

November 2017

*MDARDLEA Ref:
1/3/1/16/1 E - 108*

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

BOBLANDS - AVOCADOS

PUBLIC REVIEW



**ENPACT ENVIRONMENTAL
CONSULTANTS CC**

REG. 2004/051532/23

I. PROJECT INFORMATION

PROJECT DETAILS	
TITLE	Boblands Avocados
REPORT STATUS:	Environmental Impact Report – public review
LOCATION:	A Portion of Portion 1 of the farm Boblands 247 JU and Portion 3 of the farm Weltevreden 229 JU, Mara Valley, Mpumalanga.
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REPORT PREPARED FOR SUBMISSION TO:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs: DARDLEA Ehlanzeni District Offices The Directorate: Environmental Impact Management 18 Jones Street Nelspruit, 1200
DATE OF COMPILATION:	November 2017
ACTIVITIES APPLIED FOR:	Notice no. R 983, 2014: Activity 27. Notice no. R 984, 2014: Activity 15.
MDARDLEA REFERENCE NUMBER:	1/3/1/16/1 E – 108

EAP Declaration

I hereby affirm/confirm:

- The correctness of the information provided in the report;
- I will ensure compliance with the EIA Regulations 2014 as amended;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application;
- I will take into account, to the extent possible, the matters listed in regulation **18** of the regulations when preparing the application and any report, plan or document relating to the application;
- I will disclose to the proponent or applicant, registered interested and affected parties and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority or the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority (unless access to that information is protected by law, in which case I will indicate that such protected information exists and is only provided to the competent authority);
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I am aware that it is an offence in terms of Regulation 48 to provide incorrect or misleading information and that a person convicted of such an offence is liable to the penalties as contemplated in section 49B(2) of the National Environmental Management Act, 1998 (Act 107 of 1998).



Signature of the environmental assessment practitioner

02/11/2017

Date

EXECUTIVE SUMMARY

Submitted to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) in terms of the requirements of Government Notices no. R982 – R984 for the Scoping and Environmental Impact Assessment (EIA) process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

Application Summary

Project: Boblands Avocados

Location: A Portion of Portion 1 of the farm Boblands 247 JU and Portion 3 of the farm Weltevreden 229 JU, Mara Valley, Mpumalanga. The farm is located south-east of Nelspruit in the Mara valley, south of the N4 Nelspruit-Malalane highway and approximately 11km into the valley from the N4 Mara turn-off.

Activities:

EIA regulations 2014 (amended), published in the Government Notice No. R982, R983 and R984 under Section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998):

Listed activity:	Project description:
Description of the relevant Basic Assessment Activities as per Listing Notice 1 (GN No. R983)	
R.983, 2014: Activity 27 - The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	It is proposed to clear three sections of indigenous vegetation for the purposes of cultivation at S25° 35' 25.09" E31° 8'30.52"
Description of the relevant Scoping and EIA Activities as per Listing Notice 2 (GN No. R984)	
R.984, 2014: Activity 15 - The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	It is proposed to clear an area of 29,5 hectares of indigenous vegetation for the purposes of cultivation at S25° 35' 25.09" E31° 8'30.52"

Proposed activities:

It is proposed to clear three areas of approximately 29,5 hectares of indigenous vegetation for the purposes of avocado cultivation. The three sites are located west (site 1) and east (site 2 and site 3) of the main gravel road to the Paradors Game Ranch.

Two of the three areas were cultivated more than ten years ago and the re-established vegetation is now classified as indigenous.

Irrigation water will be released from a dam, on the applicant's property further south and located on Paradors Game Ranch, in one of the main tributaries of the Blinkwaterspruit. The applicant has irrigation rights out of this water course and the dam.

The required water will be released down the Blinkwaterspruit to the cultivation sites. Both the spruit and tributary only have streamflow during the rainy season.

The regulations require that where an area of a certain size is to be cleared of indigenous vegetation, an environmental authorisation is required. 'Indigenous vegetation' is defined as vegetation that consists of indigenous species occurring naturally in the area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.

Refer to the layout maps under Appendix 1.

Process followed:

An application with relevant documentation was submitted to the MDARDLEA on 13 July 2017. A reference number was allocated by the Department (Ref: 1/3/1/16/1 E - 108).

The Scoping Report and Plan of Study was made available for comment in line with the 2014 EIA regulations as amended and submitted to the MDARDLEA. Approval of this report was obtained on 22 August 2017 and marked the end of the Scoping phase.

A public participation process in terms of Regulation 41 of the GN 982, 2014 Regulations (amended) was and will be followed throughout the process. A notice was placed in the Lowvelder of 11 July 2017 to inform potential interested parties of the process and the availability of the Scoping Report for comment. All adjacent landowners, the conservancy and the relevant state departments were provided with the opportunity to comment on the report and application.

A site notice was placed at the site along the main gravel road that traverses the area on 11 July 2017.

The comments received from an I&AP, the MDARDLEA and MTPA during the Scoping phase is recorded in an Issues and Response report.

The Environmental Impact Assessment Report (EIR) was compiled and is available for a 30 day commenting period after the scoping report approval.

Specialist work was done to determine the feasibility of the areas to be included in the application and the results are included in this report.

Direct consultation will take place as was done to date. The report and EMPr that will be submitted to the CA for consideration will include any further issues raised by the commenting parties and the results of consultation during this time.

Key findings and recommendations:

Alternatives:

Clearing of indigenous vegetation:

The applicant took into account the most suitable areas on this property that was previously cultivated and that would be suitable for the cultivation. The size of these areas was determined by the water availability and soil suitability and definitely the present ecological state.

The environmental aspects of the three areas were investigated. The ecological features of the sites were assessed and an impact assessment done. A soil and agricultural specialist

also assessed the site and made certain recommendations. More detail follows later in the report.

The sites as indicated on the attached site map and described in the report is suitable for the proposed activity of removing indigenous vegetation without it having potentially high significant impacts on the receiving environment.

The more sensitive riparian zones close to the sites were also taken into consideration. The ecologist took into account a number of factors in the assessment with proposing the areas that would be suitable whilst providing for appropriate buffers. The location of all three sites is already a significant mitigation measure and to a degree this determines the expected significance of the rest of the impacts that were assessed.

A total area of 29.5 ha can be included in the application for the authorisation of the removal of indigenous vegetation. Provision is also made for appropriate buffers.

“No-go” Alternative for cultivation:

The “no-go” alternatives would entail that the areas that was investigated and included in the application is not cleared for cultivation for avocados or any other crops. This is not the preferred option for the applicant.

Despite the site being located in a conservancy it is not within a protected area and it would not be an environmental fatal flaw should the application be considered favorably.

Key potential impacts:

Cultivation impacts:

All the sites that were identified by the applicant are suitable for the cultivation of the planned avocado orchards and could also be suitable for macadamias. The terrestrial and aquatic ecology, the soil characteristics and water requirements and availability was considered and the potential impacts assessed.

It is proposed to clear indigenous vegetation on an area of 29,5 ha located on Site 1, 2 and Site 3. These areas exclude the sensitive drainage lines with associated riparian habitat. The necessary mitigation measures were proposed for the identified impacts.

The following impacts were assessed:

- **Surface water and aquatic ecology:**

The applicant has an irrigation dam upstream of the sites to be cultivated. The dam was built in 1958 and registered for abstraction. The confirmed storage capacity is 124 644m³ with an abstraction of ±90 000m³/annum.

The applicant has verified abstraction rights on his property for 306 261 m³ per annum for the irrigation of 59.7 ha. IUCMA confirmed and verified the capacity. Refer to the attached document under Appendix 5.

A total of 4286 trees will be planted on the planned 30 ha. The total water requirements are 188 584m³ per year.

The applicant has enough water to successfully cultivate the site and the mitigated impact in terms of demand is of a low significance. The proper planning of the layout of the orchard and irrigation system is however important.

There are two drainage features associated with the sites that were investigated for cultivation.

The riparian habitat along the Blinkwaterspruit (west of the sites) provides refuge and a corridor for fauna as well as important morphological functions. This primary riparian zone has very important stabilising and ecological functions and has a Medium - High sensitivity rating.

The proposed clearing activities could result in the degradation of the habitats associated with the surface water resources. The removal of vegetation, specifically indigenous vegetation, will open up disturbed soil surfaces to the invasion of alien invader plants which could extend into the riparian areas and drainage lines if not managed. Hardened and unprotected soil surfaces close to water resources may result in an increase in storm water run-off from the sites which could potentially cause erosion, the loss of top soil, sedimentation, damage to aquatic habitat as well as surface water pollution.

The sites to be cleared are however all located outside of the riparian zones that were identified and described in the ecology report. In addition a buffer zone is proposed that would be adequate to conserve the riparian habitat. This will minimise potential impacts. There is enough space between the proposed edge of the lands and the buffer line for a service road.

The potential impacts are rated to be of medium to high significance before mitigation.

- **Geology and soil:**

The physical removal of indigenous vegetation is not going to change the geology or soil conditions of the sites but the suitability of the soil for planting will determine the potential impacts during operation as well as the success of the crops.

The irrigation planning and the layout of the units to be cleared and how it is done will impact on the soils of the site which in turn may have impacts on the surface water resources. An irrigation strategy must be planned and scheduling is essential as pointed out by the agriculturist.

The activities will result in unprotected and disturbed soil surfaces which may be prone to soil pollution and erosion. The activities may result in the irreplaceable loss of topsoil but it can however be prevented and managed.

The Land Suitability Evaluation states that: 'It is the opinion of the writer that should the specified precautions been taken and the current management practices being upheld; and professional irrigation planning is done, according to homogeneous soil typing, the Weltevreden would be suitable for the proposed avocado extension.'

Impacts are of medium significance before mitigation which is possible and feasible and will minimise or prevent the potential impacts.

- **Terrestrial ecology:**

Site 1 and Site 2 is fallow land. Site 3 has not been cultivated in the past.

The biodiversity assessment concludes the following as abstracted from the report: 'Site 1 & 2: Large trees are limited to secondary growth *Acacia karroo* individuals (pioneers) and large solitary specimens of Marula (*Sclerocarya birrea*) and the wild fig (*Ficus sycomorus*). The large specimens of the last two mentioned species are remnants of the original natural vegetation. Marula trees are also well represented in the surrounding natural woodland and it will not have a significant ecological impact if these trees are removed. However, it is recommended that the large *Ficus sycomorus* specimen on site 2 is conserved as it is of ecological importance as a source of food to many species of animals.'

No Red Data Listed fauna or vegetation was recorded and the biodiversity importance and ecological functions of these sites are Low.

Site 3: Species diversity in this community can be considered to be medium-high and the ecological functions in this habitat will be of local importance. The ecological importance and sensitivity are therefore rated as High. It is a relatively small portion of woodland that will be lost (10.5Ha).

