

## CHAPTER FOURTEEN: CONCLUSIONS AND RECOMMENDATIONS

### 14.1 INTRODUCTION

As per section 3. (1) I of Appendix 3 of the NEMA EIA Regulations, 2014 (as amended) this section of the report provides an environmental impact statement which contains a summary of the key findings of the environmental impact assessment including:

- *“a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives”*
- *“recording of proposed impact management outcomes for the development for inclusion in conditions of authorization”*
- *“any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorization”*
- *“a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorization”*

This section presents the conclusion on the most significant impacts identified through the EIA process, together with management actions required to avoid or mitigate the negative impacts; or to enhance the positive benefits.

The assessment of impacts is presented in the following sections:

- Ecology – potential impacts on vegetation, biodiversity patterns and processes, as well as fauna (Chapter Six)
- Aquatic – potential impacts on aquatic resources within the development footprint (Farm 653 and pipeline corridor), as well as within a 500m radius (Chapter Seven)
- Traffic – potential impacts on condition and operation of the roads in the vicinity, as well as suitability of access points (Chapter Eight)
- Heritage – potential impacts on heritage resources (Chapter Ten)
- Visual – determine the intensity of potential visual impacts on sensitive viewers (Chapter Twelve)
- Assessment of Alternatives (Chapter Five)

The monitoring of impacts is outlined in the Draft Environmental Management Programme (EMPr) included as Part B of this report. The key issues identified during the Scoping process, which have been the subject of separate specialist assessments during the EIA, are outlined below:

- Biophysical (Biological and Physical) site assessment including:
  - Potential project related impacts on natural vegetation and faunal habitat on the site, as well as along the proposed irrigation pipeline route, need to be considered;
  - The consideration of any potential impacts on the Addo Elephant National Park;
  - An Aquatic Assessment to identify and map wetlands and watercourses on Farm 653, as well as along the proposed irrigation pipeline route;
  - Assign suitable buffers for aquatic resources identified on site and along the proposed irrigation pipeline route;
  - Provide comment on the potential impact of the proposed development on Aquatic CBAs as identified in the ECBCP; and
  - The determination of suitable buffers associated with meeting biodiversity conservation targets specific to the vegetation types on site, and in line with those targets indicated by the relevant planning frameworks for the area
- The undertaking of a Heritage Impact Assessment to identify heritage resources, materials and artefacts that occur within the area under assessment and recommendations regarding the conservation thereof.

- The undertaking of a Traffic Impact Assessment to determine the impact of the additional trip generation and the suitability of the access points to ensure safe access and egress from the site.
- The undertaking of a Soil Suitability Assessment in the form of a Reconnaissance Soil Survey, to determine the suitability of the soil for the establishment of citrus orchards, to inform the proposed layout.
- The undertaking of a Visual Impact Assessment to determine any changes in the “sense of place” and visual landscape as a result of the proposed development.
- The undertaking of a Security Risk Assessment to evaluate the potential elevated security risk posed by the proposed development on rhino and exotic game in the area.
- The undertaking of a Roads and Wet Services Report to determine the capacity of existing services on site (water, effluent, stormwater management) and to provide recommendations if upgrades to the existing facilities are required.

## 14.2 IMPACTS ON ECOLOGY AND RECOMMENDED MITIGATORY MEASURES

The anticipated clearing of vegetation (~650ha) for the proposed agricultural expansion (Chapter Two) on Farm 653 will result in the clearing of Sundays Spekboom Thicket (majority) and Koedoeskloof Karroid Thicket, as well as some already modified vegetation. The loss of vegetation and subsequent faunal habitat will be greatest where intact vegetation is present.

Access tracks traverse Farm 653 which has led to severe modification of land cover in these areas across all the vegetation units. Edge effects also result due to the permanent removal of natural vegetation along these routes. In addition, wildlife and livestock grazing, and browsing has also resulted in some degradation of portions of the farm, particularly in the Bontveld and Koedoeskloof Karroid Thicket. Degradation has further been caused, especially in the woody Thicket areas as a result of the invasion by *Opuntia ficus-indica* and *Opuntia aurantiaca* which is prevalent throughout the farm.

The Sundays Spekboom Thicket has been severely modified on portions of the farm immediately north and south of the MR00470 due to intensive cultivation approximately six years ago (Pers. Comm. Mr Keith Gafney, previous landowner), as well as in other smaller areas on the farm. However, the majority of the Thicket is in a relatively good ecological state based on species diversity, intactness and impenetrability, despite the degradation outlined above. Thus, these areas are classed as moderately degraded.

As noted above, the Bontveld unit appears to have been degraded due to wildlife and livestock grazing resulting in the relatively low species diversity, limited Fynbos and Grassland species, lack of rare or threatened species, and the relative abundance of *Pentzia incana*, *Felicia filifolia* and *F. muricata*; including patches of *Cynodon dactylon*.

To the north of the non-perennial river bed and associated wetland habitat (Refer Aquatic Report, Chapter Seven), south of the MR00470, the Koedoeskloof Karroid Thicket has also been severely modified due to past intensive cultivation. This has resulted in a degraded grassland habitat that is currently being encroached upon by *Vachellia karroo*, and other woody thicket shrubs.

Notwithstanding the above, vegetation in the less dense areas does provide important faunal habitat, as dense thicket tends to exclude many faunal species. A fauna and flora search and rescue operation must be conducted before and during vegetation clearing activities. Relevant permits will also be required before search and rescue can commence.

### 14.2.1 Impacts and Management of Ecology

The key ecological impacts associated with the construction and operational phase of the development are as follows:

- Loss of vegetation due to clearing (biodiversity loss).
- Loss of Critical Biodiversity Area and Ecological Support Area due to clearing of vegetation on Farm 653, as well as along the proposed pipeline route (biodiversity loss).
- Loss of floral and faunal species of conservation/ special concern due to vegetation clearing and poaching (biodiversity loss).
- Fragmentation and destruction of habitat on Farm 653 due to clearing (biodiversity loss).
- Loss of CBA and ESA buffer areas along the non-perennial watercourse, due to clearing of vegetation for agricultural purposes (biodiversity and hydrological process loss).
- Loss and disturbance of wetland habitat and riparian systems along the drainage areas on Farm 653 and the Sundays River (pipeline installation), due to vegetation clearing (hydrological processes and biodiversity loss).
- Potential water quality degradation (chemical and sewage pollution) of the Sundays River, during installation of the pipelines as well as changes to local water quality of the wetland habitats and non-perennial watercourse on Farm 653 due to return agricultural run-off (hydrological processes and biodiversity loss).
- Hydrological process impacts of the proposed pipeline across the Sundays River (hydrological processes – flow, volume, aquatic species).
- Potential loss of riparian system along the drainage area and the non-perennial watercourse due to vegetation clearance for the proposed pipelines and access roads as well as potential loss and modification of wetland habitat due to the expansion of the existing irrigation dam (hydrological processes and biodiversity loss).
- Potential sedimentation and erosional impacts on drainage areas and the non-perennial watercourse and associated wetland habitats, as well as potential erosion and sedimentation impacts on wetland habitat along the proposed pipeline route (hydrological processes and biodiversity loss/ modification).
- Potential increased water levels/ saturation in the wetland habitats and non-perennial watercourse due to drip irrigation (hydrological processes and biodiversity modification).
- Potential changes to the local water quality of the wetland habitats and the non-perennial watercourse due to return agricultural run-off high in nutrients or insecticides, herbicides / pesticides etc. as well as use of existing septic tanks (hydrological processes and biodiversity loss).

Potential Cumulative Impacts on the N40E catchment as a result of the proposed development include:

- Potential cumulative loss of vegetation due to clearing of vegetation (biodiversity loss).
- Potential cumulative loss of Critical Biodiversity Area and Ecological Support Area due to clearing of vegetation (biodiversity and hydrological process loss).
- Potential cumulative loss species of special concern due to clearing of vegetation (biodiversity loss).
- Cumulative loss of CBA and ESA buffers due to clearing of vegetation in the larger catchments (biodiversity and hydrological process loss)
- Cumulative loss and modification of wetland habitat in the larger catchments
- Cumulative impacts on hydrological process of watercourse and riparian areas in the N40E catchments (flow, water quality, erosion, sedimentation etc.).

All these impacts can be reduced by implementing the mitigation and management recommendations found in Chapters Six and Seven.

