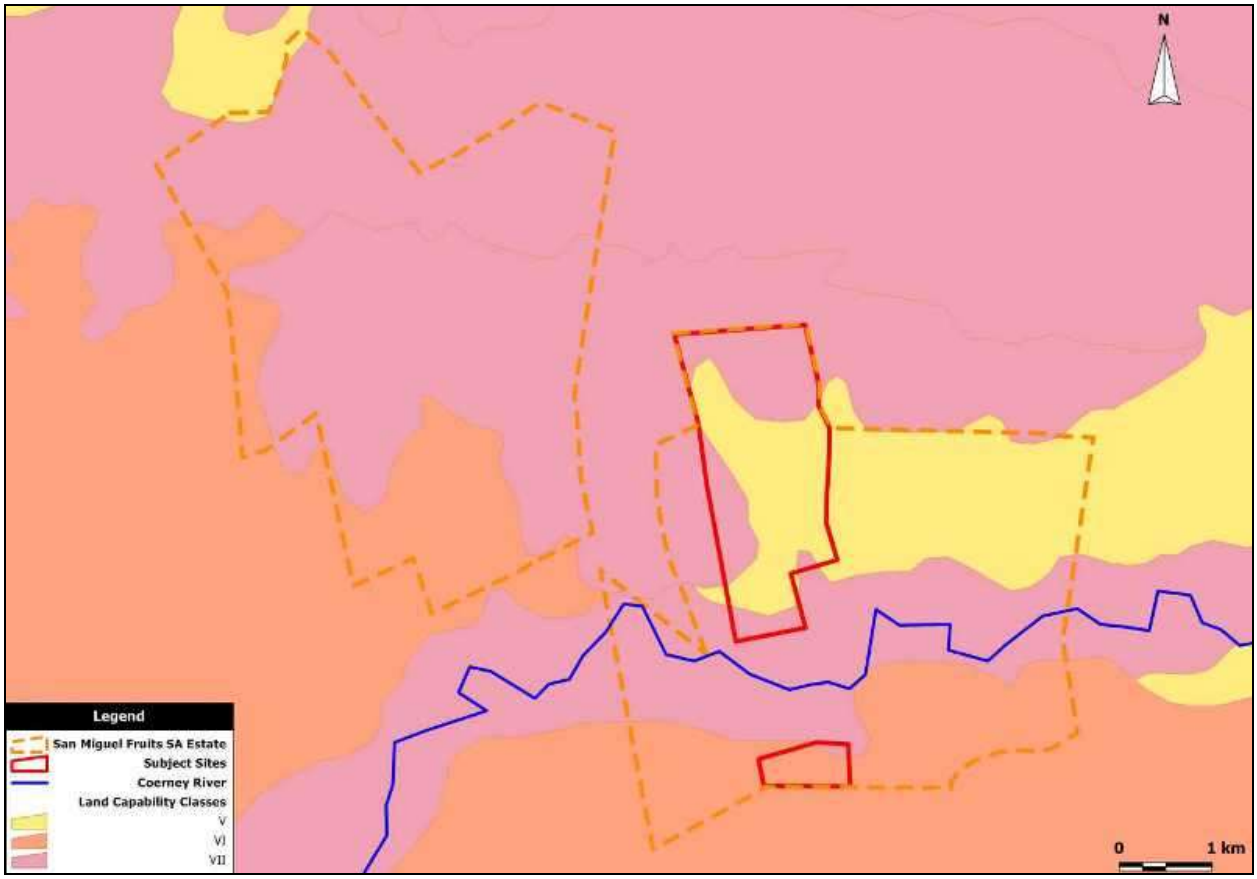
The Ecological Specialist Assessment that will form part of the EIA phase of the assessment should consider the potential occurrence of Rare and Endangered fauna on the site; within the context of the type and extent of faunal habitat on the site.

3.7 AGRICULTURAL POTENTIAL

The AGIS mapping resources were used to obtain information on the Land Capability of the site. The area proposed for development falls into Land Capability Class V, VI and VII. (AGIS, 2007. Agricultural Geo-Referenced Information System, accessed from www.agis.agric.za February 2012). Land Capability classification takes into consideration the terrain, soil conditions and climate in the area.