The proposed activity located on site 3 will result in a loss of natural indigenous vegetation and natural habitat. This activity will be highly significant on site level but as this habitat type is well represented locally and regionally it can be reasoned that this impact will be of medium significance locally and medium-low significance regionally.'

The sites to be cleared are however all located outside of the riparian zones that were identified and described in the ecology report. In addition a buffer zone is proposed that would be adequate to conserve the riparian habitat. This will minimise potential impacts.

Potential impacts include habitat loss, alien plant invasion, loss of on-site biodiversity.

A large amount of the natural vegetation that will be lost actually constitutes bush encroachment and the loss of these areas will not be of high significance.

Other impacts that were also addressed:

- Air quality;
- Aesthetic impact;
- Traffic
- Noise and
- Socio-economic impacts

Conclusion summary:

No environmental fatal flaws were identified with the proposed clearance of the 29.5 hectares of indigenous vegetation. The clearance for the purposes of cultivation will not result in the complete transformation of any of the vegetation communities identified in the surrounding area.

It is proposed that the clearing is considered and authorised for the indicated sections.

Project Team

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Heinrich Kammeyer is the owner of Enpact Environmental Consultants CC. Qualifications include a degree in Chemical Engineering, MBL and a Masters Environmental Engineering. The Environmental Consulting Business which was started in 2004 has completed more than 150 Environmental Impact Assessment Applications to date. Experience in Environmental Impact Assessments, over the past 13 years, spans a wide range including residential and business developments, tourism developments, roads, water and sewer, renewable power generation, concentrate farming and waste management facilities. In addition he also has extensive experience in waste management licences as well as water use licence applications.

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***** For the Terms of References, methodologies and Specialist Declarations please refer to the attached Specialist reports**

Boblands Avocados

1. Introduction and Motivation

1.1 Background

Enpact Environmental Consultants CC was appointed to conduct the environmental impact assessment process in order for the applicant to apply for environmental authorisation to clear indigenous vegetation on an area of which the size meets the thresholds as listed in the EIA Regulations, 2014 as amended.

Two of the sites proposed for clearance have been cultivated in earlier years and can be classified mostly as secondary indigenous vegetation. The other site comprises natural woodland.

This application follows after an initial proposal from the applicant to cultivate the 30 ha area with macadamias on the farm Paradors Game Ranch. As a result of the public participation process the applicant reconsidered his planning and decided to rather opt for a lower impact activity such as pasture planting.

The applicant still would like to farm commercially and therefore this application following the outcome of the previous application.

This Environmental Impact Assessment Report was compiled in terms of the National Environmental Act, 1998 and Environmental Impact Assessment Regulations, 2014. The environmental impact assessment evaluates the aspects and potential impacts of the proposed development on the natural and social environment. Information for the evaluation was obtained from the applicant, professional team, environmental specialists and the interested and affected parties.

The Environmental Impact Assessment Report contains the following information:

- Detail description of the proposed activity;
- Description of the property on which the activity is to be undertaken;
- Description of the process undertaken to reach the proposed development footprint within the site;
- Description of the environment that may be affected by the activity;
- Details of the public participation process;
- The need and desirability of the proposed activity;
- Evaluation of alternatives;
- Specialist reports and findings;
- Description of environmental issues that were identified;
- Assessment of environmental issues;
- Environmental impact statement with key findings of the environmental impact assessment;
- Environmental Management Programme.

The Environmental Impact Assessment Report is first made available for comment to Interested and Affected Parties which includes State Departments and relevant authorities. The report will then be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) for consideration in order to reach a decision on the application.

1.2 Description of activity

It is proposed to clear three areas of 29,5 hectares in total for the purposes of avocado cultivation.

Site 1 (5.8 ha), Site 2 (13.2 ha) and Site 3 (10.5 ha) is located adjacent east to the Blinkwaterspruit. Refer to Figure 1 and the attached locality map.

The regulations require that where an area of larger than 1 hectare is to be cleared of indigenous vegetation, environmental authorisation must first be obtained.

Indigenous vegetation is defined as vegetation that consists of indigenous species occurring naturally in the area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.

Two of the three areas were cultivated more than ten years ago and the re-established vegetation is now classified as indigenous. The footprint of earlier activities is still evident and the boundaries up to where cultivation took place are easy to determine.



Figure 1: Areas proposed to be transformed

Irrigation water will be released from a dam located in one of the main tributaries of the Blinkwaterspruit on Paradors Game Ranch which is the applicant's property that is located

further south of the proposed sites. Water will be released down the Blinkwaterspruit to where it will be abstracted from the existing dam adjacent south of the sites. Refer to figure 2 below.

Each site will be described and discussed separately in the EIR. A specialist assessed the terrestrial ecology of the site to determine the present ecological state of the area.

The gravel road providing access to Paradors Game Ranch and other farms in the area from the Mara turn-off on the N4 highway also provides access to the proposed sites. One site is located adjacent west of the gravel road and the other two adjacent east of the road. There are some internal roads on the sites that will be used for the operation and management purposes of the planned orchards.

In preparation for the planting of the avocado trees, the natural tree cover, other woody vegetation and grass cover will be removed from the sites. The lines in which the trees are to be planted will be deep ripped and berms will be created. The trees will be planted on top of the berms and the required irrigation system will be put in place. The applicant will use micro irrigation.

Any contours still on the site will stay in place to curb erosion but the trees will be planted in a north-south direction. Ground cover will be spread into the areas between the tree lines to encourage growth and to protect the soil.

The sites will be fenced appropriately to protect the crops. A maintenance road will also be allowed for next to and on the outside of the fence line.

2. Need and desirability of the activity

2.1 Need and Desirability

The property is zoned for agriculture and a large section of the proposed sites have been farmed and cultivated in the past. The impact of years of cultivation on some areas despite it being fallow for more 10 years is still evident.

The vegetation to be removed is mostly secondary indigenous vegetation but the areas are not pristine despite Site 3 comprising of natural woodland.

Avocado is a universally popular fruit and there is great opportunity in this market. The applicant initially investigated and planned on entering the macadamia market but after further investigation and consideration decided on avocados.

There is an upward trend in avocado exports to the European market driven by consumer demand (<https://www.cbi.eu/market-information/fresh-fruit-vegetables/avocado/europe/> (October 2017)).

There was a high rise in the avocado prices over the past year to a record high. According to business live and the CEO of the SA Avocado Growers' Association, South Africa exports about 55,000t/year, of which 95% goes to Europe and the UK. The Association are focusing on France, Germany and the UK through a joint marketing initiative with Peruvian growers. And China is also driving demand. According to the MD of a well-known estate, the expansion of the industry would likely be more aggressive if not for constraints in the supply of new trees from nurseries (<https://www.businesslive.co.za/fm/fm-fox/2017-07-27-why-avo-prices-have-soared-150/> (October 2017)).

The applicant endeavoured to cultivate some sites on Paradors Game Ranch but due to the outcome of consultation during the public participation process for the EIA that was done for that property, the applicant decided to rethink his approach and it did not realise. The applicant however identified the opportunity to still farm commercially and enter this market and is now in the process of acquiring the property under application.

The farming activities will also generate income that will assist in maintaining the Paradors Game Ranch.

As confirmed in the Land Suitability Evaluation: 'The owner of the farm, Mr. Jan Nel, is an experienced and qualified agricultural economist, is farming successfully for the past 35 years on very similar soils, previously with citrus, bananas, mangos, vegetables and macadamia. He has the service of a well-trained and loyal workforce and a very competent management team. His financial success, based on excellent management and cultivation practices, are clearly visible for all to see. There should be no financial restraint to comply with the land improvement recommendations that will ensure sustainable cultivation and prevent environmental degradation.'

The proposed land use on the sites to be cleared will not compromise the integrity of the regional, municipal or environmental spatial framework plans. It will not compromise the integrity of the conservancy or the importance of the Mara Valley as an ecological corridor. The sites are outside the boundaries of the nearby private game reserve.

Site investigation was done to describe the present ecological state of the proposed areas and identify areas that would not be suitable for vegetation clearance. Riparian areas were identified, described and proposed for protection and exclusion from the footprint. The detail of the terrestrial study is included in the following sections of the report.

The sites are easily accessible and there is an existing access road to the areas as well as internal farm roads.

Please refer to Sections 3, 4, 8 and 9 of the report where more aspects pertaining to the need and desirability is further discussed. Specifically refer to the impact assessment.

2.2 Benefit to society

Benefits to the society in general as a result of this activity are limited. The applicant will mostly benefit personally/financially from the planting of avocados.

The activities will create some job opportunities. This could benefit people from the local rural community and impact on the associated agricultural sector (suppliers and services deliverers – fertilisers, irrigation, equipment and expertise).

According to the report: Land suitability evaluation of block Weltevreden Avo's (30 Ha) by Mr Marx, October 2017, the proposed development is moderate and would amount to the creation of 1 managerial, 12 permanent labourers (1 labourer / 2, 5 ha) and an additional 30 seasonal labourers, from April to August every year, at 1 labourer / ha. Refer to Appendix 4.

If the sites are farmed successfully and efficiently it could benefit the society in that it would contribute to the local well-being and growth of the farming sector. The applicant also

indicated that the cultivation could fund some of the conservation activities on the farm which contributes to the success of the conservancy.

3. Site Specifications

3.1 Locality of proposed activity

The proposed activities will take place on a Portion of Portion 1 of the farm Boblands 247 JU and Portion 3 of the farm Weltevreden 229 JU, Mara Valley, Mpumalanga.

The property is located south-east of Nelspruit and lies south of the Nelspruit-KaNyamazane N4 highway. Travelling with a 11km gravel road from the Mara turn-off the farm is located in the Mara valley.

3.2 Local authority

The development area falls under the jurisdiction of the City of Mbombela local municipality.

3.3 Land use zoning

The land is zoned for agriculture and rezoning is not required.

The farm falls outside the boundaries of the Paranie Private Nature Reserve.

3.4 Existing land use

All three sites are currently not cultivated. Two of the sites for which the clearing of vegetation requires environmental authorisation are covered mostly with secondary natural vegetation and a few trees that were preserved. Site 3 consists of natural woodland vegetation.

Site 1 includes only a section of a larger area that was farmed/cultivated in the past.

There are no streams or wetlands on the sites. The Blinkwaterspruit and a tributary falls adjacent but outside the area proposed for cultivation. There are small farm roads on some sections.

3.5 Surrounding land use

The area directly south of Site 1 has been cultivated the most recently but is not currently actively farmed.

The Blinkwaterspruit is directly adjacent west to Site 1. A tributary of the Spruit is located adjacent to the northern boundaries of Site 1 and Site 2. The area immediately surrounding these sites is also not cultivated and will likely remain natural.

The dwellings on the adjacent farms are situated between 0,4km to 1km from the proposed sites.