### **Vegetation, Biodiversity Patterns and Processes**

The following recommendations are made with regards to the mitigation and management of impacts on vegetation:

- The biodiversity target areas indicated in Chapter Six should be retained (as per the proposed layout). The final layout proposes to retain additional areas over and above the biodiversity target no-go areas.
- No Bontveld vegetation is proposed to be cleared.
- Remove only the required amount of vegetation for citrus cultivation activities i.e. minimize the extent of bare and exposed soils.
- If windbreaks are to be planted, plant indigenous windbreaks, if possible.
- Rehabilitation of disturbed areas post establishment with indigenous species.
- Plant species of special concern must be transplanted from the disturbance footprint to refuge areas on the site (e.g. remaining intact areas) by suitably qualified individuals.
- Permit applications to the Department of Economic Development, Environmental Affairs and Tourism for the protected species.
- An alien plant control program should be implemented which ensures that all invasive exotic plants (*Opuntia ficus-indica* and *O. aurantiaca*) must be removed from the site and alien plant control must take place on an ongoing basis.
- The Environmental Control Officer to approve development footprints (based on the no-go areas), prior to clearing and to monitor clearing within demarcated areas.

### **Fauna**

It is anticipated that the vegetation on the site, as identified by the vegetation specialist, would provide habitat to several small to medium mammal, reptilian and amphibian species. The site is likely also frequented by a variety of avifaunal species.

Approximately 85.5 hectares (7.4%) of the natural vegetation on site has been modified historically. Thus, most of the vegetation on the farm can be described as near-natural or degraded. At the time of the site visit buck, bush pig, zebra, porcupine and domestic livestock were determined to have occurred on the farm. The tenant has since vacated the farm and relocated his game and livestock to the new farm. However, some indigenous, wild faunal species are still anticipated to inhabit the natural areas on the farm. In addition, the wetland habitat associated with the non-perennial watercourse is also expected to provide significant faunal habitat.

It is anticipated that most of the faunal species remaining on the farm will in all likelihood move off to undisturbed portions of the site as soon as site preparation commences.

The following provides recommendations for the management of impacts on fauna:

- The mobile fauna which may be occurring on the site are expected to vacate the area that is to be developed once vegetation clearing and other site preparation activities commence and will seek refuge in intact natural or near-natural areas that are not proposed for development.
- Measures must be implemented to ensure that fauna on site are not harmed during site preparation or operational phase activities associated with the development, e.g. environmental induction process for construction personnel and/ or farm workers.
- Before site preparation and vegetation clearing commences, affected areas must be thoroughly searched for fauna that can be relocated. This is to be undertaken by a professional faunal specialist (with the necessary permits) and released into no-go areas or other suitable refuge areas.
- A professional reptile remover needs to be contacted to remove dangerous reptiles when in conflict with the workers.

- Search and rescue operations before and during the site preparation phase will decrease the impacts considerably.
- By retaining the Bontveld vegetation it is anticipated that the proposed development will have little to no impact on threatened faunal species usually associated with this habitat.
- No fauna encountered on site to be intentionally harmed.

### ***Aquatic Features (artificial and natural)***

The field survey concluded that 12 wetland habitats, six ephemeral drainage areas (surface water run-off areas) and one un-named, non-perennial watercourse or river were recorded on Farm 653. The remaining dams/ wetland habitat within 500m of the farm boundary were not surveyed but digitized based on Aerial and Google Earth imagery.

### Wetlands

During the field survey, conducted on the 7 February 2017, two irrigation dams with wetland habitat, were recorded within 32m of the proposed pipeline route and pump station (along the MR00470). A third irrigation dam that also supports wetland habitat was recorded along the vehicle access track, within 32m from of the proposed pipeline route, north of the R336. Additionally, wetland habitat was recorded along the Sundays River at the proposed pipeline crossing.

Only the wetlands on Farm 653 and where the proposed pipeline route is in close proximity to wetland habitat were assessed. Wetland types were grouped together as follows:

- Depression wetland no. 1.
- The unchannelled valley-bottom depression wetlands (2, 3) due to small size and location on an undefined surface water run off area, which means typical stream flow does not occur.
- The unchannelled valley-bottom depression wetlands (4, 5, 6, 7, 8) on Farm 653, which are located on the non-perennial watercourse – with PES Moderately Modified. However, wetland no. 7 and 8 were grouped separately from the other wetlands in this group due to their much larger size for assessing hydro-functional importance.
- All the unchannelled valley-bottom depression wetlands (9, 10, 13) on Farm 653, which are located on drainage areas/ watercourses – with PES Largely Modified.
- The floodplain wetland along the Sundays River.
- Two artificial wetland depressions (irrigation dams) adjacent to the proposed pipeline route/ pump house and the MR00470 and the irrigation dam (artificial wetland no. 11) on Farm 653.

Table 14.1 below indicates the Ecological Importance, Ecological Sensitivity and Hydro-functional Importance of the wetlands as outlined above.

*Table 14.1: Ecological Importance, Ecological Sensitivity and Hydro-functional Importance of the wetlands.*

<b>Wetland No.</b>	<b>Ecological Importance</b>	<b>Ecological Sensitivity</b>	<b>Hydro-functional Importance</b>
1	Low	Low	Low
2, 3,	Low	Moderate	Low
4, 5, 6, 12	Low	Moderate	Low
7, 8	Low	Moderate	Moderate
9, 10, 13	Low	Moderate	Low
21 (Sundays River floodplain)	Moderate	Moderate High	Moderate
11 (Artificial wetland - irrigation dam) & 22, 23 (Artificial wetland depressions (irrigation dams) along pipeline route	Low	Very Low	Very Low

### Sundays River

The Sundays River is a major river in the municipality. The latest Present Ecological State desktop study indicates that the Sundays River (reach N40E-8682) is in a Moderately Modified state (Class C), with a Moderate scoring for ecological importance and ecological sensitivity. Riparian-wetland vegetation was assessed as being in a Moderately Modified state, whereas potential flow and physico-chemical modification were assessed as being in a Large and Seriously modified state, respectively (DWS, 2014).

### Un-named Non-perennial Watercourse

The un-named, non-perennial watercourse is a major river according to the NFEPA and 1:500 000 topographical data; and is a tributary of the Sundays River.

The watercourse did not present with defined channel banks or a typical riparian area; with marginal and non-marginal zones. It is thus considered to be ephemeral in character. It has been transformed in various portions along its length (e.g. north of the MR00470) by past intensive cultivation and has been modified by the establishment of dam berms. Wastewater was being discharged from a sausage casing facility on the farm<sup>1</sup>, which has resulted in a large wetland area along the watercourse (south of the MR00740). Only a few wetland species, with very limited coverage, were recorded in the wetland discharge area, namely *Schoenoplectus decipiens* and the salt marsh plant, *Sarcocornia tegetaria*. The MR00470 has also impacted on and transformed portions of the river watercourse, especially where it aligns parallel to the road along the western boundary of the farm.

The PES of the un-named, non-perennial watercourse is assessed as Largely Modified (Class D).

### Ephemeral Drainage Lines: Surface Water Run-Off Areas

- Several 1:50 000 drainage areas occur on the farm along the lower-lying valley areas.
- The 1:50 000 drainage lines do not have defined channel banks, beds and riparian zones; and are commonly referred to as surface water run-off areas.
- In some of the drainage areas, however, the drainage area was discernible on the basis of a change in vegetation cover to 'grassland' dominated by species such as *Chloris digitata*, *Eragrostis lehmannii*, *Panicum deustum* and *Eragrostis obtusa*.
- These drainage lines are ephemeral in nature that probably present with very limited sheet flow during high rainfall events.
- The drainage lines drain towards the non-perennial, un-named river.
- The drainage areas are utilized by wildlife as they are open access, areas, acting as footpaths through the Sundays Spekboom Thicket.
- On the northern portion of the farm (north of the MR00470), access tracks and grazing occur within the valley areas along these drainage lines. In other words, these areas have been transformed to grassy, shrubby areas; and access tracks.
- In addition, past intensive cultivation has impacted on and transformed portions of these drainage areas.
- Notwithstanding the degradation and transformation (irreversibly and reversibly modified), most of the catchment area is in a moderately modified state or near-natural state with degradation.

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<sup>1</sup> The previous landowner (a tenant at the time) has received notification to vacate the property and it has been confirmed by the project applicant, Ikamva Lethu Farms (Pty) Ltd, that the property has been vacated and the sausage casing facility operations have ceased (May 2017).

