ENVIRONMENTAL CONSULTANTS INTERNATIONAL

SIX IN-STREAM STORAGE DAMS
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

THE PROPOSED CONSTRUCTION OF SIX IN-STREAM STORAGE DAMS AT LETABA ESTATES 525 LT AND PTN 0 BEACONSFIELD 530 LT, MOPANI DISTRICT, LIMPOPO PROVINCE

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12/1/9/2-M70

JANUARY 2023

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DRAFT ENVIRONMENTAL ASSESSMENT REPORT

LEDET Reference Number: 12/1/9/2-M70

Prepared for:

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Submitted to:

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REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENT & TOURISM

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Date: January 2023

ECI Project Code: A22037

EXECUTIVE SUMMARY

INTRODUCTION

Environmental Consultants International (Pty) Ltd (ECI) was appointed by the **African Realty Trust (Pty) Ltd** (ART) [Applicant]as Environmental Assessment Practitioner (EAP) for the proposed construction of six in-stream storage dams on various holdings of the Farm Letaba Estates 525 LT and Portion 0 of the Farm Beaconsfield 530 LT, Mopani District, Limpopo.

The extent of two properties is 1 900 hectares (ha) and 580 ha, respectively, and the proposed dams will have a collective footprint of approximately 51.08 ha.

The proposed development includes scheduled activities under the 2014 EIA Regulations in terms of National Environmental Management Act (Act 107 of 1998) [NEMA] resulting in the need for Environmental Authorisation (EA) from the Limpopo Department of Economic Development Environment and Tourism (LEDET).

A Scoping and Environmental Impact Reporting (S&EIR) process is followed in compliance with Sections 24(5) and 44 of the National Environmental Management Act (Act 107 of 1998) [NEMA]. The Scoping Phase for the proposed project has been completed and the Final Scoping Report (FSR), including the Plan of Study for the Environmental Impact Report (EIR), was approved by the LEDET on **13 October 2022**.

The Draft EIR is now available to registered Interested and Affected Parties (I&AP's) and State Departments for review and comment for a period of 30 calendar days, excluding the December Holiday period (therefore **from Monday, 9 January 2023 to Wednesday, 8 February 2023**). All comments received on the Draft EIR will be incorporated and addressed in the Final EIR which will be submitted to the LEDET for review and decision-making.

GENERAL PROJECT DESCRIPTION

The proposed project involves the construction of six in-stream stream storage dams for the storage of water for irrigation purposes at the Letaba Estates fresh fruit farm in order to augment the current storage volume.

Activities applied for under NEMA include **Government Notice Regulation (GNR) No. 327 (Listing Notice 1, Activities 12 and 19), GNR No. 325 (Listing Notice 2, Activity 15 and 16) and GNR 324 (Listing Notice 3, Activities 12 and 14).**

The proposed project also requires authorisation in terms of the National Water Act, 1998 (Act No. 36 of 1998) [NWA]. The project triggers the following activities in terms of Section 21 of the NWA:

- S21(b) Storing water;
- S21(c) Impeding or diverting the flow of water in a watercourse;
- S21(i) Altering the bed, banks, course or characteristics of a watercourse.

RISK AND KEY ISSUES

Risks and key impacts have been identified in consultation with the Interested and Affected Parties (I&AP's) and Stakeholders, during the notification phase. These impacts include:

Biophysical Impacts:

- Potential impacts on soil and ground and surface water quality that may occur as a result of the spillage of hydrocarbons and hazardous chemicals (during construction and operation);
- Potential impacts on soil and ground and surface water quality that may occur as a result of the generation of waste (during construction);
- Increased soil erosion as a result of vegetation clearance and increased stormwater runoff from hard surfaces (during construction and operation);
- Potential impacts on vegetation and loss of habitat (during construction);
- Potential impacts on the availability of surface water generated by run-off (during operation).