The majority of the subject sites have been classed as Class V. Land in this class has little or no erosion hazard, but has other limitations that are impractical to remove which limit its use largely to pasture, range, woodland, or wildlife food and cover. The small southern portion of the site is classed as Class VI. This class has sever limitations that make it generally unsuited to cultivation and largely limits its use to pasture, range, woodland, or wildlife food and cover. The last class identified for the site is Class VII, which is restricted mostly to the higher elevations in

the northern portion of the site and the floodplain of the Coerney River. Land in class VII has very severe limitations that make it unsuited to cultivation which restricts its use largely to grazing, woodland or wildlife.



Map 3.9. Agricultural Land Capability (AGIS, 2007, www.agis.agric.za).

This classification of the site does not concur with the current successful citrus production in the central portion of the site (class VII). This may be due to intervention by the farmer, such as irrigation from the SRWU water supply system, and fertiliser application, which may make the area more suitable for cultivation. The EIA phase of the assessment will include the findings of a detailed soil analysis for the site.

3.8 HERITAGE RESOURCES

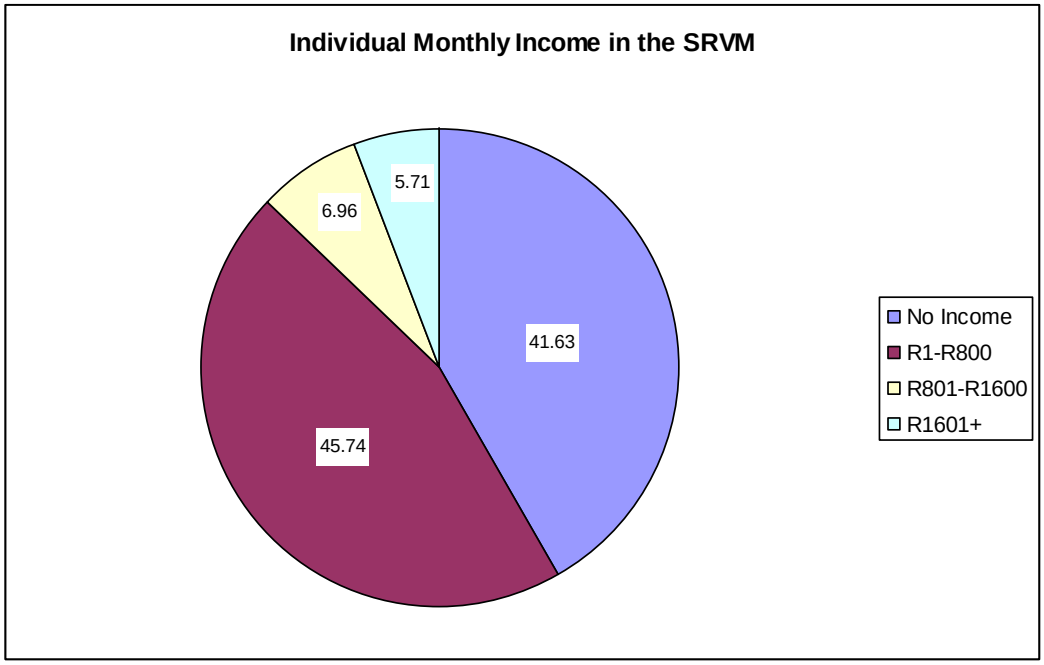
Certain cultural and heritage resources are protected under the National Heritage Resources Act, No 25 of 1999. These may include structures older than 60 years; archaeological and palaeontological sites and materials, and meteorites; certain burial grounds and graves; declared heritage objects; and declared heritage sites.

No graves, burial site, or structures older than 60 years were noted at the site during the site visit. However the site should be surveyed for the presence of graves or burial grounds and potential impacts on these addressed in the EIA phase of the assessment. It is recommended that a desktop Palaeontology assessment; and a phase 1 Archaeological Impact Assessment is undertaken for the site.