The ephemeral drainage areas could not be assessed via the standard PES methodology (Kleynhans et al., 2008), which requires a marginal and non-marginal zone, with typical riparian indicator species and/ or obligates. Thus, the PES was based on the vegetation condition of the catchment and drainage areas, which was determined for the Vegetation Assessment (Chapter Six). Some clearing in the past has occurred along stretches of the watercourses, while some of the vehicle access tracks follow the drainage lines or cross the drainage lines. Artificial wetlands (dams) with berming negatively impact on the PES of the drainage area to the south-west. The PES of these drainage areas is considered to be Moderately Modified (Class C).

The following mitigation and management is recommended to protect the aquatic resources on site:

- Adopt the recommended biodiversity No-Go areas including the 20m buffer around the wetlands and ephemeral drainage areas.
- Adopt the recommended 100m buffer around the non-perennial watercourse.
- Further comment from the Department of Water and Sanitation with regards to requirements of Section 21c and 21i of the National Water Act (36 of 1998).
- Existing access tracks to be used as part of the proposed agricultural development to prevent the establishment of numerous additional watercourse crossings.
- Installation of the pipeline across the Sundays River should take place during the dry season when flows are lowest to avoid high rainfall periods and flood peaks.
- Ensure that the extent of the pipelines' construction footprint is as small and narrow as possible, to reduce the amount of vegetation cleared and bank excavated where the pipeline is installed across the Sundays River. Reducing the 7m wide construction footprint is encouraged. To avoid indiscriminate clearing in the sensitive wetland and riparian habitats, demarcate the extent of the construction footprint (Works Area) using non-perishable poles or other solid material for the duration of the construction work and rehabilitation phase.
- Immediate rehabilitation of disturbed areas on the banks of the Sundays River by indigenous species, equivalent to those removed during the construction period. Topsoil and subsoil to be stored separately and replaced in that order, for rehabilitation purposes.
- Stormwater and erosion control measures should be implemented e.g. the use of bidum / hessian or other suitable materials, erosion berms and/ sediment traps when installing the pipeline across the Sundys River.
- Stormwater should be diverted from the construction footprint to prevent erosion and sedimentation along the banks and into the Sundays River and the banks must be re-shaped to their original form (shape, slope) post construction.
- A low-level gabion crossing to be constructed over the non-perennial water course to facilitate the re-alignment of the access road. The gabion structure road crossing will as far as possible follow the natural contours of the site and will allow the natural flow and seepage of water during and after rain conditions but will limit the transport of sediment.
- In order to reduce surface water run-off from orchard areas, establish stormwater management measures, including trenches (with indigenous grasses, not concrete lined) to encourage increased infiltration.
- Limit vegetation removal during the construction/ establishment phase to the proposed development footprint.
- Fertilizer applications should be used at the right time and at the required rates (i.e. excess fertilization can increase available nitrogen or phosphates entering aquatic features).
- Use of slow release nitrogen fertilizers are encouraged as this can improve nitrogen efficiency and reduce leaching of nitrogen.
- Avoid over irrigation. Drip irrigation is encouraged/ supported (as is the standard practice to reduce loss or over-use of water).
- The use of organic fertilizers and mulching is encouraged, as much as possible.
- Strict use and management of potential sources of chemical pollution (e.g. pesticides, fertilizers, hydrocarbons from vehicles and machinery, etc.) i.e. waste management procedures.

- Chemical pesticides and insecticides used should be the safest and least harmful to the environment. Biodegradable products should be used as far as possible.
- International standards to be complied with.
- Chemicals and hazardous waste storage areas should be in the existing storage buildings (as proposed).
- Hazardous and chemical wastes (includes old containers) should be disposed of at registered landfill sites.
- Implement appropriate measures and soil drainage to prevent increase in the salinity of water table and surface water features i.e. Wit River and tributary etc.
- Mulching, if feasible, to increase retention of soil moisture in-situ/ at tree.
- Minimizing bare and exposed soils and implementing drip irrigation (as proposed/ standard practice).
- Audit reporting by the Environmental Control Officer during establishment of orchards.
- These buffers and mitigation measures should be maintained and monitored by the Applicant/ Farm Manager.

#### 14.2.2 Summary and Additional Recommendations

The proposed agricultural development is not deemed to be a fatal flaw on condition that the recommended no-go areas, as indicated in Chapter Six (and the proposed layout in Appendix H)), are adopted and *all* the recommended mitigation measures implemented. This will ensure that the biodiversity pattern target area for the various vegetation types, and the hydrological/ ecological process areas associated with aquatic features (Chapter Seven), will be safeguarded.

It should however be noted that the final proposed layout results in extensive areas being excluded from agricultural development. These agricultural exclusion zones are essentially CBA i.e. no-go agricultural areas. These final no-go areas exceed the targets delimited on the SRV CBA Map and can be interpreted as a positive outcome in terms of preserving biodiversity on Farm 653. It should also be noted that all of the Bontveld vegetation type on the farm will be retained (~81.59ha).

The proposed underground pipeline is assessed as having a low impact on biodiversity, not only because it follows, for the most part, the existing road network, but because it is a temporary impact that requires rehabilitation post construction.

The following table provides a summary of the key direct and indirect impacts associated with the development. Only impacts that are rated as having a potential *Medium to High or Very High* negative impact are listed below:

*Table 14.2: Key direct and indirect ecological impacts (Medium to High Negative pre-mitigation only).*

ENVIRONMENTAL IMPACT	DEVELOPMENT PHASE	PRE-MITIGATION	POST-MITIGATION
Loss of vegetation due to clearing for agricultural activities	Establishment	(Albany Alluvial Veg) MEDIUM	(Albany Alluvial Veg) LOW
		(Sundays Spekboom/ Koedoeskloof) HIGH	(Sundays Spekboom/ Koedoeskloof) MEDIUM
Loss of Critical Biodiversity Area and Ecological Support Area due to clearing of vegetation for agricultural activities	Establishment	HIGH	NEUTRAL

Loss of Critical Biodiversity Area due to clearing of vegetation for the proposed pipelines	Establishment	MEDIUM	LOW
Loss of species of conservation/special concern due to clearing of vegetation for agricultural activities.	Establishment	MEDIUM	LOW
Fragmentation of habitat due to clearing of vegetation for agriculture	Establishment	MEDIUM	LOW
Loss of CBA and ESA buffer areas along the non-perennial watercourse, due to clearing of vegetation	Establishment	HIGH	NEUTRAL
Loss of wetland habitat and riparian systems along the drainage areas, due to vegetation clearing	Establishment	(Wetlands) MEDIUM	NEUTRAL
		(Drainage Lines) HIGH	
Loss and disturbance of wetland and riparian habitat along the Sundays River, due to vegetation clearing for the proposed pipelines	Establishment and Operational	MEDIUM	LOW
Potential loss of 'riparian' system along the non-perennial watercourse, due to the access road	Establishment and Operational	MEDIUM	LOW
Potential sedimentation and erosional impacts on wetland habitats, due to agricultural activities	Establishment	MEDIUM	LOW
Potential sedimentation and erosional impacts on the non-perennial watercourse and associated wetland habitats, due to agricultural activities	Establishment	MEDIUM	LOW
Potential increased water levels/ saturation in the wetland habitats and the non-perennial watercourse, due to drip irrigation	Operational	MEDIUM	LOW
Potential changes to the local water quality of the wetland habitats and the non-perennial watercourse due to return agricultural run-off high in nutrients or insecticides, herbicides / pesticides etc	Operational	HIGH	LOW
Loss of faunal Species of Special Concern due to vegetation clearing	Establishment	MEDIUM	LOW
Destruction of faunal habitat	Establishment	HIGH	LOW
Loss of faunal Species of Special Concern due to poaching	Establishment and Operational	MEDIUM	LOW
<b>CUMULATIVE IMPACTS</b>			
Potential cumulative loss of vegetation due to clearing	Establishment	HIGH	MEDIUM
Potential cumulative loss of CBA and ESA due to clearing of vegetation	Establishment	MEDIUM	LOW
Potential cumulative loss of species of special concern due to clearing of vegetation	Establishment	MEDIUM	LOW
Cumulative loss and modification of wetland habitat in the larger catchments	Establishment	HIGH	MEDIUM
Cumulative impacts on hydrological process of watercourse and riparian areas in the N40E catchments (flow, water quality, erosion, sedimentation etc.)	Operational	HIGH	LOW

It is recommended that the following are included as conditions in the Environmental Authorisation:

- No-go areas for development (including aquatic and ecological buffer areas) must be demarcated on site before vegetation clearing commences.
- Any lay-down areas must be contained within the proposed disturbance area and may not encroach on any no-go areas on the site.
- Before site clearing commences, the development area must be surveyed for plant and faunal SSC by a suitably qualified specialist. Plant species of special concern must be translocated to the remaining patches of intact vegetation or buffer areas on the property. Permits must be obtained from the relevant authorities for the removal or transfer of protected flora and faunal species.
- No fauna encountered on site to be intentionally harmed.
- Exotic plants present on the site, which are listed in CARA (Conservation of Agricultural Resources Act 43 of 1983) should be progressively removed from the site. In addition, regular follow-up clearing should be conducted for the duration of the project lifetime to ensure that the No-go areas are kept free of these plants.
- The ECO must monitor the construction activities and vegetation clearing associated with the installation of the pipeline through the Sundays River and ensure that rehabilitation of these disturbed areas be effected immediately after completion of installation of the pipeline through the river.