Socio-Economic Impacts:

- Impacts on ambient air quality dust and noise generation (during construction);
- Change in the visual character of the area (during construction and operation);
- Potential impacts on existing cultural and heritage resources (during construction);
- Potential impacts on traffic (during construction); and
- Economic development, job creation (during construction and operation);

Cumulative Impact:

- Incremental vegetation clearance and loss of habitat.

ALTERNATIVES

This report considers two Alternatives and the No-Go Alternative. If the Application is rejected, the No-Go Alternative will be adopted. The preferred alternative is Alternative 1.

Alternative 1: Six Dams (Preferred Alternative): This alternative consists of six in-stream dams to be constructed at various locations on various holdings of the Farm Letaba Estates 525 LT and Portion 0 of the Farm Beaconsfield 530 LT. The collective footprint of the dams will be **51.08 ha.**

Alternative 2: Five Dams: This alternative consists of five in-stream dams to be constructed at various locations on various holdings of the Farm Letaba Estates 525 LT. The collective footprint of the dams will be **35.59 ha.**

No-Go Alternative: This alternative relates to the status quo (i.e., what is likely to happen if the project is not authorised or does not proceed). The No-Go alternative provides the assessment with a baseline against which predicted impacts resulting from the proposed development may be compared.

IMPACT EVALUATION

Each issue identified will be evaluated in terms of the most important parameters applicable to environmental management. These include the nature, extent, duration, intensity, probability and significance of the possible impact on the environment. The impact assessment criteria used for this assessment is from DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

RECOMMENDED MANAGEMENT ACTIONS

A variety of mitigation measures have been identified that will serve to mitigate the scale, intensity, duration or significance of the impacts. These include guidelines to be applied during

the construction and operational phases of the project. A detailed Environmental Management Plan (EMPr) is included in the EIR (**Annexure H**).

CONCLUSION

In conclusion, the purpose of a Scoping & Environmental Impact Reporting (S&EIR) process is to evaluate the impact of the proposed development on the receiving biophysical and socio-economic environments and to propose mitigation measures that can reduce these impacts once implemented in the planning, construction as well as the operational phases. This ensures that the proposed project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

Although a number of potential short and long-term environmental and social impacts can be expected during the construction and operational phases of the proposed development of six in-stream storage dams, it was determined in the Draft EIR that the significance of these impacts could be reduced through the successful implementation of appropriate mitigation measures.

Comments and/or concerns identified by Interested and Affected Parties (I&APs) during the review period of the Draft EIR will be incorporated into the Final EIR for further investigation. The Final EIR phase will be submitted to the registered I&AP's for consideration and to LEDET for decision-making. All comments on the Final EIR will also be forwarded to the LEDET for consideration.

TABLE OF CONTENTS

ANNEXURES

- **Annexure A** – Maps
- **Annexure B** – Layout Plans
  - B.1 – Alternative 1 Layout Plan
  - B.2 – Alternative 2 – Layout Plan
- **Annexure C** – Site Photographs
- **Annexure D** – Engineering Services
- **Annexure E** – Public Participation
  - E.1 - Site Notices
  - E.2 - Newspaper Advert
  - E.3 - Written Notices
  - E.4 - Hand Deliveries
  - E.5 - Comments Received to date
  - E.6 - Comment and Response Report
  - E.7 - Registered I&AP Database
- **Annexure F** – Specialist Studies
  - F.1 – Viewshed Analysis
  - F.2 – Biodiversity Impact Assessment
  - F.3 – Aquatic Impact Assessment
  - F.4 – Phase 1 Heritage Impact Assessment
  - F.5 – Geotechnical Investigations
- **Annexure G** – Project Team CV'/ Qualifications / Registrations/ Declarations
  - G.1 – ECI Company Profile

- G.2 – EAP: Ms Hanlie Van Greunen
- G.3 – Ecologist: Mr Mokgatla Molepo
- G.4 – Heritage Specialist: Frans Roodt