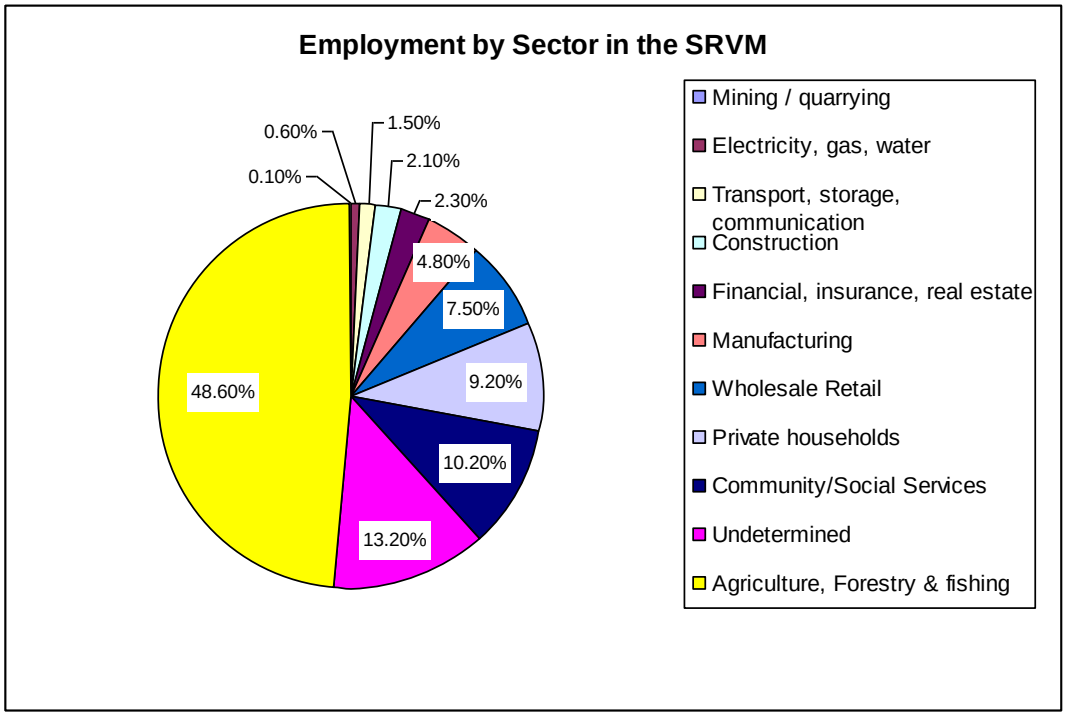
3.9 SOCIO- ECONOMIC

The study site is located in Ward 8 of the Sundays River Valley Local Municipality, which is 1192km^2 in size. The Ward includes, among others, the Enon and Bersheba Settlements which are located approximately 15 kilometres west of the proposed site. No socio-economic data is available for ward 8 as it has only recently been delimited (May 2011). The information included here is descriptive of the entire Sundays River Valley Municipal area.

The Draft IDP (2011) for the Sundays River Valley Municipality indicates that the current unemployment rate in the municipal area may be as high as 44.1%. The monthly income of economically active individuals (age 15-65, employed or unemployed) living within the SRVM, depicted in the graph below, is generally low, with the greater majority earning less than R800 a month.



Agriculture remains a primary focus for employment opportunities as it currently represents almost 50% of the employment for the SRVM area. The agricultural industry centres mainly on citrus fruit farming in the Sunday's River Valley and dairy and chicory farming towards the Alexandria area in the east. Approximately 25% of South Africa's navel oranges and 50% of the country's lemons are produced in the Sunday's River Valley with the Sunday's River exporting more than 13 million cartons of navels per year, earning more than R1 billion in foreign exchange for the country (Draft SRVM IDP, 2011).



The nearby Enon / Bersheba communities as well as the communities associated with Addo (ie. Nomathamsanqa, Valencia) represent an important labour force in close proximity to the proposed agricultural development. It is anticipated that the increased agricultural area will result in a number of new permanent and seasonal employment opportunities for the local community. No specialist socio-economic assessment is proposed for the EIA phase of the Impact Assessment process.

3.10 CONCLUSION AND RECOMMENDATIONS

Key issues identified thus far and which require specialist assessment in the EIA phase of the assessment, are:

- Biophysical site assessment to include:
  - Identification and verification of Critical Biodiversity Areas on the site
  - Potential project related impacts on natural vegetation and faunal habitat need to be considered
  - The consideration of any potential impacts on the Addo Elephant National Park.
- A specialist wetland assessment must be undertaken in order to identify and delineate wetlands and watercourses on the site as well as provide appropriate no development buffers.
- It is recommended that a desktop Palaeontological assessment and a phase 1 Archaeological Impact Assessment is undertaken.
- Soil suitability assessment should be conducted to determine the suitability of the soil for citrus cultivation before the layout is finalised.