### **14.3 HERITAGE IMPACTS AND RECOMMENDATIONS**

#### **14.3.1 Palaeontological, Archaeological and Historical Background**

According to the 1:250 000 scale geological map 3326 Port Elizabeth, the study area is underlain by marine and estuarine sediments of the Early Cretaceous Sundays River Formation. The Sundays River Formation contains rich fossil faunas of marine invertebrates such as ammonites, belemnites, bivalves and gastropod shells. Plant remains, vertebrate fragments (including the almost complete marine plesiosaur discovered near Redhouse) and microfossils (forams, ostracods) are also common (Shone 2006). The formation is linked to a shallow marine depositional environment that may have included lagoon, estuarine and shallow shelf settings (McClachlan and Mcmillan 1976). Good exposures of the Sundays River Formation sediments, comprising grey-green sandstones siltstones and mudstones with thin shell-rich limestone beds, are visible in the cliffs bounding the Sundays River, ~6km north of the study area.

Earliest human habitation in the Sundays River Valley is indicated by the presence of bifacial stone tools, which are assigned to Early Stone Age (ESA). ESA bifaces that possibly dates back to between 1.5 million and 300 000 years ago, and younger. Middle Stone Ages flake-blade industries generally occur as contextually derived individual finds on the landscape or occasionally as capped assemblages within Quaternary alluvial deposits. Stone Age sites have been recorded along the Sundays River Valley near Addo and Kirkwood. The incidence of surface scatters usually declines further away from localized areas such as riverine or spring sites. At Amanzi Springs, west of Grassridge near Addo, ESA *in situ* artefacts were found along with well-preserved plant and faunal remains within spring sediments (Deacon 1970). Cave and rock shelters in the adjacent mountains to the north and east of the site frequently contain archaeological remains and rock art associated with San hunter-gatherers who inhabited the area during the last ten thousand years (Deacon 1976). The Melkhoutboom Cave, located in the Zuurberg Mountains, is a Later Stone Age site that dates back 15000 years. Nearby rock paintings in the Zuurberg confirm that this area was inhabited by San hunter-gatherers. Khoi pastoralists occupied the region some 2000 years ago and introduced domesticated animals and pottery to the region (Deacon 1984). Khoi pastoralist sites are often found close to the banks of large streams and rivers and fresh water shell middens are often left as evidence of their stay. Khoi groups who lived in the area during historical times

include the Iqua, Damasqua and Gonaqua clans. The Suurberg area is also known for numerous skirmishes that took place between the Xhosa inhabitants, European settlers, British military and Khoi pastoralists during the 18<sup>th</sup> and 19<sup>th</sup> centuries and some historical remains related to these events may still be preserved.

### 14.3.2 Heritage Resources Identified

The Sundays River Formation outcrop is poorly exposed within the study area, which is capped by well exposed, thick orange-brown sandy soils, hillwash and poorly sorted reworked gravels. Although visibility was obscured by the dense thicket vegetation, scatters of uncapped Middle Stone Age stone-tool artefacts were found in secondary context, within the reworked and downwasted gravels capping the hill tops, drainage lines and vehicle tracks. Some evidence was found for the accumulation of reworked stone tools within the Quaternary sediments covering the underlying sedimentary rocks. The artefacts are mainly represented by large, irregular flakes with faceted striking platforms, chunks and reduced pieces made from quartzite.

Except for a farmstead, assorted farm buildings and the existing dam, no other historically significant structures or archaeological sites were recorded. A small graveyard is located ~750m southeast of the farmstead (GPS coordinates 33°32'25.78"S 25°34'49.29"E).

The irrigation pipeline footprint is proposed in the reserve of a proclaimed public road (MR00470) on degraded terrain, as well as across four properties. The proposed pipeline route traverses farmland from the canal offtake point at the LSRWUA canal system, the other side of the Sundays River, to the proposed termination point at one of the new dams proposed for construction on Farm 653. The pipeline footprint is underlain at depth by Quaternary Alluvium along the Sundays River floodplain. There are no indications of aboveground prehistoric structures, graves, graveyards or historical structures older than 60 years within the proposed pipeline footprint.

### 14.3.3 Impacts and Management of Heritage Resources

The potential impact by the development on below-ground fossils is considered *negative* and *irreversible*, but localised, and will be limited to the construction phase of the project. Potential palaeontological impact during the construction and operational phase of the development is considered *moderate* to *slight*, since the proposed citrus development will be restricted to areas where superficial sediments (topsoils, alluvium, hillwash etc.) occur at depth. It is further expected that the Quaternary Alluvium underlying the Sundays River floodplain will largely buffer the impact of excavations into unweathered sedimentary bedrock.

The potential impact on palaeontological resources is assessed as *High Negative* which can be mitigated to a *High Positive* impact. Thus, there are no major palaeontological grounds to halt the proposed development.

There are no indications of aboveground prehistoric structures, open sites or rock art within the survey area. Further, no evidence of historically significant structures older than 60 years were observed at the site or along the pipeline footprint. A historical monument, known as "The Lookout", is located ~90m east of the pipeline route on the northern bank of the Sundays River and will not be impacted on by the development (Oberholster 1972). The survey has yielded a number of stone tools distributed as contextually derived surface scatters at the site. The artefacts could not be associated with intact archaeological open sites. However, isolated to multiple uncapped stone tool scatters (incl. mixed or downwasted assemblages) were widespread. Regarded within

the context of cultural landscape, the weathered/ *ex situ* stone tool scatters can be viewed as a clear indication of early human presence on the landscape.

Potential impacts on archaeological material or artefacts is assessed as *Low Negative* which can be mitigated to *Neutral*. Thus, there are no major archaeological grounds to halt the proposed development.

The following actions are recommended:

- The Construction Manager should monitor >1m deep excavations into freshly exposed sedimentary bedrock during the construction phase of the project, in particular the dam construction and expansion.
- The Construction Manager should be informed about the possible type of fossils (shell beds, ammonites) that may be encountered within the sedimentary bedrock.
- If any palaeontological heritage or human remains (or any other concentrations of archaeological heritage material) is identified on site, this must be reported immediately to the ECPHRA (Mr Sello Mokhanya, Tel: 043 745 0888; smokhanya@ecphra.org.za). Ideally the fossil material should be left *in situ* until a palaeontologist / archaeologist has provided input as to how to proceed with regard to mitigation.
- The graveyard must be avoided and protected by a 25m no-go buffer zone.
- Middle Stone Age artefacts may occur as capped assemblages within the Quaternary Alluvial deposits flanking the Sundays River. The Construction Manager should be aware of possible accumulations of undisturbed flaked stones when >1m deep trench excavations are to be conducted into unconsolidated sediments, during the construction and installation of the irrigation pipeline.
- However, the ECO (must be trained) must monitor the clearing of the vegetation and if concentrations of archaeological materials and/or human remains are exposed then all work must stop for an archaeologist to investigate.
- An archaeologist should conduct a walkthrough of the area after the vegetation is cleared to check if any significant sites/ materials were exposed. Further recommendations will follow after the investigation.