On a broader scale the application sites fall in the Crocodile Valley Conservancy and it is a mountainous area of which most of the surrounds are natural.

The sites fall outside of the boundaries of the Paranie Private Nature Reserve that is located further to the south.

The Paradors Game Ranch, located south of the proposed sites is owned by the applicant and mostly undeveloped with only the guest lodge and entertaining facilities as well as outbuildings and the farm houses on the property. The farm is home to a number of game species including buffalo. In the winter months hunting takes place on the farm.

The neighbouring farms are also mostly natural due to the mountainous terrain. Agriculture is however taking place in the surrounding valley on some of the more suitable areas.

The prominent land uses within 1 km from the site:

Natural area	Low density residential	Medium density residential	High density residential	Informal residential
Retail	Commercial & warehousing	Light industrial	Medium industrial	Heavy industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facilities
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes or more)	Airport
Harbour	Sport facilities	Golf course	Polo fields	Filling station
Landfill or waste treatment site	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archaeological site
Other land uses (describe):				

4. Site Assessment – Physical Characteristics

4.1 Climate

The area has a sub-tropical climate and is located in the Lowveld.

According to the ITSG Nelspruit weather office the *effective* rainfall is 400mm per annum. This was taken into account by the irrigation consultant in terms of determining the water requirements of the orchards to be planted.

The site is located in a summer rainfall zone with seasonal summer-rainfall, warm temperatures and dry winters. Frost is infrequent. The highest rainfall and daily temperatures are between October and March. The winters are dry and cooler.

The area is located in the Lowveld with a typical sub-tropical climate. The summers are very hot and humid. The winters are dry and cooler. Summer temperatures rise as high as an average of 36°C whilst winter temperatures can average between 0.8° C night-time to 23° C daytime temperatures.

4.2 Topography

The Mara Valley in which the sites are located is a mountainous area. The three sites all slope in a westerly and northerly direction towards the Blinkwaterspruit and the tributary north of the sites.

4.3 Geology and soil conditions

Mr W Marx is an agriculturist with soil expertise and he investigated the site and compiled a Land Suitability Evaluation Report, October 2017 which specifically considered the soil suitability.

The following information is summarised from the report:

The proposed new development will slot in with the current operations on nearby farms, expertise and management.

Soils are formed mainly as result of weathering but the soil character is influenced by number of factors, the most important being the parent material, climate, topography, drainage, erosion and living organisms. For this reason soil identification is a complex exercise. An integrated approach using the parent material, binomial and taxonomic classification was used.

Soil data collection:

Existing archive data available for the preliminary evaluation was obtained from the Department of Agriculture (1:250000 scale land type maps), supplemented with geological- (1:250,000) and topo cadastral (1:50,000) maps, studies by the South African Sugar Association, AGIS maps and aerial photographs of the area.

The farm was plotted and the area to be developed located. The area was identified as mainly humid Lowveld on Swaziland Basic Rock. The average height above sea level is 750meters and the average rainfall is between 600-800mm per annum (based on 20 year farm records).

Agis maps and Aerial photographs (for topographic, vegetative and soil characteristics) were used to determine the major soil characteristics.

The major soil forms for the area were identified as Oakleaf, Hutton, Shortlands and Bainsvlei.

Percentage of site made up by the different soil types:

- Oakleaf (35%)
- Hutton (40%)
- Shortlands (7%)
- Bainsvlei (18%)

(1) Hutton (Oxidic soil):

Parent material: Granite/Swazi basic rocks.

Soil system: humid Lowveld

Profile description: Ortlic A (dark reddish brown loamy sand to clay) and red apedal B (reddish-brown loamy sand - non blocky clay).

Topsoil texture	Effective rooting depth(mm)	Clay %	Drainage	Erosion hazard	ph	Base status	Organic matter content	Salinity/sodicity hazard
Sandy loam	500 - 700	16	good	Low - moderate	6,68	moderate	moderate	low

2) Bainsvlei (Plinthic soil) :

Parent material: Basalt

Soil system: Lowveld

Profile description: Ortic A (Dark grey-brown sandyloam), B horizon (Reddish brown porous non blocky clay medium deep grey-brown sand/sandy loam on a reddish-brown porous non blocky clay).

Topsoil texture	Effective rooting depth(mm)	Clay %	Drainage	Erosion hazard	ph	Base status	Organic matter content	Salinity/ sodicity hazard
Sa Lm	600-800	22	Moderate to good	Moderate	6.5	High	moderate	Moderate

(3) Oakleaf (Cumulic soil):

Parent material: Alluvium

Soil system: dry Lowveld/ river valley

Profile description: Ortic A (Dark sand to sandy clay loam) B horizon: weakly structured red sandy loam)

Topsoil texture	Effective rooting depth(mm)	Clay %	Drainage	Erosion hazard	ph	Base status	Organic matter content	Salinity/ sodicity hazard
S Lm	800>	19	Good	moderate	6.2	Low - moderate	moderate	Moderate - high

(4) Shortlands (Oxidic soil):

Parent material: Swazi basic rock

Soil system: Humic lowveld

Profile description: Ortic A (Dark reddish brown clay loam) B horizon: (Reddish brown blocky clay)

Topsoil texture	Effective rooting depth(mm)	Clay %	Drainage	Erosion hazard	ph	Base status	Organic matter content	Salinity/ sodicity hazard
S Lm	900>	35	Good	Very low	6.2	moderate	high	Low

Land suitability evaluation

The land suitability classification was done according to the FAO guidelines for irrigated agriculture.

Criteria	Soil			
	Hutton	Bainsvlei	Oakleaf	Shortlands
Permeability	S1	S1	S1	S2
Wetness	S2	S2	S2	S3
Rockiness	S1	S1	S1	S1

Salinity/Alkalinity	S2	S2	S2	S2
Soil toxicity	S1	S1	S1	S1
Workability	S3	S3	S3	S2
Resistance to erosion	S3	S2	S2	S1
Flooding hazard	S1	S1	S2	S2
Oxygen available at roots	S2	S2	S2	S3
% land slope	S3	S3	S3	S3
AWC (mm/m)	S2	S2	S2	S1
ERD (mm)	S2	S2	S2	S2
TAW (mm)	S2	S2	S2	S2
Temperature	S1	S1	S1	S2
Photoperiod and radiation	S1	S1	S1	S1
Climatic hazards	S2	S2	S2	S2
Air humidity	S1	S1	S1	S1

AWC = Available water capacity

ERD = Effective rooting depth.

TAW = Total available water.

Class 1: high potential, very few limitations, fairly easy to manage and conserve.

Class 2: high potential, very few limitations, fairly easy to manage and conserve.

Class 3: medium potential, fairly serious limitations, needs careful management.

Class 4: limiting, needs very good conservation practices and special management.

Recommendations to improve the soil should farming be considered are included in the impact assessment. Refer to the report for more detail on the classification of the soils.

4.4 Terrestrial ecology

A terrestrial vegetation assessment was conducted to determine the present ecological status of the sites and determine the potential impacts. An Ecological Assessment: The proposed clearing of indigenous vegetation on Ptn 1 Boblands 247JU and Ptn 3, Weltevreden 229JU, City of Mbombela Local Municipality, March 2017 was conducted by Afrika Enviro & Biology. Following is a summary and abstracts from the report. Refer to Appendix 3.

4.4.1 Terrestrial flora

All the sites are located on the eastern valley slope the Blinkwaterspruit. Terrestrial habitat varies from natural woodland and riparian areas to old agricultural lands (old agri-lands). No wetlands or rocky outcrops are present on the proposed sites.

The site is classified as Malelane Mountain Bushveld (SVI11); (Mucina & Rutherford, 2006). This veld type is rated as Least threatened as it is well protected (45% formally protected in the Kruger National Park and Mthethomusha Provincial Nature Reserve). Approximately 4% is transformed due to agriculture, urban sprawl and roads infrastructure.

The terrestrial importance and fresh water ecology of the project area (all three sites) is classified as heavily and moderately modified old lands in terms of the Mpumalanga Biodiversity Sector Plan (Lötter *et al.*, 2014). The sites fall within 5km of a protected area.

i) Indigenous vegetation on old agri-lands

(Site 1=5.8Ha; Site 2=13.2Ha; Total 19Ha)

This area consists of the two sites described in the previous section and was historically under cultivation which means that the natural vegetation was cleared in order to prepare the lands for agriculture. Of the natural historic vegetation only a few solitary large trees were preserved. Presently, the vegetation covering this community is the result of secondary growth and the establishment pioneer species. The vegetation of most of the old lands is dominated by pioneer grasses but pioneer woody vegetation is well established on sections that have been fallow for a much longer period of time.



The indigenous vegetation on the old lands consist of pioneer species and the structure varies from pioneer grassland dominated by grasses and shrubs to thickets dominated by *Acacia* and Sickle bush

The grass covered sections of both sites are dominated by the grasses *Hyperthelia dissoluta*, *Cynodon dactylon*, *Cynodon nlemfuensis* and *Sporobolus panicoides*. Dominant pioneer forbs and shrubs include *Lippia javanica*, *Diospyros lycioides* subsp. *sericea*, *Acacia karroo*, *Acacia nilotica* and *Dichrostachys cinerea*. In certain places, shrubs and trees consisting of these species form dense thickets. Large trees are limited to secondary growth *Acacia karroo* individuals (pioneers) and large solitary specimens of Marula (*Sclerocarya birrea*) and the wild fig (*Ficus sycomorus*). The large specimens of the last two mentioned species are remnants of the original natural vegetation. Marula trees are also well represented in the surrounding natural woodland and it will not have a significant ecological impact if these trees are removed. However, it is recommended that the large *Ficus sycomorus* specimen on site 2 is conserved as it is of ecological importance as a source of food to many species of animals. No Red Data Listed fauna or vegetation was recorded and the biodiversity importance and ecological functions of these sites are Low.

ii) Natural woodland (Site 3=10.5Ha)

The area to the south and east of site 2 is naturally vegetated and the structure varies from shrubs to medium and large trees. Trees and shrubs recorded in this woodland are *Acacia karroo*, *Acacia nilotica*, *Schotia brachypetala*, *Ziziphus mucronata*, *Sclerocarya birrea*, *Dombeya autumnalis*, *Pterocarpus rotundifolius*, *Rhus lancea*, *Combretum zeyherii*, *Gymnosporia spp*, *Pappea capensis*, *Cussonia spicata*, *Euclea divinorum*, *Euphorbia ingens* and *Peltophorum africanum*. It is evident that bush encroachment is taking place as large areas are invaded by *Dichrostachys cinerea* and *Acacia karroo* thickets. The magnitude of the bush encroachment is quite severe and is even noticeable on historic Google imagery since 2004. No Red Data Listed (RDL) flora was recorded in this section.

Species diversity in this community can be considered to be medium-high and the ecological functions in this habitat will be of local importance. The ecological importance and sensitivity are therefore rated as *High*.