- **Annexure H** – Environmental Management Programme

ACRONYMS

ART	African Realty Trust
CA	Competent Authority
CRR	Comments and Responses Report
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECI	Environmental Consultants International (Pty) Ltd
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EMZ	Environmental Management Zone
GNR	Government Notice Regulation
ha	Hectares
I&AP	Interested and Affected Party
IEM	Integrated Environmental Management
LEDET	Limpopo Department of Economic Development, Environment and Tourism
NEMA	National Environmental Management Act (Act No. 107 0f 1998)
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM: WA	National Environmental Management: Waste Act
NFEPA	National Freshwater Ecosystems Priority Areas
NHRA	The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	The National Water Act 1998 (Act No 36 of 1998)
PoS	Plan of Study
PPP	Public Participation Process
SDF	Spatial Development Framework
S&EIR	Scoping & Environmental Impact Reporting
Sqm	Square Metres
WULA	Water Use License Application

1. INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Environmental Consultants International (Pty) Ltd (ECI) was appointed by the **African Realty Trust (Pty) Ltd** (ART) [Applicant] as the Environmental Assessment Practitioner (EAP) for the proposed construction of six in-stream storage dams at Letaba Estates 525 LT and Portion 0 of the Farm Beaconsfield 530 LT, Mopani District, Limpopo. Refer to **Figure 1.**

The extent of two properties is 1 900 ha and 580 ha, respectively, and the proposed dams will have a collective footprint of approximately 51.08 ha.

Production of fresh fruit in the receiving environment dates back to 1902 and used to consist of a number of smaller growers which were incorporated over the years into the Letaba Estates Fresh Fruit Farm as it exists today.

Letaba Citrus Processors (LCP) [now incorporated in ART], was established in 1961 and is an advanced facility able to extract, process and blend concentrated fruit juice, pulps and purees from fresh fruit harvested at the Letaba Estates Fresh Fruit Farm.

With approximately 100 years' experience the operation manages and produces 65,000 tons of citrus annually, supplying local and global markets with quality fruit produce.

The processing plant can process close to 100,000 tons off fresh fruit, by combining sophisticated processing technology with high-quality ingredients to formulate frozen aseptic and preserved fruit juice and vegetable products for local and export markets.

The proposed dams will form part of the existing irrigation network, fed by the Letaba North irrigation canal, with its source being the Letaba River located directly south of the relevant properties.

The Letaba North irrigation canal is managed by the Letaba Water User Association (LWUA) and is utilised for irrigation of a variety fresh fruit along the banks of the Letaba River throughout the area. It is the intent of the Applicant to augment the current storage volume of the farm in order to store and utilise their full water allocation from the canal.

Figure 1: Location of the proposed six dams

1.2 ENVIRONMENTAL AUTHORISATION IN SOUTH AFRICA

The purpose of a Scoping & Environmental Impact Reporting (S&EIR) process is to evaluate the impact of the proposed development on the receiving biophysical and social environments and to propose mitigation measures that can reduce these impacts once implemented in the planning, construction as well as the operational phases.

Environmental Impact Assessment (EIA) is intended to be a systematic and consultative process that gathers comprehensive and detailed information on the social, economic and environmental consequences of proposed developments. The relevant competent authority, in this case LEDET, uses this information to make an informed decision on development applications that maximises socio-economic outcomes, whilst ensuring the continuance or improvement of ecological function. The objective for an EIA, therefore, is to promote sustainable development through effective management of social, economic and environmental impacts, so that:

- Valuable environmental resources are safeguarded by avoiding negative irreversible changes to the environment;
- Human health and safety are protected; and
- The social and economic benefits of the proposed development is enhanced.

The proposed development includes scheduled activities under the 2014 EIA Regulations resulting in the need for Environmental Authorisation (EA) from the LEDET. Proposed activities listed in terms of National Water Act, 1998 (Act 37 of 1998) (NWA) will require a Water Use Licence to be administered by the Department of Water and Sanitation (DWS).

1.3 SCOPING PHASE

During the Scoping phase all available information concerning the intended project and the receiving environment is gathered and subjected to a preliminary risk and impact assessment.