#### 14.4 TRAFFIC IMPACTS AND RECOMMENDATIONS

The following conclusions can be drawn from the traffic specialist study:

- Access to the new orchard areas can be provided directly from MR470 at the locations indicated (see Chapter Eight) as long as the primary access point is re-aligned so as to be opposite the existing access located north of the road;
- A total of 19 tractor-trailers or 24 interlink trucks generated at full development during harvesting season will have minimal impact on the operational capacity of the adjacent road network;
- The proposed access points are positioned such that sight distances are in excess of the prescribed minimum requirements.

Table 14.3 below provides a summary of the key direct and indirect impacts associated with the development that have been identified by the traffic specialist. Only impacts that are rated as having a potential *Medium to High or Very High* negative impact are listed below:

Table 14.3: Key direct and indirect traffic impacts (Medium to High Negative pre-mitigation only).

ENVIRONMENTAL IMPACT	DEVELOPMENT PHASE	PRE-MITIGATION	POST-MITIGATION
Traffic Safety Impact due to slow moving traffic	Establishment	HIGH	MEDIUM
Traffic Safety Impact due to additional traffic	Operational	HIGH	MEDIUM
Deterioration of Public Road Network	Operational	HIGH	LOW
Generation of Dust	Operational	MEDIUM	MEDIUM POSITIVE

In view of the findings of this study, it is recommended that:

- This TIA be approved by the Eastern Cape Department of Roads and Public Works of the Eastern Cape;
- Access to the proposed development be provided via the existing and proposed access points on MR00470 as indicated in the proposed layout plan, with any cost relating to the access points to be met by the developer;
- The existing primary access point to be re-aligned so that it is positioned opposite to the existing access located north of the road;
- MR00471 and MR00470 to be maintained on a regular basis;
- Suitable warning signage be erected on the approaches to the proposed access points.

#### 14.5 VISUAL IMPACTS AND RECOMMENDATIONS

The area proposed for the Ikamva Lethu agricultural development is in a region that transitions from intensively cultivated farms in the Sundays River Valley to the north and east of the site, to naturally vegetated lands used for game or stock farming south and west of the site. The site itself is covered in natural and disturbed vegetation and was historically used for stock farming and other small scale agricultural activities. There are areas in the surrounding game farms where some sense of wilderness and remoteness can be experienced, particularly within thicket areas that limit views. *However, where open views are available it is very likely that these views include elements of cultivated land and settlements, and structures associated with that landscape.* The proposed site for the development is also bordered to the north east by cultivated land which also contains a five-star lodge. There are also other tourist accommodation and attractions in the cultivated landscape of the Sundays River Valley, where both landscape types are included in the marketing of these operations.

It is, therefore, clear that a development, such as proposed for Ikamva Lethu, is not unexpected in the region and that in most cases it will cause low visual intrusion on existing views. Visitors to game farms in the surrounding landscape are likely to be aware of their surrounding environment (i.e. that they are within an intensively cultivated region with large structures, high levels of activity and a relatively high population). *Visual intrusion caused by the proposed development is at most moderate* for these receptors – it will be easily recognised but will also partially fit into the landscape.

Construction activities associated with the pipeline are unlikely to cause much visual intrusion on existing views since the activities will be familiar in a region, where irrigation is a major aspect of the landscape, and views are limited by high trees and buildings.

The construction phase of the development will be phased over 7-years, which is a relatively long time for construction activities and as such it is recommended that owners of neighbouring game farms (i.e. those with high visual exposure areas in the viewsheds) be informed in advance of each phase so that they can adjust their operations to avoid as much of the impact as they can.

Construction activities will potentially cause *low significance visual impact* as a result of the proposed development, as well as along the proposed pipeline route, if mitigation measures are successfully implemented.

The overall *significance of the landscape impact is very low*, since the landscape of the area will accommodate the proposed development without changing the landscape character type.

The *visual impact of the proposed development will have low significance*, since there are very few highly sensitive visual receptors that will be affected and the consequence of the impact on them is rated as *medium*.

#### **14.5.1 Recommendations**

##### Planning and Design Phase

There are some mitigation measures that require input during the design and planning phase of the proposed project, in order to reduce visual intrusion of construction activities. These include plans to minimize fire hazards and dust generation, and rehabilitation plans for areas temporarily cleared during construction. Sites for construction camps and laydown areas should be located in low visibility areas, existing disturbed areas and/ or areas near disused farmsteads and buildings, or where existing trees can be used to screen these sites from views. A lighting plan for the project which protects the surrounding nightscape from light pollution and prevents annoyance of glaring lights onto neighboring properties should be set in place.

##### Construction Phase

Adherence to the erosion, dust, fire and light plans are necessary to minimise visual intrusion of construction activities and should be monitored regularly by the construction manager. Construction boundaries should be clearly demarcated and monitored, and good housekeeping on site should be maintained. Rehabilitation of temporary cleared areas should commence as soon as possible, and the rehabilitation process should be regularly monitored by the Environmental Officer.

##### Operational Phase

A maintenance plan for buildings and structures should be followed to ensure that structures remain reasonably unobtrusive. Maintenance of access and service roads should not cause further disturbance and damage to the surrounding landscape.

Considering this VIA and the overall low significance of the potential visual impact, there is no reason that this project should not be authorised and from a visual impact perspective, the proposed development is acceptable.

#### **14.6 SECURITY RECOMMENDATIONS**

While no “formal” impact assessment was undertaken with regards to the potential security which the development may pose during the construction and operational phase of the project, a independent specialist did evaluate this assertion and provided some comments on buffers and other measures to reduce potential security risks.

##### **14.6.1 Factors Influencing Poaching Threat or Poaching Probability**

- Vegetation serving as concealment to poachers;
- Proximity of reserve to roads (escape routes);
- Weather;

- Astronomical conditions (moon phase, natural illumination);
- Distance of rhino from points of entry into reserve;
- Location of waterholes, middens, mud wallows;
- Topography – vantage points;
- Interior security measures in place (Anti-Poaching capacity);
- Knowledge of rhino locations by the public, employees, criminals;
- Previous or current criminal activity near entry points/ fences;
- Terrain – is terrain conducive to successful infiltration/ exfiltration by poachers;
- Availability of grazing;
- Perceived risk of detection by poachers;
- Crime patterns;
- Human activity/ settlements in proximity to target area;
- External policing or lack thereof;
- Availability of crime intelligence;
- Activity or criminal strongholds in precinct.

The factors mentioned above are not exhaustive, but it will play a pivotal role in the rhino security of Mr. van der Westhuizen's property, whether the proposed development proceeds or not. Concerns were raised that Ikamva Lethu staff members *may* increase the risk of poaching during the development phase if they see rhino or exotic game. Of the eighteen (18) factors influencing poaching, the fact that only one factor *may* change namely, the possibility of Ikamva Lethu staff seeing rhino or exotic game, does not automatically elevate the poaching risk.

For this specific factor to come into play and become relevant, the following elements must manifest:

- We must assume that some Ikamva Lethu employees/ contractors are criminally inclined;
- Have access to instruments to poach namely rifle, ammunition, etc.;
- Have opportunity i.e. access to the property where rhino/ game are kept;
- Have motive;
- Be reasonably sure that their actions will go unnoticed or undetected.

It is foreseen that local contractors and community will be utilized as the workforce during both the development and production phases of Ikamva Lethu. The workforce will be managed and closely supervised which will further minimize security risk, if any. Further, it can be argued that it is local knowledge that Mr. van der Westhuizen keeps rhino and exotic animals, therefore, it would not be new information to any local workforce. A workforce, and specifically its propensity to commit crime, can be managed with confidence by skilled security and human resource staff. Dynamic and static factors amongst staff and contractors, both internal and external, can be successfully monitored, mitigated and managed.

#### **14.6.2 Observations**

During the site visit, the following was established:

- Two (2) of the proposed Ikamva Lethu development's fence lines border Mr. van der Westhuizen's property. The fence line bordering Farm 4/ 632 is ~1.6km in distance, while the fence line bordering Farm 83/ 558 is ~1.1km in distance. The total distance of fence line which may be impacted on is thus ~2.7km.
- Two (2) hunting towers, both situated a few hundred meters (estimated at ~600m) from both above-mentioned fence lines, were observed.
- Vegetation on Ikamva Lethu is such that Mr. van der Westhuizen's fence line is invisible 90% of the time, if viewed from 200m away. There is at least one (1) site where Mr. van der

Westhuizen's fence line is visible from ~300 meters, but with plain unaided eyesight the view is tainted.