The natural woodland includes a diverse range of trees and shrubs and provide habitat to a large range of fauna

iii) Riparian zones

The primary riparian zone is fragmented as result of the loss of vegetation in the past as consequence of agriculture practices. *Combretum hereroense*, *Acacia karroo* and *Berchemia zeyherii* are dominant and other species present are *Celtis africana*, *Schotia brachypetala*, *Peltophorum africanum*, *Sclerocarya birrea*, *Croton megalobotrys*, *Rhus rehmanniana*, *Ziziphus mucronata*, *Trema orientalis* and *Rhus lancea*. Understory shrubs and climbers that are present are *Ochna natalita*, *Euclea natalensis*, *Diospyros lycioides*, *Isoglossus sp*, *Rhamnus prinoides*, *Rhoicissus tridentata* and *Bauhinia galpinii*. No RDL species were recorded.

This reach of riparian vegetation is very important due to the habitat that is created / provided and it provides an ecological corridor and refuge. Any disturbance thereof will result in significant negative impacts including loss of large trees, fragmentation of habitat and invasion by alien and invasive vegetation. This primary riparian zone has very important stabilizing and ecological functions and has a *Medium - High* sensitivity rating. A 10m buffer zone is recommended as protection around these areas.



The riparian habitat along the Blinkwaterspruit provides refuge and a corridor for fauna as well as important morphological functions.

4.4.2 Terrestrial fauna

As the main anticipated impact on the environmental environment will not result in the loss or fragmentation of natural habitat, a comprehensive fauna assessment was not deemed necessary. It is obvious that the natural terrestrial habitats of the proposed two sites has been completely transformed to cultivated lands in the historic past but has not been cultivated for the past number of years. However, the remaining natural habitat (riparian habitat and natural woodland) provides very important refuge for flora and fauna and the riparian habitat is of high importance for fauna as it provides refuge and a corridor that enables animals to move about the larger study area and to migrate in between adjacent terrestrial habitats that are connected by way of this corridor. These habitats will not be directly affected by the proposed activities and will be protected by a buffer zone.

The old agri-lands provide limited habitat or function for fauna and the transformation to tree lined orchards will not pose a large change to fauna. The loss of the natural woodland will have a negative effect on local fauna, especially birds and reptiles will be affected. No raptor's or large bird's nests were observed in any of the larger trees that will be lost. This fact was affirmed by the owner who is a keen naturalist and is knowledgeable about raptor nests that are present in the local area.

As it is a relatively small portion of woodland that will be lost (10.5Ha) it should not affect large animals (mammals) to a large degree as this portion will not support a large number of individual large animals and these will already be limited due to the bush encroachment in this habitat.

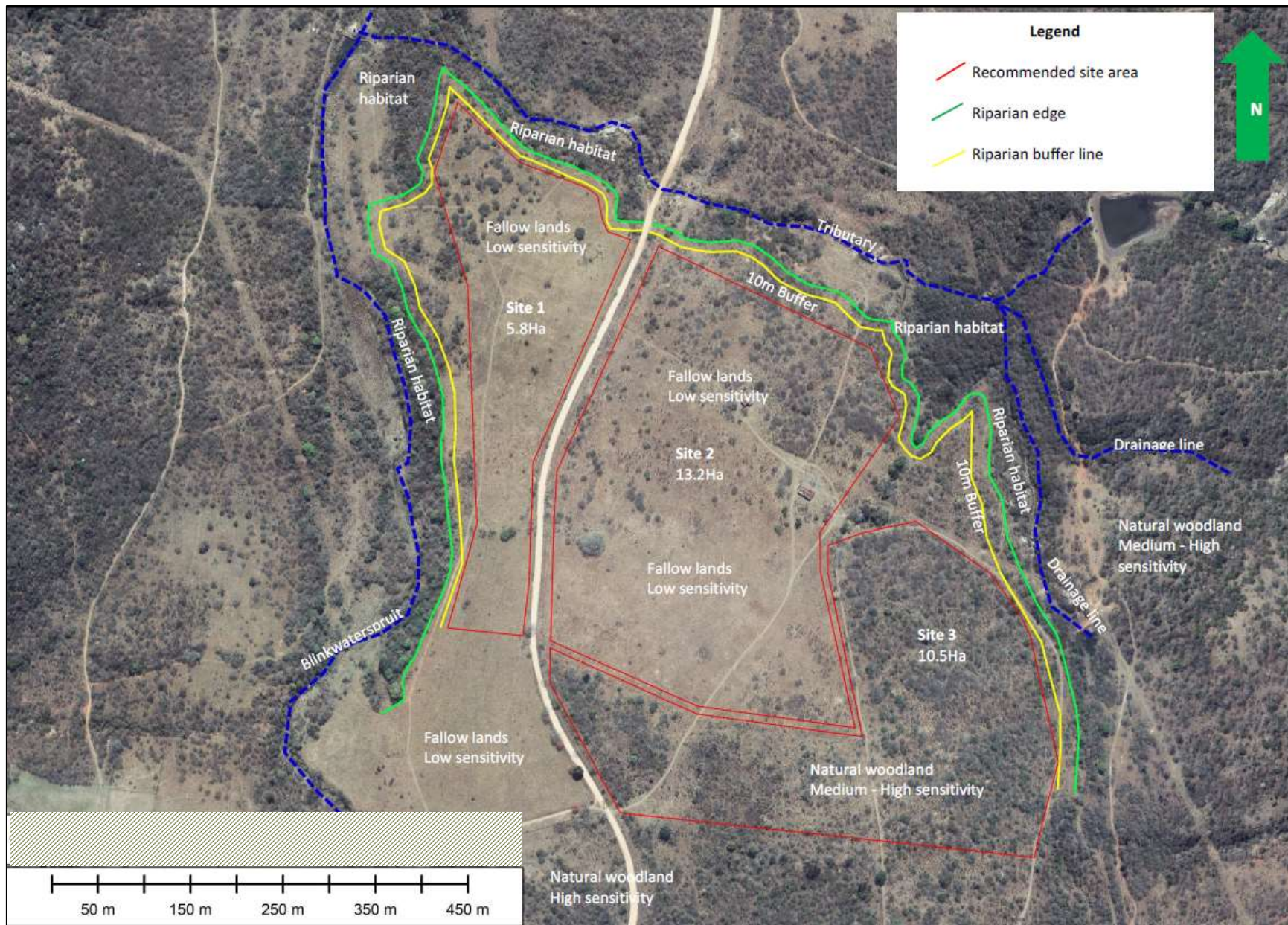


Figure 2: Habitat delineation and ecology sensitivity map

4.4.3 Conservation Important Species

Species of conservation importance are either categorized as Red Data Listed species (RDL species), according to specific scientifically researched criteria and administered by the South African National Biodiversity Institute (SANBI), or as Protected Trees and Plants by the national forests and the provincial nature conservation legislation.

The National List for Red Data flora (2007) is the most updated and applicable reference for vegetation conservation in Mpumalanga. Applicable legislation that protect flora in South Africa and specifically in Mpumalanga Province are the National Environmental Management Biodiversity Act of 2004 (NEMBA), the Mpumalanga Nature Conservation Act of 1998 (MNCA) and the National Forests Act of 1998 (NFA).

No RDL species was recorded and two legally protected tree species were identified: *Sclerocarya birrea ssp caffra* and *Berchemia zeyheri*. Permits will have to be obtained from the Department of Forestry, and/or the Mpumalanga Tourism and Parks Agency, if legally protected trees or plant species are to be removed or destroyed.

4.5 Surface and Ground Water Resources

Afrika Enviro & Biology investigated the sites considered for cultivation (refer to Appendix 3 for the full report).

No wetlands or rocky outcrops are present on the proposed sites.

Site 1 is located east along the Blinkwaterspruit. A tributary of the Blinkwaterspruit forms a prominent valley to the north of the sites.

4.6 Cultural and Historical Features

Two of the proposed sites have been cultivated in the past and it is located on a farm where there has been human activity. Site 3 is also classed as moderately modified.

No signs, objects or sites of cultural importance were found on the sections that are proposed for clearance. There are no known gravesites on and in close proximity to the sites.

The Mpumalanga Provincial Heritage and Resources Agency/ South African Heritage Resources Agency will be informed of the activity.

Should any sites be uncovered during the clearing of vegetation it will be dealt with according to the applicable legislation.

4.7 Social characteristics

The farms are located within the Crocodile Valley Nature Conservancy which includes a number of farms where the natural environment is mostly maintained and protected although it includes some agricultural as well as multiple fenced areas. The proposed sites are situated outside the Paranie Private Nature Reserve which is also located inside the conservancy.

The area is known for its pristine nature and mountainous surrounds.

The Mara valley and conservancy area is known for its pristine nature and mountainous surrounds.

The area also includes a number of guest farms of which Paradors Game Ranch is a well-known venue owned by the applicant.

5. Other considerations

5.1 Water Rights

The proposed land use will require sufficient volumes of water to cultivate and irrigate the areas as planned. MDARDLEA requested that the applicant demonstrate that water is available at the required capacity for this kind of application especially if crops such as avocados were to be planted.

The applicant has an irrigation dam upstream of the sites to be cultivated. The dam was built in 1958 and registered for abstraction. The confirmed storage capacity is 124 644m³ with an abstraction of ±90 000m³/annum.

The applicant has verified abstraction rights on his property for 306 261 m³ per annum for the irrigation of 59.7 ha. IUCMA confirmed and verified the capacity. Refer to the attached document under Appendix 5.

The applicant consulted Mr Ben Stander from *Illustra Civil and Agricultural Development services* with regards to the water requirements avocado orchards. The estimated calculations are attached under Appendix 5.

Note that the applicant will only make use of the water use rights from the dam that is vested in his properties and will not make use of the rights from this resource belonging to another landowner. The applicant confirmed having a right to only half of the rights in this dam.

The dam that is located at the sites belongs to the previous landowner but the applicant has permission to irrigate from this dam after the water was released from the higher laying dam.

Following is a translation of the information on the water requirements for avocados (Find the letter addressing the water demand attached as Appendix 5):

According to the National Department of Agricultural and ITSG the annual requirement in terms of water is calculated at 786mm per annum per adult avocado tree.

According to the weather station resources the annual effective rainfall for the Barberton area is 379mm.

The applicant will plant 10m x 7m areas. The area that is taken up by the tree and not only the area that will be wetted are taken into account in the calculations. This will be approximately 8m x 7m depending on the cultivar.

The water requirement per tree is then: $8 \times 7 \times 0,786 = 44\text{m}^3$.

A total of 4286 trees will be planted on the planned 30 ha. The total water requirements are 188 584m³ per year.

The applicant also consulted a soil specialist and made provision to plan and lay the new orchards out in a way that would ensure successful cultivation as well as the responsible use of available water.