Interested and Affected parties (I&APs) are informed about the proposed project and their comments on issues of concern about these are invited. An important output from the information evaluation and consultation with I&APs will be a clear understanding of the key issues that must be further addressed in the EIA phase. The Scoping phase therefore determines the terms of reference for any specialist studies required during the EIA phase to follow.

The Letaba Estates Six Dams Final Scoping Report (FSR), including the Plan of Study for the Environmental Impact Report (EIR), was approved by the LEDET on **13 October 2022**.

1.4 EIA PHASE

An Environmental Impact Assessment (EIA) is an effective environmental planning tool. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The eight guiding principles that govern the entire process of EIA are as follows (see **Figure 2** below):

- **Participation:** An appropriate and timely access to the process for all interested parties.
- **Transparency:** All assessment decisions and their basis should be open and accessible.
- **Certainty**: The process and timing of the assessment should be agreed in advance and followed by all participants.
- **Accountability:** The decision-makers are responsible to all parties for their action and decisions under the assessment process.
- **Credibility:** Assessment is undertaken with professionalism and objectivity.
- **Cost-effectiveness:** The assessment process and its outcomes will ensure environmental protection at the least cost to the society.
- **Flexibility:** The assessment process should be able to adapt to deal efficiently with any proposal and decision-making situation.
- **Practicality:** The information and outputs provided by the assessment process are readily usable in decision-making and planning.