- Topographically, Ikamva Lethu is lower and sloping away from Mr. van der Westhuizen property as correctly stated by Attorney Vosloo. This fact makes it hard and mostly impossible to see Mr. van der Westhuizen's property from 200m away.
- No rhino, rhino middens or waterholes could be seen near the above-mentioned fences.

#### 14.6.3 Buffer Zone

The buffer zone adjacent to Mr van der Westhuizen's property (Farm 4/632 and 83/558), which has been determined as a result of biodiversity constraints (e.g. soil suitability, vegetation conservation, aquatic buffers), will serve as an adequate early detection zone (EDZ) and in addition will hinder sight into Mr. van der Westhuizen's property. In line with the biodiversity constraints, this buffer zone will be at a minimum of 300m wide. The natural vegetation and topography on or near the communal boundaries with Mr. van der Westhuizen's property forms a virtual buffer zone.

While it is not a required recommendation of this report to erect additional fences, it is noted that Ikamva Lethu will fence in the developed portion of their site, in order to secure their product.

The buffer zone will not be implemented as a precaution against stray bullets *as that should and must never happen*. In line with the biodiversity constraints and recommendations of the various specialists, access to the buffer zone should be restricted. Warning signs should be strategically posted on the inner perimeter of proposed buffer zone to indicate to staff that access to this area is restricted.

#### 14.6.4 Security Strategy Proposal

The following strategy has been proposed to improve security on Farm 653 during the construction and operational phases.

	ACTION STEPS	IMPLEMENTATION DATE
1.	Vetting of all new employees/ contractors.	Prior to commencement of employment – March 2019 – Phase 1
1.1.	All new employees to complete pre-employment security questionnaire.	To be repeated with new employees/ contractors.
1.1.1.	Questionnaire processing and capturing on database. Filing of identity document copies.	Sept 2019 Jan 2020 Aug 2019 <b>Phase 2</b> March 2020
1.2.	<ul style="list-style-type: none"> <li>• Applicants with elevated risk profile to be identified pre- employment.</li> <li>• Criminal vetting</li> </ul>	Sept 2020 Jan 2021
2.	Security induction meeting with all new employees/ contractors and sign-off of induction. Hard copy of	1 April 2019 for Phase 1 and thereafter to any new group commencing employment.
2.1.	Ikamva Lethu site security procedure issued to every employee/ contractor.	
3.	Random visible security presence in buffer zone. At least once a week including sweeping operations of fence for snaring and signs of human activity.	Commence April 2019
4.	Enhanced/ elevated communication with security providers and plug into existing crime information systems and pre-warning alerts with regards to poaching suspect activity/ movement.	From commencement of development
5.	Any security breach/ compromise to be investigated swiftly and dealt with decisively.	As incidents occur
6.	Permanent on site – Security Supervisor with vehicle to facilitate and conduct abovementioned actions 1 – 5.	Commence April 2019

## **14.7 LOGISTICAL SERVICES AREA DESIGN AND RENOVATIONS RECOMMENDATIONS**

Existing buildings on site are proposed to be renovated in order to provide the necessary administrative and logistical support for the proposed citrus development. While the footprints of the existing buildings are not proposed to be expanded, existing infrastructure associated with these facilities will require upgrading and expansion, including the installation of new supporting infrastructure e.g. water reticulation, internal roads, access roads and access points.

A Roads and Wet Services Report (Chapter Eleven) has been prepared by a suitably qualified professional, in order to determine the capacity of the existing services to accommodate the administrative staff, as well as the residents associated with the proposed development. Recommendations have also been provided regarding road alignment and structure as well as stormwater management.

### **14.7.1 Roads**

The new access to the proposed logistical area is proposed ~95m east of the existing access to the site, off the MR00470 and has been designed with the applicable stacking distance and radii to ensure the required mobility and safety of traffic in accordance with the accepted guidelines. The existing access road will also have to be re-aligned so as to accommodate the new primary access point. The re-alignment of the access road will result in a crossing of the non-perennial watercourse. It is thus proposed that a low-level gabion crossing be installed at this point.

The preferred width of the main internal distributor area should preferably be a minimum width of 8m wide near the entrance to the site. Subject to the applicable trip generation figures, the width of the other main internal access areas should vary between 8m and 4m. The formed-gravel, paved and/ or concrete surface areas will, as far as practically possible, be designed to accommodate the sheet flow of stormwater.

### **14.7.2 Stormwater**

The proposed primary access road to the logistical area has been designed to ensure minimum interference with the natural stormwater flow conditions and not to concentrate stormwater as far as practically possible.

The low-level road crossing at the non-perennial water course will consist of a 1m deep non-rigid gabion structure complete with a geotextile filter cloth. The top of the gabion crossing will as far as possible follow the natural contours of the site. The gabion structure road crossing will allow the natural flow and seepage of water during and after rain conditions but will limit the transport of sediment.

In areas where vertical road gradients are steeper than 1:10 or where the road lends itself to intercept the natural flow of stormwater, it is advisable to construct earthen berms. The earthen berms will divert and limit the concentration of the intercepted run-off on the road. The mentioned berms will distribute the run-off on the road to the lower-lying area to prevent the risk of excessive erosion. In addition, it is recommended that indigenous drought-resistant ground cover (or grasses) be established, on the disturbed cut and fill areas, as well as the verges and berm outlets of the constructed road and turning facility, to limit the transport of sediment in these affected areas by water and/ or wind and resultant erosion.

### 14.7.3 Water

The office/ administration facility will accommodate 10 personnel members. The permanent dwelling will have a maximum of 5 persons. The total domestic water demand for the logistical area will be 1.7m<sup>3</sup> per day.

In brief, the following water supply system is proposed on site in order to supply domestic water for the 10 administration personnel and 5 permanent residents:

- Roof rainwater harvesting will serve as the primary source of domestic water.
  - The gutter system of the existing store roof, office and permanent residence must be upgraded, in order to effectively intercept and convey the surface run-off of the rainwater to the proposed rainwater storage tanks to be erected adjacent to the buildings.
  - Tank storage capacity is recommended to be 10 000 litres each
  - To ensure adequate pressure the applicant must install a tank / pressure pump system near the office and permanent residence.
- Treated canal irrigation water will serve as a backup supply.
  - A water treatment plant is required to treat the irrigation water for domestic use.
  - The water treatment plant should be located near the store building to ensure a positive static pressure of 100kPa.
  - The water treatment plant should be designed to treat at least 2000 litres of irrigation water per day and should have the following components:
    - 5000 litre sedimentation and flocculation tank (canal irrigation water)
    - Dual media sand filter
    - A chlorinator
    - 5000 litre domestic water storage tank

The use of water can also be saved by using water saving products listed as follows:

- Water saving toilets (capacity 6 litres and less) with a dual-flush valve
- Water saving taps with spray cartridges
- Water-saver shower heads with a flow rate of 4 to 9 litres per minute, by generating finer droplets
- Timed turn-off taps

Ornamental gardens could also be merged with natural and indigenous vegetation (with relative low water consumption if possible) subject to investigation by a vegetation specialist.

### 14.7.4 Domestic Effluent System

The Average Dry Weather Flow (ADWF) of the logistical area has been calculated as 1.6m<sup>3</sup> per day, for the 10 administration personnel and 5 permanent residents. The two farm houses which will be used for the administration and the permanent residents were previously occupied by 9 permanent residents. In accordance with our design calculations, the ADWF generated by the 9 permanent residents was 1.69m<sup>3</sup> per day which is more than the projected future ADWF of 1.60m<sup>3</sup> per day.

The aquatic specialist visited the site while the previous 9 permanent residents were still living on the farm. Based on the comments of the aquatic specialist, no signs of pollution of the watercourses could be found as the result of the operation of the existing septic tanks.

Given the afore-mentioned comments and design calculations, the Engineering specialist is of the professional opinion that the existing septic tank system can treat the future domestic effluent effectively subject to the following conditions.

- Once a year a competent person shall execute testing to evaluate the probability of contamination of the watercourses as the result of the septic tank system when the proposed logistical area is in full operation.
- If the tests show that contamination can be a problem, then the existing septic tanks shall be upgraded to conservancy tanks as designed by a specialist.
- The domestic effluent of the proposed mixed development will mainly be treated by the Addo Waste Water Treatment Works as confirmed with the Acting Technical Director: Technical Services: Mr R.J. Herholdt of the Sundays River Valley Municipality on 11 September 2017.