The applicant has enough water to cultivate the planned areas.

With the use of probes the water use will be even better controlled.

Micro irrigation rather than drip irrigation will be implemented as it results in better yields and because the applicant has sufficient water to do so. The soil report suggests either one of the irrigation methods.

5.2 Removed vegetation

The tree cover will be removed from the application sites and tree lines will be deep ripped. This will result in a large volume of vegetative material that would need to be used or discarded.

Proposed method to deal with the removed vegetation:

Removed vegetation may not be burnt on the site or disposed of into any of the natural areas or drainage lines. The applicant can use it in the stabilisation of areas with high erosion potential or as mulch.

Protected plants should be translocated where possible into the adjacent untransformed areas and can be removed and/or destroyed only as and if permitted in terms of the Mpumalanga Conservation Act, 1998 (Act No. 10 of 1998) and the National Forest Act, 1998 (Act No. 84 of 1998).

Large areas of untransformed vegetation communities representative of the species that will be affected remain undeveloped on surrounding farms. The trees that will be affected are very large and it is unlikely that they will survive translocation if avocados were to be planted in their place. The MTPA suggested in this case that the applicant must plant similar species and the same number of indigenous trees as removed.

As stated in the ecology report, Marula trees are also well represented in the surrounding natural woodland and it will not have a significant ecological impact if these trees are removed. However, it is recommended that the large *Ficus sycomorus* specimen on site 2 is conserved as it is of ecological importance as a source of food to many species of animals.

5.3 Access to the property and roads

There is an existing access road to the farm from the Mara turn-off and then there are a number of internal roads that will be used for the operation and management of the planned orchards.

6. Consideration of alternatives

6.1 Site and farming alternatives

The application is specific to the properties as indicated.

Environmental authorisation is required due to the fact that the identified sections have not been cultivated in the preceding ten years.

The application is specific to the three sites that have been identified by the applicant. Initially the applicant identified sites for macadamia farming on Paradors Game Farm (see site alternatives on map below) but after public consultation it was evident that the proposed land use was not supported. At the end of the process that was undertaken for those sites, the applicant received authorisation from MDARDLEA to clear the areas for grazing purposes and not macadamia farming as was planned. These sites could be considered as alternatives but this serves to motivate that the alternative not be assessed in this report as it

was extensively investigated in a separate EIA process and a decision reached on the application.

The applicant however still endeavors to farm commercially as there is a demand in the market and he is able to become suitable land despite the outcome of the first application. This is what led to the proposed localities being identified. The property is in the process of being acquired by the applicant and the landowner consented to the EIA process being conducted.

There are no other site alternatives and considering crop alternatives will not result in significantly different impacts. The soil suitability, water availability, proposed layout, irrigation and other management strategies is what would result in long term impacts regardless of the crop grown which in this case would be only cultivars that are known to thrive in the Lowveld (tropical fruit, nuts, avocados).



Figure 3: Alternative sites

6.2 Layout alternatives within the site

6.2.1 Cultivation site alternatives

The applicant took into account the most suitable areas on this property that was previously cultivated and that would be suitable for the cultivation. The size of these areas was determined by the water availability and soil suitability and definitely the present ecological state.

The ecological features of the sites were assessed and an impact assessment done. A soil and agricultural specialist also assessed the site and made certain recommendations.

All three sites as indicated on the attached site map and described in the report is suitable for the proposed activity without it having potentially high significant impacts on the receiving environment.

The applicant planned to stay within the areas that were previously cultivated and are not pristine. The more sensitive riparian zones close to the sites were also taken into consideration. The ecologist took into account a number of factors in the assessment with proposing the areas that would be suitable whilst providing for appropriate buffers. The location of all three sites is already a significant mitigation measure and to a degree this determines the expected significance of the rest of the impacts that were assessed.

A total area of 29.5 ha can be included in the application for the authorisation of the removal of indigenous vegetation.

Site 1, 2 and 3 are the preferred sites and proposed for authorisation.

The indigenous trees are not a significant issue as indicated by the ecology report but the applicant is also willing to plant extra indigenous trees in an adjacent undeveloped area in the place of those that would need to be removed.

6.3 No-go alternative

Cultivation:

The “no-go” alternative would entail that the areas that was investigated and those included in the application is not cleared for cultivation for avocados or any other crops. It will remain undeveloped.

The “no-go” alternative is not the preferred option for the applicant. It is a strong market to enter in and invest in. Despite the site being located in a conservancy it is not within a protected area and it would not be an environmental fatal flaw should the application be considered favorably by the competent authority given that the areas applied for meet the requirements of arable land.

7. Public Participation Process

7.1 Introduction

In order to afford the Interested and Affected Parties (I&AP's) the opportunity to become involved and be part of the process the following public participation process was followed. During the process I&AP's were given the opportunity to raise issues of concern that would be recorded and included in the scoping and environmental impact assessment.

7.2 Identification of Interested and Affected Parties

At the start of the assessment effort was made to identify and register interested and affected parties. This included people who may be affected by the activity e.g. adjacent or nearby landowners, ward councillor as well as relevant authorities (Refer to Appendix 6A for the list of I&AP's).

7.3 Newspaper and Site Notices

A notice in the prescribed format was placed in the Lowvelder of 11 July 2017. A site notice was placed at the sites along the gravel road that traverses the area on the same date. The notices informed potentially interested and/or affected parties of the process and opportunity to review the report that will be available for comment (Refer to Appendix 6B).

7.4 Public Participation Meeting

Due to the type of activities applied for and the proposed landuse, direct consultation was and is taking place with I&AP's who raised concerns.

If the response from the I&AP's to the scoping report or EIA reporting deems it to be necessary a public meeting will be scheduled to discuss issues and concerns raised by the parties. Commenting parties will first be consulted directly.

7.5 Scoping Report

A Scoping report and Plan of Study was made available to the Interested and Affected parties with the request for comments during the months of July and August 2017. A 30 day commenting period was provided as required.

Comments were received on the Scoping report from an adjacent landowner, the Competent Authority, Mpumalanga Tourism and Parks Agency and the Inkomati Usuthu Catchment Management Agency. The comments received are included in the EIR, refer to the Issues and Response Report (Appendix 6C). No serious concerns were raised.

The approval of the Scoping phase was obtained on 22 August 2017 and marked the end of the Scoping phase and the commencement of the Environmental Impact Assessment phase of the application.

7.6 Plan of Study for Environmental Impact Assessment

Contained in the scoping report was the Plan of Study for EIA (POS) which sets out the proposed approach to the EIA process. The POS entailed the following:

- (i) key tasks to be performed as part of the EIA process,
- (ii) stages at which the competent authority will be consulted,
- (iii) method of assessing the environmental issues and alternatives,
- (iv) public participation process to be followed during the EIA process.

7.7 EIA Report

The Environmental Impact Assessment (EIA) report comprises an overview of the assessment of the proposed activity and an outline of the issues, concerns raised by I&AP's during the scoping process. The assessments and findings of the specialist study have been included in the EIA report.

The environmental impacts of the proposed removal of indigenous vegetation has been assessed and rated and mitigation and management measures were defined.

The EIA report will be made available to the Interested and Affected Parties including State Departments for a commenting period of 30 days.

Any further comments received will be included with responses in the Issues and Response report with a full copy of the correspondence in this final submission to the Department for consideration.

7.8 Environmental Authorisation

On review of the information submitted the Department will either decide to grant or deny Environmental Authorisation for the proposed activity. If authorisation is granted the Environmental Authorisation would include conditions that will apply to the activities.

The Authorisation or decision will be communicated to all registered I&AP's as soon as received from DARDLEA in line with Chapter 2 of the EIA Regulations, 2014 as amended.

7.9 Authority Liaison

An application with the relevant documentation was submitted to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) in July 2017. A reference number (1/3/1/16/1 E - 108) was obtained from the Department.

A site visit with the MDARDLEA officer was conducted on 21 July 2017 and the sites was visited, the proposed activities were discussed and questions answered.

The Scoping Report and Plan of Study for the EIA was submitted to the MDARDLEA and approval to continue with the Environmental Impact Assessment process was obtained on 22 August 2017 (refer to Appendix 6D for proof).

8. Environmental Legislation and Policy

8.1 The National Environmental Management Act, 1998 (Act No.107 of 1998)

The Environmental Impact Assessment Regulations, 2014 (as amended), published under Section 24(5) of the National Environmental Management Act (NEMA) for implementation from 08 December 2014 is applicable.

The Scoping and Environmental Impact Assessment is undertaken in terms of the EIA regulations published in the Government Notice No. R982, R983 and R984 under Section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

The activities requiring the Scoping and Environmental Impact Assessment Process are as follows:

R.983, 2014: Activity 27 - The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

R984, 2014, Activity 15 - The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the

undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

As required by the EIA regulations an environmental authorisation from the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs would be required before the applicant can commence with the proposed activities.

8.2 Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)

A Permit for cultivation will be obtained by the applicant in terms of the Act for the breaking of soil that has not been disturbed in the preceding ten years. This is a process separate from the EIA process.

The regulations (GN 1048) published under this Act also prescribes conditions for the cultivation of virgin soil and the protection of soil against water and wind erosion.

This act as well as the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) Alien and Invasive Species Lists, 2014 prescribes the control of alien plants.

8.3 The National Water Act, 1998 (Act No. 36 of 1998)

The proposed areas for cultivation will remain outside the riparian zone and does not entail a water use.

The abstraction of water for irrigation is a listed water use that needs to be registered. The IUCMA confirmed water availability (Refer to Appendix 5).

The applicant will only make use of the water rights vested in his property.

For the operation of the farm, the applicant is allowed to use water only as regulated and prescribed in the National Water Act, 1998 (Act No. 36 of 1998). Should the applicant exercise any Section 21 water uses that is not yet registered or authorised, the necessary registration or licencing must be obtained by the applicant in a process separate of the EIA process.

8.4 National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)

The purpose of this Act is to prevent and combat veld, forest and mountain fires. The applicant must be aware of the duty on owners to prepare and maintain firebreaks irrelevant of the applied for activities or the proposed land use.

8.5 Other relevant legislation

Legislation aimed at the protection of natural resources:

- The National Water Act, 1998 (Act No. 36 of 1998)
- The Mpumalanga Conservation Act, 1998 (Act No. 10 of 1998)
- National Forest Act, 1998 (Act No. 84 of 1998)
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
- National Environmental Management: Protected Areas Amendment Act 31 of 2004

The main objective of the legislation listed above is to ensure a safe and healthy environment as well as the sustainable use of natural resources.

The activity can comply with the mentioned legislation by means of the applicant having to apply for the necessary permits in terms of relevant legislation for the removal of

conservation important plants and animals and exercising the conditions as put forward in the applicable legislation.

The Mpumalanga Conservation Act, 1998 and NEMBA, 2004 pertaining to biodiversity were also taken into consideration by the specialist that conducted the biodiversity assessment.