The Governing Body of Ikamva Lethu Farms (Pty) Ltd will be liable for the effective maintenance and/or emptying of the septic tanks (once every 5 years or at regular intervals as deemed necessary) serving the logistical area under discussion. Further, the Governing Body of Ikamva Lethu Farms (Pty) Ltd will enter into an agreement (as approved by the local authority) with a competent registered Contractor for the applicable emptying of the septic tanks when needed and discharge of the mentioned raw effluent to the registered Addo Waste Water Treatment Works in Addo.

#### **14.7.5 Chemical Store**

One of the existing buildings on the farm will be renovated so as to accommodate a chemical store with a capacity to temporarily store 30m<sup>3</sup> of chemicals. Based on the extent of Farm 653 (~1163ha), the proposed orchard area (~586ha), the preferred cultivar to be planted (lemons), and the treatments required, the maximum weekly volume of chemical product (using a worst-case scenario for the Sundays River Valley area), has been calculated, by the SRCC's Chief Agronomist, as 21 280L. Therefore, the proposed capacity (30m<sup>3</sup>) will be sufficient to store a full week's worth of chemical products on Farm 653. Recommendations regarding the design and management of the chemical storeroom have been included in Chapter Two and Appendix G, respectively, of this report.

### **14.8 ASSESSMENT OF ALTERNATIVES**

The following alternatives were identified for consideration in this assessment:

- No-go alternative;
- Property/ location alternatives;
- Land-use alternatives:
  - Grazing/ game;
  - Citrus production; and
- Layout/ development footprint alternatives
- Irrigation infrastructure alternatives

The preferred alternatives from the list above as contemplated in detail in Chapter Five are summarized below.

#### **14.8.1 No-Go Option**

The no-go option would result in the loss of potentially productive agricultural land in an area known for citrus production and at a site that is largely surrounded by agricultural development. The no-go option would result in the loss of a capital investment estimated to be approximately R225 million. The operational phase of the project will result in the creation of 62 permanent employment opportunities with an annual income of approximately R2.2 million and 566 seasonal employment opportunities with an additional annual income of R6.8 million. In addition, given that this proposed agricultural development is an empowerment project the benefits to the potential

beneficiaries will not be realized. The no-go option would result in a loss of these economic opportunities, as well as the increased production of food for local and international markets, which is considered to be a negative impact. While the no-go option will have no significant negative biophysical environmental impacts, it will result in the loss of positive social and economic benefits which are associated with the go option. Finally, the no-go option will result in the Farm not being optimally utilized for agriculture, for which it is zoned and well-positioned.

#### 14.8.2 Property/ Location Alternatives

Prior to purchasing Farm 653, the applicant investigated the purchase of another farm located on the R75 towards Jansenville, near Glenconner. The properties included the Remainder and Portion 3 of Farm Skietnek No. 82 and the Remainder of Farm Felsenheim No. 81 and measured ~1436ha in combined extent.

However, a number of limitations to development on these farm portions were identified and thus they were not considered suitable by the project applicant for the proposed Ikamva Lethu Farms (Pty) Ltd agricultural development and thus, purchase of the property did not proceed. **These farm portions were, therefore, not considered to be a preferred location/ property alternative.**

Prior to purchasing the Farm 653 a Rapid Environmental Risk Assessment was undertaken by Public Process Consultants, on behalf of the applicant, in order determine the environmental constraints and potential sources of risk of an agricultural development of this nature on the farm. The farm measures ~1163ha in extent.

The following conclusions were made in that report with regards to the development potential of the Farm 653:

- An area of ~830ha was determined to be suitable for agriculture (“Go Areas”).
- Approximately 74ha of the 830ha have been indicated as “Marginally Recommended” and would require detailed analysis to establish whether they would be suitable for citrus production.

Unlike the Skietnek properties, Farm 653 is located adjacent to some agricultural development (adjacent to the north-eastern boundary of the farm) and there is existing infrastructure on the farm which can be utilized to service the proposed agricultural development. The LSRWUA canal is located ~6km (as the crow flies) north of the farm. In addition, the Farm was not identified as falling within a National Protected Area Expansion Strategy (NPAES) Focus Area. The farm is located ~2km south of the “Valley”, which is renowned for its citrus cultivation, other intensive agricultural practices and associated supporting industries (packhouses, co-op and juicing facilities).

Given the above, Farm 653 is considered a suitable location for the proposed agricultural development and is thus the **preferred property/ location alternative.**

#### 14.8.3 Land Use Alternatives: Citrus Production

As outlined in Chapter One of this report, the Farm is located in the SRVM and is zoned for agriculture. In terms of the Section 8 Zoning Scheme Regulations this “*means the **cultivation of land for crops and plants** or the breeding of animals, or the operation of a game farm on an extensive basis on the natural veld or land, and includes only such activities and buildings as are reasonably connected with the main farming activities of the farm, but does not include the consent uses applicable to agriculture zone 1.*” The applicant specifically purchased this property for the intended purpose of establishing citrus orchards thereon.

The applicant has obtained a water use license for the taking of water from a water resource in terms of section 21 (a) of the National Water Act which entitles them to utilise 675ha of water from the LSRWUA canal system for the proposed citrus development on the Farm 653. Various conditions are attached to the water use license, which amongst others, requires Ikamva Lethu PTY Ltd to maintain the shareholding of the Workers Trust and within SRCC Growers Trust for staff/ employees at 59% or more of the total shares at all times. The applicant has also been granted a permit in terms of Regulation 2 of the Conservation of Agricultural Resources Act 1983 (CARA) for the cultivation of virgin soil, issued by the Department of Agriculture, Forestry and Fisheries, (DAFF) for the establishment of citrus on the Farm.

The Farm 653 is located adjacent to some agricultural development (north-eastern boundary) and there is existing infrastructure on the farm which can be utilized to service the proposed agricultural development. Farm 653 is located ~2km south of the "Valley", which is renowned for its citrus cultivation, other intensive agricultural practices and associated supporting industries (packhouses, co-op and juicing facilities). It is proposed that the proposed agricultural development on Farm 653 is supported by the existing packing and processing facilities available in the "Valley" and in close proximity to the farm under assessment.

As per the outcomes of the Rapid Environmental Risk Assessment, some of the elements contributing to the sustainability of the agricultural potential of the site is access to land, suitable soils, topography of the site and availability of water. Based on the experience of the independent environmental assessment practitioner in the area, access to such land in the Sundays River Valley, which meet the abovementioned requirements, is becoming increasingly scarce. The reason being that, suitable land with sufficient access to water is already being utilized for commercial citrus production. This is leading to the expansion of intensive agriculture towards the fringe of the historically developed portions of the "Valley".

The proposed agricultural development on the Farm will create several temporary construction phase, as well as permanent, operational and seasonal employment opportunities. In addition to the direct employment opportunities related to the farming operations, a number of indirect jobs will also be created by the proposed development, particularly within the packaging and logistics industries, and the further processing (juicing) industries, amongst others. Based on market conditions, Ikamva Lethu Farms (Pty) Ltd intends to send a large portion of the fruit produced on Farm 653 to a local juicing factory and the remainder will be sent to existing packhouses in the Sundays River Valley, which are owned and operated by the SRCC, for the preparation of the product for fresh export or sale at local markets. The fruit produced on site will, therefore, be sold as processed (juiced) and fresh fruit to local and international markets, dependent on market demand. The proposed agricultural development will thus generate income from foreign currency, thereby contributing to local economic growth, as well as assist in stimulating local markets. In addition, given that this agricultural development is an empowerment project there will be additional benefits to be realized for beneficiaries associated with the project, which is required be maintained at a minimum of 59% in terms of the water use license.

For the reasons outlined above **this is the preferred alternative**, which has been assessed in detail during the EIA phase of the assessment, and which includes preferred layout/ development footprint alternatives within the preferred site. Chapter Four of this report provides an overview of the methodology for the identification, rating and assessment of impacts (both positive and negative) and the specialist studies undertaken during the EIA phase of the assessment.