Both the clearing of the areas as well as the operation of the agricultural activities will have to comply with the objectives of the above mentioned legislation.

Other legislation that may in general be relevant to the proposed activity includes:

- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
- The Constitution, 1996 (Act No. 108 of 1996)
- Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)
- National Environment Management: Waste Act, 2008 (Act No. 59 of 2008)

9. Environmental Issues and Potential Impacts

9.1 Assessment Methodology

The activities associated with the proposed activity will bring about certain aspects for example the physical removal of vegetation and exposure of unprotected soil surfaces. Aspects of the activity in turn interact with and could potentially have negative impacts on the receiving environment (e.g. air, water, soil, fauna and flora).

Potential impacts can have certain consequences on the receiving environment and these needs to be identified and mitigated to ensure that the effects are prevented, minimised and/or controlled.

The potential impacts are assessed under the different receiving environments.

It is important to note that the application is for the removal of indigenous vegetation and not the actual farming operation. The scope of the EIA report does not aim to assess the proposed landuse in full detail as it is not a listed activity in terms of the EIA regulations.

Where applicable, mention is made of certain aspects of the proposed agricultural activities expected after removal of the indigenous vegetation.

The following criteria and rating mechanism is used for the evaluation of significance of potential environmental impacts.

Table 1: Impact Assessment Rating Criteria

Nature of Potential Impact	Rating or Category	Description of Impact on the Environment
Extent	Site	Limited to the site and its immediate surroundings
	Local	Up to 5km from the project site
	Regional	Beyond 5km of site. Up to 20km radius from the project site
	Provincial/National	Will affect beyond 20km from the site
Duration	Short term	0 - 5 years. Construction and early operation.
	Medium term	Operational phase up to 25 years
	Long term	Operational phase longer than 25 years
	Permanent	Impact will continue after the operational phase
Intensity	Very low	Limited damage to a small area. Natural, cultural or social functions or processes are not affected/negligible.
	Low	Where the affected environment is altered but natural, cultural or social functions or processes are only marginally affected.

	Medium	Natural, cultural or social functions or processes is notably altered but can continue although in a modified way.
	High	Where the natural, cultural or social functions or processes are severely altered to the extent that they temporarily/permanently cease.
	Very high	Where the natural, cultural or social functions or processes are altered in such a way that they will permanently cease. Irreparable damage.
Probability	Unlikely	Less than 20% probability that impact may occur.
	Probable	There is a good chance that the impact may occur.
	High Probability	It is most likely that the impact will occur, more than 50% probability that impact may occur.
	Definite	More than 90% probability that impact may occur.
Significance	Very low	Impact likely to be very low and mitigation is not required
	Low	Impact likely to have little real effect or Mitigation is easily achieved or little will be required.
	Medium	Moderate impact and could influence decision if not mitigated or Mitigation is both feasible and fairly easily possible. Modification of the project design or alternative action may be required.
	High	Mitigation essential to reduce to acceptable level or Mitigation difficult, time-consuming and/expensive and it may affect the decision to continue or approve.
	Very High	No possible mitigation or mitigation is extremely difficult, time consuming and/or expensive. Decision to approve will be affected.

Environmental impacts are assessed with reference to the nature, extent, duration, intensity and probability of identified impacts. The significance of the potential impact is a qualitative assessment based on the rating of the different criteria. The significance of impacts before and after mitigation will be indicated in the report. The assessment must also mention the degree to which impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated.

Note – tree lines in the assessment refers to the rows in which the avocado trees would be planted. For completeness sake, the assessment of Alternative 2 is still included in the following section despite it not being the preferred alternative.

9.2 Environmental Concerns and Potential Impacts – cultivation sites

This section assesses the scoped/identified environmental issues and potential impacts of the proposed removal of indigenous vegetation. It includes the areas that have been identified as suitable for agricultural purposes.

Table 2: Impact summary

Impact description	Period	Extent	Duration	Intensity	Probability	Significance pre-mitigation	Significance post mitigation
Air (dust) pollution	Clearing	Local	Short	Low	Probable	Low	Low
Loss of topsoil	Planning	Site	Medium	Medium	Probable	Medium	Low
Erosion and sedimentation	Clearing	Local	Medium	Medium	Probable	Medium	Low
Erosion and sedimentation	After clearing	Local	Medium	Medium	High	Medium	Low
Surface water pollution - erosion	Clearing	Local	Short	Medium	Probable	Medium	Low
Loss of aquatic habitat and invasion of alien	Clearing and after	Local	Medium	Medium	Unlikely	Medium	Low

plants							
Degradation of drainage lines	Clearing and after	Local	Medium	Medium	Unlikely	Medium	Low
Demands on surface water resources and water quantity	Operation	Local	Medium	Medium	Probable	High	Low
Surface water pollution	Operation	Local	Medium	Medium	Probable	High	Low
Loss of indigenous vegetation from the sites	Clearing	Site	Permanent	Low	Definitely	Medium	Medium
Loss of important or sensitive habitat	Planning and clearing	Regional	Permanent	Medium	Unlikely	Medium	Low
Loss of conservation important flora & fauna from the sites	Planning and clearing	Site	Permanent	Medium	Probable	Low	Low
Loss of habitat suitable for fauna	Planning and clearing	Site	Permanent	Low	Probable	Medium	Low
Change, fragmentation or loss of habitat and connectivity	Clearing	Local	Permanent	Low	Unlikely	Low	Low
Invasion of weeds and alien vegetation	Clearing and operation	Site	Long	High	Probable	Medium	Low
Loss of fauna – pest control	Planning and clearing	Site	Permanent	Low	Probable	Medium	Medium
Visual impact	Clearing	Local	Short	Low	Definite	Medium	Low
Visual impact	Operation	Local	Long	Low	Probable	Medium to Low	Low
Noise impact on surrounds	Clearing	Local	Short	Medium	Probable	Low	Very Low
Noise on surrounding area	Operation	Local	Long	Medium	Probable	Medium	Low
Increase of traffic volumes	Clearing	Local	Short	Medium	Probable	Very Low	Very Low
Socio-economic impact (+)	Clearing	Local	Short	Medium	High	High	High (+)
Social impact (-)	Clearing	Local	Long	Medium	High	Medium	Low

Biophysical impacts

9.2.1 Topography

The proposed activities entail the removal of indigenous vegetation and replacing it with orchards of avocado trees. The topography of the proposed areas will not change. There is no significant impact.

9.2.2 Air quality

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance after mitigation
Air (dust) pollution	Clearing	Local	Short	Low	Probable	Low	Low

Planning and clearing:

The proposed removal of the vegetation and disturbance of ground cover of the sites may cause dust pollution for the duration of the clearing of the application site.

There are no residential dwellings directly adjacent the area for which environmental authorisation is required. The impact is expected to be of a low significance.

The impact will not only be of a short duration but also of a temporary nature and will not result in irreversible air pollution impact although it could be of a low cumulative nature as a result of other similar activities on the surrounding farms but not in direct proximity to the sites.

A few mitigation measures can be implemented to manage the impact and may include:

- Farm workers that help to clear the site should not be allowed to have open cooking fires. Accidental fires should be prevented.
- Clearing should not be done during excessively windy periods.
- The exposed soil surfaces must be planted and/or stabilised as soon as practically possible. Also refer to mitigation measures as proposed under the soil assessment.
- A natural or other acceptable grass cover must be re-established in between tree lines as soon as practically possible.

Operational:

The operational activities which will entail the active farming of the areas that will be cultivated may result in potential air quality impacts caused by dust from the cleared areas until such a time that the soil is settled. Air pollution may also be caused by the use of chemicals and fertilisers for crop management and pest control.

It is suggested that vegetation growth between tree lines be re-established either physically or naturally but as soon as possible. This should lower the risk for dust pollution during operation.

As far as crop protection is concerned, the applicant must make use of a registered consultant and micro-biologist. The use of chemicals must be monitored and apart from the fact that the misuse can cause great environmental damage, it is also a costly exercise and can negatively affect the applicant.

The applicant committed to make use of liquid organic and biological integrated fertilizer in split applications (spoon feeding). This is done for optimum utilization and will prevent runoff contamination, limit the leaching of excessive fertilizers and prevent the pollution and eutrophication of water resources.

General:

Impacts may be of a low cumulative nature as there are other areas in the Mara Valley under cultivation. The applicant must endeavour to use chemicals and fertilisers in a way that will not unnecessarily harm the receiving environment.

9.2.3 Geology and soil conditions

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance after mitigation
Loss of topsoil	Planning	Site	Medium	Medium	Probable	Medium	Low
Erosion and sedimentation	Clearing	Local	Medium	Medium	Probable	Medium	Low
Erosion and sedimentation	After clearing	Local	Medium	Medium	High	Medium	Low

Clearing:

The areas under application were not cultivated for more than 10 years. The physical removal of indigenous vegetation is not going to change the geology or soil conditions of the sites but the suitability of the soil for planting will determine the potential impacts during operation as well as the success of the crops.

The activities will result in unprotected and disturbed soil surfaces which may be prone to soil pollution and erosion. The activities may result in the irreplaceable loss of topsoil but it can however be prevented and managed.

Soil erosion may also result in the sedimentation of the drainage lines adjacent the sites and downstream environment. Erosion can have indirect impacts and may over time extend into the undeveloped areas adjacent the sites if it is not addressed. This may result in the modification of the more naturally vegetated areas.

After the sites have been prepared and planted there may still be a risk for erosion due to the soil disturbances that took place. The re-compaction of the soil in the areas that will be newly cultivated must be prevented as it could interfere with the ability of the soils to keep water.

The impact is of medium significance during clearing and a slightly higher significance after clearance took place because there are drainage lines in close proximity to the sites and new groundcover will have to be established first. Mitigation is possible and must be implemented to lower the significance of the identified impacts.

Planning & Operation:

The soil specialist investigated the on-site soils and made certain recommendations. The Hutton soils have a higher erosion risk than the other types. A moderate salinity build-up may occur in all the soils and this needs to be monitored. Furthermore all types have a medium workability requiring management. The Shortlands soils are wet.

The impact on the soils of the farm could be of a high significance in that valuable topsoil can be lost and this could result in indirect impacts on untransformed areas. But the agriculturist recommended some measures to mitigate for the potential impacts.

The irrigation planning and the layout of the units to be cleared and how it is done will impact on the soils of the site which in turn may have impacts on the surface water resources. It may also determine the success with which the applicant will be able to cultivate and manage these areas. An irrigation strategy must be planned and scheduling is essential as pointed out by the agriculturist.

The applicant committed to make use of liquid organic and biological integrated fertilizer in split applications (spoon feeding). This is done for optimum utilization and will prevent runoff contamination, limit the leaching of excessive fertilizers and prevent the pollution and eutrophication of water resources.

The Land Suitability Evaluation states that: 'It is the opinion of the writer that should the specified precautions been taken and the current management practices being upheld; and professional irrigation planning is done, according to homogeneous soil typing, the Weltevreden would be suitable for the proposed avocado extension.'

Measures and findings with regards to the different soil types as per the LSE report:

Hutton soils:

- Because of the good drainage careful irrigation scheduling is essential, a drip or micro irrigation system is recommended.
- Nutrients: Below average levels of N are generally required.
- Note that the soil has:
 - a low N + S mineralization capacity.
 - a low base status and a low P fixation.
 - moderate K reserves.

- Split applications are recommended.

Bainsvlei soils:

- Because of the moderate to good drainage careful irrigation scheduling is essential, a drip or micro irrigation system is recommended.
- Moderate salinity build up may occur.

Oakleaf soils:

- High productive potential soil with physical and chemical properties.
- Soil should not be worked when too wet or dry.
- Irrigation scheduling is essential, a drip or micro irrigation system is recommended. Moderate salinity build up may occur. Compaction may be a problem on soils with a high proportion of silt.
- Low base status, above average amounts of fertilizer may be needed.

Shortlands soils:

- High productive potential soil with physical and chemical properties.
- Soil should not be worked when too wet or dry.
- Erosion hazard: very low.
- Irrigation scheduling is essential, a drip or micro irrigation system is recommended.
- Low salinity hazard unless low quality irrigation water is used.
- Moderate base status, above average N mineralization and very little denitrification problems, higher amounts of K may be needed.

The following measures apply to all the soil types and include some general measures recommended by the Suitability Evaluation:

- Strip cropping, planting the trees on ridges (700mm high and 1,500 – 2000 mm wide), is the recommended land utilisation.
- To prevent erosion, a grass cover is to be established between ridges (*Chloris gayana* – Rhodes grass). Minimum tillage is recommended on the in-between ridges areas.
- The areas should be cleared and prepared only when the applicant is ready to start planting.
- Limit disturbances to the areas to be cultivated.
- Leave the large trees in place during the clearing and preparation activities where possible or replace with same species.
- Corrective actions have to be taken as and when required to stop erosion.
- Avoid vegetation removal and handling of exposed soils in excessively windy or rainy conditions.
- Maintain erosion preventative structures on a continual basis.
- Also refer to the management strategies under Section 9.2.4
- Leave some ground cover during clearing activities if possible.
- Plant the sides of the ridges with a ground cover as soon as possible after clearing.
- Only rip the sections or lines in which the avocado trees must be planted and maintain the natural grass cover in between the lines where possible.
- Plan and create the tree lines with the natural contours as far as possible. Planting direction should be secondary to the conservation of the soil therefore create the necessary contour berms to limit erosion of the disturbed soils.
- The removed woody vegetation can be used to stabilise areas prone to erosion.
- Implement the use of mulch to prevent crusting of the soils in areas where it is prone to happen.
- Avoid the re-compaction of the soil of especially the tree lines as well as the in-between areas.

9.2.4 Surface Water and Aquatic Ecology impacts and management

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance after mitigation
Surface water pollution - erosion	Clearing	Local	Short	Medium	Probable	Medium	Low
Loss of aquatic habitat and invasion of alien plants	Clearing and after	Local	Medium	Medium	Unlikely	Medium	Low
Degradation of drainage lines	Clearing and after	Local	Medium	Medium	Unlikely	Medium	Low
Demands on surface water resources and water quantity	Operation	Local	Medium	Medium	Probable	High	Low
Surface water pollution	Operation	Local	Medium	Medium	Probable	High	Low

Clearing:

There are two drainage features associated with the sites that were investigated for cultivation. One is the main stream, the Blinkwaterspruit and the other a tributary. The riparian habitat along the Blinkwaterspruit (west of the sites) provides refuge and a corridor for fauna as well as important morphological functions. This primary riparian zone has very important stabilising and ecological functions and has a Medium - High sensitivity rating.

The sites to be cleared are however all located outside of the riparian zones that were identified and described in the ecology report. In addition a buffer zone is proposed that would be adequate to conserve the riparian habitat. This will minimise potential impacts.

The proposed clearing activities could result in the degradation of the habitats associated with the surface water resources if clearing and operational management of the sites are not carefully managed e.g. dumping of soil and vegetation and soil compaction in the riparian zones.

The removal of vegetation, specifically indigenous vegetation, will open up disturbed soil surfaces to the invasion of alien invader plants which could extend into the riparian areas and drainage lines if not managed. Hardened and unprotected soil surfaces close to water resources may result in an increase in storm water run-off from the sites which could potentially cause erosion, the loss of top soil, sedimentation, damage to aquatic habitat as well as surface water pollution.

Should clearing not be controlled it may impact on the biodiversity and hydrology of the drainage lines as well as have a negative downstream impact. The direct cumulative impact is low as the sites are located in an area mostly protected and there are no other significant impacts taking place that could affect the drainage lines in the vicinity of the sites.

If the riparian areas are not maintained and the clearing or dumping of spoil material takes place in the sensitive areas, it may result in the potential loss of downstream aquatic or riparian habitat. It could be of an irreplaceable and irreversible nature if not mitigated.

The buffer zone includes the riparian zone as well as the adjoining terrestrial transitional zone. There is enough space between the proposed edge of the lands and the buffer line for a service road.

It is important to note that the location of the proposed sites already mitigate for many of the potential impacts. The potential impacts are of medium to high significance before mitigation.

Mitigation measures must include but is not limited to at least the following:

- The drainage lines with the associated riparian vegetation should be protected. Clearly demarcate the sites before vegetation clearance starts.
- Exclude the riparian zone from any agricultural practices including management practices such as roads or firebreaks.
- Limit the clearance of vegetation only to the areas that will be cultivated.
- A 10m buffer line must be delineated around the outer edges of each cultivation site where adjacent to drainage features.
- The area in between the edge of the lands and buffer zone can be used for a firebreak and where necessary a service road for the additional purposes of maintenance and access to alien vegetation control parties.
- The laying out of the buffer line must not result in a significant loss of any large indigenous trees.
- No stripped vegetative or soil material must be disposed of into the drainage lines, buffer or riparian zones.
- Tree lines should be planned to follow natural contours as far as practically possible to prevent increased loss of topsoil into the drainage lines. Alternatively sufficient contour walls must be planned and implemented to protect the drainage lines.
- An alien eradication programme should be in place for the maintenance of the drainage lines.
- From the start of clearance in preparation for planting, stormwater management appropriate for the receiving environment must be implemented.
- Stormwater run-off from the cleared areas must not be concentrated.

Operation:

The applicable recommendations and mitigation measures for the clearing phase must also be implemented during the operational phase to lower the potential impacts on surface water quantity and quality. The main measure is to maintain the buffer line and limit farming activities to the areas approved for cultivation.

The creation and operation of the cultivated areas as well as the use of chemicals and fertilisers may result in surface water pollution and negative impacts on the aquatic environment especially with unplanned spillages or wrong use of these substances.

The applicant must implement best practices and the use of chemicals must be strictly monitored. The applicant should also monitor the drainage lines and riparian areas for signs of erosion and implement corrective action as required. The buffer as proposed must be maintained throughout the operational phase.

The applicant committed to make use of liquid organic and biological integrated fertiliser in split applications (spoon feeding). This is done for optimum utilisation and will prevent runoff contamination, limit the leaching of excessive fertilisers and prevent the pollution and eutrophication of water resources. The use of drip irrigation will also ensure the more effective use of water.

The proposed activities will also entail that surface water is abstracted for the irrigation of the crops that will be planted. The proposed cultivation will increase the demand on surface water and it is important that only a size area that can be successfully farmed and irrigated should be cleared.

Impacts on the surface water resources are of a low significance after mitigation.

9.2.5 Terrestrial ecology

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance after mitigation
Loss of indigenous vegetation from the sites	Clearing	Site	Permanent	Low	Definitely	Medium	Medium
Loss of important or sensitive habitat	Planning and clearing	Regional	Permanent	Medium	Unlikely	Medium	Low
Loss of conservation important flora & fauna from the sites	Planning and clearing	Site	Permanent	Medium	Probable	Low	Low
Loss of habitat suitable for fauna	Planning and clearing	Site	Permanent	Low	Probable	Medium	Low
Change, fragmentation or loss of habitat and connectivity	Clearing	Local	Permanent	Low	Unlikely	Low	Low
Invasion of weeds and alien vegetation	Clearing and operation	Site	Long	High	Probable	Medium	Low
Loss of fauna – pest control	Planning and clearing	Site	Permanent	Low	Probable	Medium	Medium

Two of the sites have been intensely cultivated in the past for a very long period of time with site 3 being encroached. It has been fallow land for more than ten years. There are some large solitary trees which include Marula -*Sclerocarya birrea* and the wild fig - *Ficus sycomorus* on site.

The biodiversity assessment concludes the following as abstracted from the report:
 Site 1 & 2: Large trees are limited to secondary growth *Acacia karroo* individuals (pioneers) and large solitary specimens of Marula (*Sclerocarya birrea*) and the wild fig (*Ficus sycomorus*). The large specimens of the last two mentioned species are remnants of the original natural vegetation. Marula trees are also well represented in the surrounding natural woodland and it will not have a significant ecological impact if these trees are removed. However, it is recommended that the large *Ficus sycomorus* specimen on site 2 is conserved as it is of ecological importance as a source of food to many species of animals. No Red Data Listed fauna or vegetation was recorded and the biodiversity importance and ecological functions of these sites are Low.

Site 3: Species diversity in this community can be considered to be medium-high and the ecological functions in this habitat will be of local importance. The ecological importance and sensitivity are therefore rated as High.

The remaining natural habitat (riparian habitat and natural woodland) provides very important refuge for flora and fauna and the riparian habitat is of high importance for fauna as it provides refuge and a corridor that enables animals to move about the larger study area and to migrate in between adjacent terrestrial habitats that are connected by way of this corridor. These habitats will not be directly affected by the proposed activities and will be protected by a buffer zone.

The loss of the natural woodland will have a negative effect on local fauna, especially birds and reptiles will be affected. No raptor's or large bird's nests were observed in any of the larger trees that will be lost. This fact was affirmed by the owner who is a keen naturalist and is knowledgeable about raptor nests that are present in the local area.

As it is a relatively small portion of woodland that will be lost (10.5Ha) it should not affect large animals (mammals) to a large degree as this portion will not support a large number of individual large animals and these will already be limited due to the bush encroachment in this habitat.

The sites will need to be cleared of most vegetation in order to prepare the required ridges for planting purposes.

The impact of fencing-off the areas is also considered to be a medium impact if mitigated. The reason would be that baboons and monkeys are known to be potential pests and small mammals could damage the young trees. The fence will hopefully protect the orchards mostly from browsing mammals.