#### 14.8.4 Layout Alternatives

The EIA phase of the assessment has assessed layout/ development footprint alternatives on Farm 653, based on detailed specialist studies, technical input, as well as public consultation. Specialist studies which formed part of this assessment are:

- Soil Suitability – potential of soils for the establishment of citrus orchards
- Slope Analysis – slopes in excess of 25% are not suitable
- Vegetation – species of special concern, ecological corridors, conservation targets
- Aquatic – aquatic sensitivity and associated buffer zones
- Irrigation efficiency and requirements – drip and pivot irrigation
- Heritage – heritage features on site
- Traffic – access and egress from the site on the MR00470 road (Sunland Road)
- Visual – impact on sensitive receptors in the immediate landscape
- Roads and Wet Services – recommendations regarding domestic water, effluent management, and stormwater management for the logistical services area
- Security Risk – potential elevated security risk posed by the proposed development on rhino and exotic game in the area

The final layout (preferred development footprint within the site) for the project has been determined by the specialists and technical input in the EIA phase of the assessment, as well as public consultation and proposes to clear ~650ha of indigenous vegetation for the establishment of ~586ha of citrus orchards, as well as the installation of associated infrastructure (~64ha) on Farm 653 (See Chapter Two).

The preferred Alternative Layout includes changes to the initially proposed configuration of the orchard layout, in particular to accommodate a minimum 300m no-go biodiversity buffer from the northern and north western boundaries of the property, in order to accommodate the recommendations of the various specialist studies (Vegetation, Aquatic, Soil Suitability and Security Risk Assessment). In addition, portions of the farm which are considered to steep (>25% slope) to plant citrus, have been excluded. The preferred layout also indicates the recommendation by the Traffic Specialist to re-align the primary access point and the associated changes to the access road.

#### 14.8.5 Irrigation Infrastructure Alternatives

The preferred irrigation infrastructure alternative is based on technical input from the irrigation specialist, as well as from the project applicant. This alternative, through consultation with the relevant parties, was considered to be the most financially viable option. The following irrigation infrastructure components are associated with this preferred alternative:

- Irrigation water for the development will be provided from the Lower Sundays River Water Users Association (LSRWUA) canal system and will be reticulated from the canal offtake point located on the Remainder of Farm 714, to Farm 653, via **two** uPVC pipes (ø450mm; throughput 280 L/s) for a distance of ~578m.
- The two pipelines converge into a single uPVC pipe (ø630mm; throughput 280 L/s), for a distance of ~137m across the Sundays River.
- Following the crossing, the reticulation again splits into two uPVC pipelines (ø450mm; throughput 280 L/s) for a distance of ~7km, where it terminates at one of the proposed new dams on Farm 653.
- The pipeline to be installed within the road reserve and over private land for a distance of ~8km's. The following properties will be affected by the proposed pipeline route:
  - Remainder of Farm 714;
  - Portion 3 of Farm 558;

- Portion 39 of Farm 558;
- Portion 6 of Farm 558; and
- The proposed pipeline route is also required to be installed in the reserve of a proclaimed public road (MR00470).

For more detail regarding the alternatives that were not considered further in the assessment process due to them not being preferred, see Chapter Five of this report. For more detail on the preferred alternative assessed in detail in this assessment process, see Chapter Two of this report.

#### 14.9 PERMIT REQUIREMENTS

Permission will be required from the provincial environmental authorities for the clearance of vegetation and removal of plant species protected by the relevant legislation.

- Permits from the relevant authority (Department of Economic Development Environmental Affairs and Tourism) are required for the removal, translocation or destruction of all plants and animals listed as endangered or protected in terms of the Cape Nature and Provincial Conservation Ordinance (No. 19 of 1974), as well as those listed as Threatened or Protected Species in terms of NEMBA.
- The Department of Water and Sanitation (DWS) will be required to provide feedback on the requirement for a water use licence application in terms of Section 21 (c) and (i) of the National Water Act.
- The Traffic Impact Assessment is to be submitted to the Eastern Cape Department of Roads and Public Works of the Eastern Cape for approval prior to commencement of the construction phase.

#### 14.10 OVERALL EVALUATION OF IMPACTS

The Final Integrated Development Plan for the SRVM (SRVM IDP 2015/ 2016), indicates that the current unemployment rate in the municipal area may be as high as 38.54%. The Agricultural sector provides room for growth in terms of employment opportunities, as it currently represents approximately 11% of the employment for the SRVM area. Additionally, the SRVM IDP (2015/ 2016; Page 36) states that: *“The municipality can boast its ecotourism and agricultural potential.”* Finally, the following statement is given by the SRVM Spatial Development Framework (SRVM SDF 2013; Page 8): *“The agricultural sector is one of the key economic drivers of the Sundays River Valley Municipality.”*

It is the applicant’s intention to build on this economic base in the SRVM, by making optimum use of the available resources the area has to offer, i.e. the availability of a sustainable supply of irrigation water from the LSRWUA canal system, the suitability/ fertility of the soils on Farm 653, as well as the available work force from local communities. By making use of this labour market, the proposed development would also support the vision of the Sundays River Valley Local Economic Strategy, as outlined in the SRVM SDF (2013), which indicates agriculture as a Local Economic Development Priority and identifies the need to *“...expand the agricultural section in the region.”*, as an Economic Development Objective.

Ikamva Lethu Farms (Pty) Ltd is a BEE citrus farming business initiated by the Sundays River Citrus Company (SRCC). The establishment of Ikamva Lethu Farms (Pty) Ltd has been guided by the National Development Plan (NDP) pertaining to land reform, empowerment and transformation within the agricultural industry. The objective being to transfer farming enterprises to farm workers, while the farmer or landowner retains ownership of half of the shares.

Having launched a transformation strategy in 2006, SRCC has three existing empowerment farming enterprises, excluding Ikamva Lethu, which are owned by workers' trusts – Luthando Farm, Mbuyiselo Farm and the Sundays River Farming Trust. Luthando Farm, which is 75% owned by the workers' trust and 25% owned by SRCC, has a total export production exceeding 200,000 citrus cartons per year. Mbuyiselo Farm, which is wholly owned by a workers' trust, has a total export production exceeding 75,000 citrus cartons per year. Finally, the Sundays River Farming Trust, which consists of five consolidated farms – the land of which is still mostly owned by the government – has a current total export production of about 450,000 citrus cartons per year.

It is estimated the capital investment of the development, upon completion of the construction phase, will be ~R225 million. It is estimated that the construction phase of the development will create ~66 new employment opportunities at a value of ~R21.4 million (over a five-year period).

Upon completion of construction and during the operational phase of the development, it is estimated that ~62 permanent employment opportunities will be created at a value of ~R2.2 million annually, and ~566 seasonal opportunities at an annual value of ~R6.8 million. Labour will be sourced locally from communities in the SRVM and Nelson Mandela Bay Municipality (NMBM). In addition to the direct employment opportunities that are created as part of the farming operations, a number of indirect jobs will also be created by the proposed development particularly within the packaging and logistics industries, as well as the processing (juicing) industry amongst others.

Based on the outcome of the detailed specialist assessments, technical input and consultation process, it is proposed that ~650ha (56%) of vegetation on Farm 653 be cleared in order to facilitate the establishment of ~586ha of citrus orchards and ~64ha of associated infrastructure.

The additional clearance of ~650ha will result in ~**43.5%** of the vegetation on Farm 653 being retained. By adopting the proposed no-go areas and all mitigation measures recommended by the Ecological Specialists, the biodiversity pattern target area for the various vegetation types, and the hydrological/ ecological process areas associated with aquatic features, will be safeguarded. In addition, these final no-go areas exceed the targets delimited on the SRV CBA Map and can be interpreted as a **positive outcome in terms of preserving biodiversity on Farm 653**. In addition, the sensitive vegetation type, Bontveld has been excluded from the development footprint, thus preserving the habitat of several rare, threatened and endemic species which could potentially occur on site.

By applying the mitigatory measures proposed *Construction Phase* direct and indirect impacts of medium to high significance can mostly be reduced to impacts of *medium to low negative or neutral impacts*. The key direct and indirect impacts associated with the *Operational Phase* of the development can, by applying the mitigatory measures proposed is reduced from negative impacts of high to medium significance to *impacts of medium to low significance*.

The Environmental Assessment process has not identified any negative impacts that should be considered "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. Taking into consideration the findings of the EIA process, it is the opinion of the Environmental Assessment Practitioner that the project benefits outweigh the negative residual environmental impacts, provided that the specified mitigation measures are applied effectively, it is proposed that the project receive environmental authorization in terms of the EIA process.