The proposed activities will result in the loss of natural vegetation from the sites which is not easily reversible and is of a more permanent nature but it will be replaced with other trees although not indigenous. The protected species and other large trees that will be lost are well represented in the surrounding area. Clearing is not expected to result in the loss of high numbers of protected plants.

The clearing of vegetation will result in the disturbance of soil cover and exposure of unprotected surfaces which may encourage the growth of alien exotic plants. It can impact on the ecological functioning of the adjacent natural areas if not managed and controlled.

The impact is of a medium significance and can be of a long term nature. The biodiversity report also states that it should also be considered that a large amount of the natural vegetation that will be lost actually constitutes bush encroachment and the loss of these areas will not be of high significance.

The proposed sites can be accessed from the existing tracks and dirt roads and it should not be necessary to construct new roads across the riparian areas.

Most of the impacts on the terrestrial ecology can be mitigated to be of a low significance.

The following additional mitigation measures should be implemented but is not limited to:

- Limit the clearance of vegetation only to the areas that will be cultivated.
- Clearance should be planned within the areas as indicated by the ecology study.
- The buffer line must be delineated.
- The area in between the edge of the lands and buffer zone can be used for the additional purposes of maintenance and access to alien vegetation control parties.
- The buffer line must not result in a significant loss of large indigenous trees.
- The buffers may not be used as fire breaks. Firebreaks should be added onto these areas. The ecologist confirmed that there is enough space to achieve this goal.
- No unauthorised clearing or temporary access roads must be permitted within the riparian areas or drainage lines. Follow existing tracks where possible.
- It is recommended that an Environmental Control Officer (ECO) is appointed who will be responsible to actually delineate the buffer zone on site (considering actual on site conditions and to ensure that large trees are not destroyed for this purpose).
- These buffers must be maintained throughout the operation of the farm.
- No unauthorised clearing or temporary access roads must be permitted within the riparian areas or drainage lines.
- Retain the *Ficus sycomorus* specimen on site 2.
- The applicant should replant a similar number of Marula trees to that which will be lost alongside fence and roads where they will not be affected in future.
- Obtain the necessary permits and licences from MTPA for the relocation, removal or destruction of any protected plants or animals.

- Translocation of conservation important plants within the impact footprints should be considered above destruction. Identified conservation important plants must be translocated to adjacent representative habitat. This should be done under the supervision of an experienced botanist / horticulturist.
- Collection of firewood or any other plant resources by farm workers especially in areas not cleared is prohibited.
- No wild animals may under any circumstances be handled, removed, injured or killed.
- Evidence of poaching among workers should be followed up by the ECO and guilty parties should be prosecuted under the MNCA.
- The fence around the site must be a normal game fence and not consist of razor wire that will harm any animals.
- All reasonable steps to avoid any fires must be taken. Open fires for cooking purposes for farmworkers must only be permitted in an area demarcated for this purpose.
- The applicant must consider making removed woody material available to his workers for firewood if it will not be used in stabilisation of cleared areas.
- No spoil material may be dumped in the riparian areas.
- An alien plant eradication and management programme should be set up for the untransformed areas, drainage lines and riparian areas. Weed control measures should be implemented for several seasons, allowing indigenous pioneer species a chance to colonise the bare soil. Control of alien species must be done as per the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) Alien and Invasive Species Lists, 2014.

Socio-economic impacts

9.2.6 Aesthetic impact

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance After mitigation
Visual impact	Clearing	Local	Short	Low	Definite	Medium	Low
Visual impact	Operation	Local	Long	Low	Probable	Medium to Low	Low

The removal of ground cover will initially have an aesthetic impact locally until the orchard is established. The indigenous vegetation will be replaced with trees and it will not be a negative impact.

It is unlikely to have a significant visual impact on tourism related activities on the farm adjacent south or on the surrounding land users.

The impact is of a low significance.

No mitigation is proposed besides that the footprint for clearance must be demarcated and strictly controlled. No farming activities apart from the general maintenance road and alien plant control would be allowed outside the fenced areas.

9.2.7 Noise

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance After mitigation
Noise impact on surrounds	Clearing	Local	Short	Medium	Probable	Low	Very Low
Noise on surrounding area	Operation	Local	Long	Medium	Probable	Medium	Low

The clearing may result in short term noise but the operational period may result in continuous and phased noise impacts. Activities such as the spraying methods, harvesting and staff movement could result in noise.

The applicant must endeavour to manage activities in such a way that noise impacts are minimised as far as reasonably possible in order to minimise impacts on the nearest residents.

Impacts could be mitigated to be of lower significance.

It would not result in irreversible impacts or cumulative impacts for the immediate surrounds.

Proposed mitigation measures to lessen the noise impact and that could be applicable to both alternatives include:

- Operational activities that involve noisy machinery must preferably take place only during daytime hours only 6:00am to 18:00 pm and not on Sundays or public holidays.
- Should complaints be made that noise is a constant nuisance to neighbours the applicant must investigate noise reducing equipment. Steps must be taken to reduce noise levels to a level which is more acceptable and within allowable levels.

9.2.8 Traffic

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance After mitigation
Increase of traffic volumes	Clearing	Local	Short	Medium	Probable	Very Low	Very Low

Traffic related to the clearing of the vegetation will be for a short duration of time and cannot be mitigated. It is not expected to significantly delay the movement of everyday road users on the main road to the farm in this farming community.

Traffic during the operational period will be seasonal as the orchards must be managed and the harvested fruit would need to be transported to the pack house.

The impact is potentially of a very low significance. No mitigation is proposed.

9.2.9 Socio-economic impact

Nature of Impact	Period	Extent	Duration	Intensity	Probability	Significance before mitigation	Significance After mitigation
Socio-economic impact (+)	Clearing	Local	Short	Medium	High	High	High (+)
Social impact (-)	Clearing	Local	Long	Medium	High	Medium	Low

The farming of the arable areas on the farm will create a number of job opportunities which could uplift the local community.

The clearing activities will however be for a short duration of time and it is more likely that there will be a greater economic benefit during the cultivation and later on the harvesting. This is expected to be a regional impact.

The activity of clearing indigenous vegetation may have a negative social impact through the impacts on the natural biodiversity and resources if not monitored and managed.

Most of the negative impacts can be mitigated to be of a lower impact than before mitigation but as a result of the nature of the application, the impacts cannot be avoided.

No comments or concerns regarding social issues were raised apart from a request that the access to another farm portion over Portion 1 Boblands must remain. The access will not be affected.

10. Environmental Statement and Findings

Various potential environmental impacts were identified and considered in the EIA Report.

10.1 The key environmental impacts identified

- Water resources and aquatic ecology;
- Terrestrial ecology;
- Geology and soil conditions and
- Aesthetic impact

10.2 Primary positive and negative impacts

The following aspects pertain to both the application sites:

Positive aspects of the proposed activities:

- The sites under application are not pristine and have been disturbed in the past. Two of the areas proposed for cultivation are fallow land and the third site is not pristine natural woodland.
- Clearing is proposed to take place on areas that could be successfully cultivated.
- There is enough area available to cultivate the required 29,5 ha and ensure protection of the more sensitive drainage lines with associated riparian zones.
- Water is available for irrigation of the said areas. An irrigation consultant assisted in the calculations of the expected water requirements.
- The soil is suitable if the necessary recommendations are considered and implemented.
- The applicant is an experienced farmer and has appointed an agriculturist with a lot of experience in the field to assist with irrigation planning and other management aspects.
- The applicant is committed to farm and cultivate the application areas successfully. The clearance of vegetation will be monitored and managed.
- The potential impacts have been identified and can be successfully mitigated. Mitigation is easy and can be monitored.

Negative aspects of the proposed activities:

- The clearing of indigenous vegetation cannot be avoided and will result in a permanent loss of the indigenous vegetation on the sites cleared.
- If activities are not monitored and the orchard layout not planned out correctly, failed cultivation could result in long term impacts on the receiving environment. It is costly to layout an area of the proposed size and it is unlikely that the project will be abandoned by the applicant.
- Clearance may result in a loss of topsoil but also erosion into water resources if the activity and operation of the farm is not managed appropriately.

10.3 Assumptions and uncertainties

The environmental assessment practitioner accepts that the information contained in this report as provided by the applicant and professional consultants is true and accurate.

To make an assessment of the potential impacts the EAP took into account the findings of the specialists. The EAP also depends on the opinions and feedback from the Interested and Affected Parties and State Departments during the registration and commenting periods provided.

There are no major gaps in knowledge regarding the description of the current state of the environment including the potential impacts on water resources and other environmental aspects. All sensitive environments were identified by a specialist and appropriate mitigation measures were identified. The recommendations of the specialist study were incorporated into the assessment where applicable.

There is a high level of confidence that the most significant potential negative impacts for the proposed alternative can be appropriately minimised with the implementation of mitigation measures as proposed.

10.4 Indication of management and monitoring

An Environmental Management Programme (EMPr) has been compiled to ensure that the biophysical and social environments receive due consideration and that it is protected during the clearing of the areas applied for (Refer to Appendix 7 for the EMPr).

Apart from the EMPr it is proposed that the layout of the blocks and irrigation be done in consultation with an irrigation consultant.

The Environmental Management Programme (EMPr) was compiled to ensure that the biophysical and social environments receive due consideration and that it is protected during the undertaking of the activities.

The EMPr is a guideline document that will provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment. The measures prescribed must aim to result in a cautious approach being applied to on-site environmental management to ensure prevention, minimising and remediation of potential impacts.

11. Conclusion and Recommendations

No environmental fatal flaws were identified with the proposed clearance of the 29,5 hectares of indigenous vegetation.

A terrestrial biodiversity specialist assessment was undertaken to identify any conservation important species occurring and potentially occurring and to determine whether the proposed clearance would result in environmentally unacceptable impacts.

The comments received during the scoping period are addressed through the detail that is now available for comment in this EIR.

As confirmed by the agriculture and soil planning specialist and the other necessary ecological assessments it is the opinion of the EAP that the applicant will be able to successfully cultivate the proposed areas.

It is proposed that the clearing is considered and authorised for the indicated sections on Site 1, 2 and 3. It will form one management unit and will be most practical for the irrigation system layout.

The applicant will be able to manage the area in line with the applicable legislation whilst making every effort to minimise negative impacts on the natural and receiving environment.

The buffer proposed around the identified and mapped sensitive areas will be sufficient to protect these areas and it is wide enough for this buffer zone to fulfil the purpose it is proposed for.

Mitigation measures are proposed throughout the planning phase, the clearing and operational activities and it must be implemented to reduce and manage the potentially negative but also potentially cumulative impacts.

It is the recommendation of the EAP that if the application is considered favourably by the CA, the authorisation should be valid for a period of at least five years.

The applicant wishes to start planning the commencement of activities on the application properties in season and as soon as authorisation is received.

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