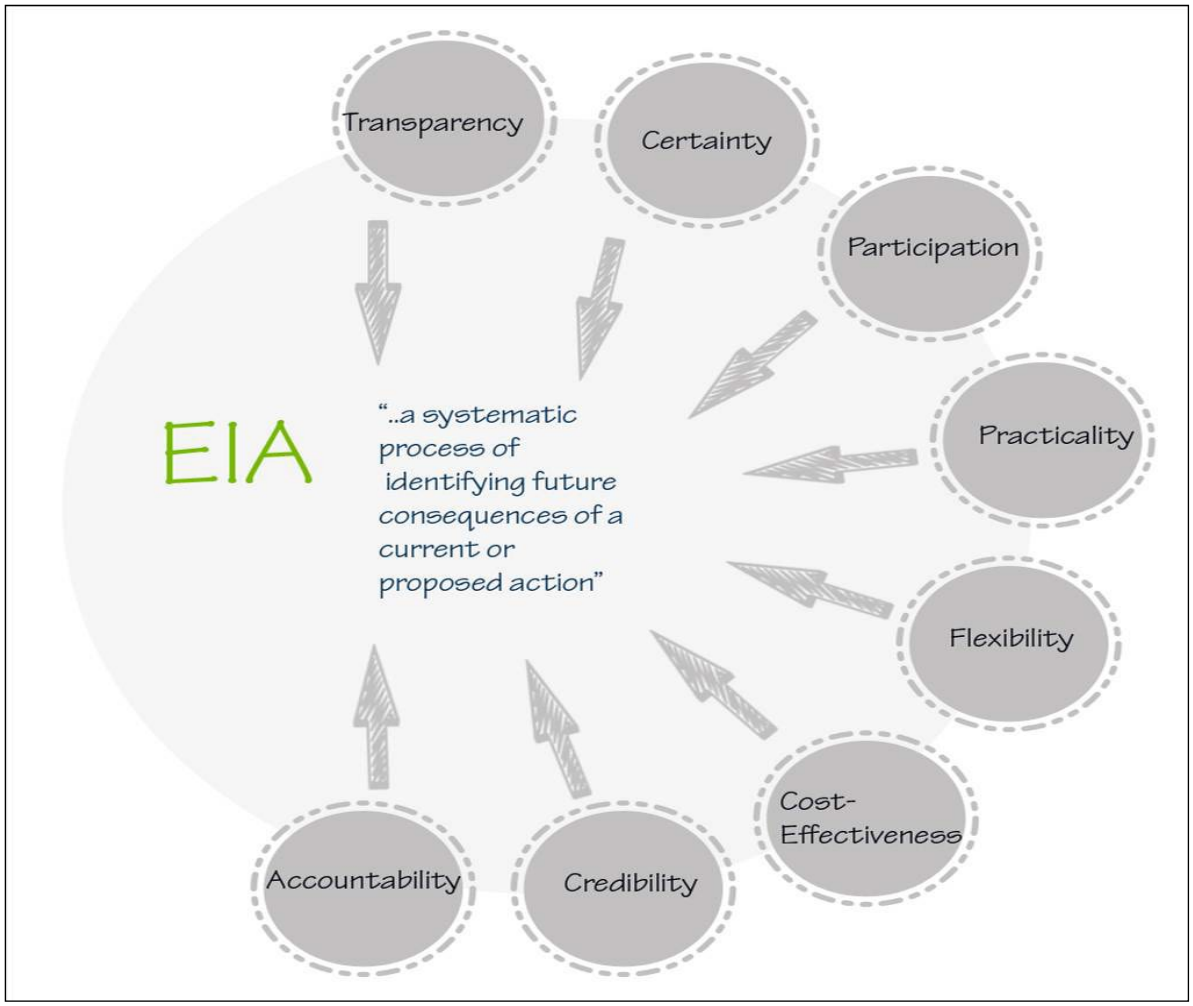

Figure 2: EIA Guiding Principles

1.4.1 NATURE AND STRUCTURE OF THIS REPORT

This report fulfils the requirements of Appendix 2 of GNR 326 of the 2014 EIA Regulations (as amended April 2017), which clearly specifies the required content of an Environmental Impact Assessment Report as summarised in **Table 1** below:

Table 1: GNR 326 Appendix 2: Environmental Impact Assessment Reporting Requirements

No.	Requirement	Reference
1 (1)	The environmental impact assessment process must be undertaken in line with the approved plan of study for environmental impact assessment.	Section 7, 8 & 9
1 (2)	The environmental impacts, mitigation and closure outcomes as well as the residual risks of the proposed activity must be set out in the environmental impact assessment report.	Section 7, 8 & 9
2	The objective of the environmental impact assessment process is to, through a consultative process—	Section 1 & 5

No.	Requirement	Reference
2 (a)	determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;	Section 3
2 (b)	describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;	Section 4
2 (c)	identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;	Section 2
2 (d)	determine the (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and (ii) degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated;	Section 7, 8 & 9
2 (e)	identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;	Section 11
2 (f)	identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;	Section 9 & 11
2 (g)	Identify suitable measures to avoid, manage or mitigate identified impacts;	Section 9
2 (h)	identify residual risks that need to be managed and monitored.	Section 9
3(1)(a)	details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.6
3 (1)(b)	the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i and (ii) is not available, the coordinates of the boundary of the property or properties	Section 2
3(1)(c)	a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;	Section 2: Figures 4 and 5

No.	Requirement	Reference
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	
3(1)(d)	a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associate structures and infrastructure related to the development;	Section 2
3(e)	a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 3
3(f)	a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Section 4
3(g)	a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Section 11
3(h)	a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (i) details of the development footprint alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; the possible mitigation measures that could be applied and level of residual risk;	Section 2 Section 5 and Annexure E Section 6 Section 7, 8 & 9 Section 8 Section 9

No.	Requirement	Reference
	(viii) if no alternative development footprints for the activity were investigated, the motivation for not considering such; and (ix) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;	Section 11
3(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 8 Section 9
3(j)	an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and the (vii) degree to which the impact and risk can be mitigated;	Section 9
3(k)	where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Section 6
3(l)	an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment: (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 11
3(m)	based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for	Annexure F Annexure H

No.	Requirement	Reference
	inclusion in the EMPr as well as for inclusion as conditions of authorisation;	
3(n)	the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 11
3(o)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 11
3(p)	a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.7
3(q)	a reasoned opinion as to whether the proposed activity should or should be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 11
3(r)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	N/A
3(s)	an undertaking under oath or affirmation by the EAP in relation to – (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Application Form Annexure E Annexure F Annexure H
3(t)	where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
3(u)	an indication of any deviation from the approved scoping report, including the plan of study, including─ (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	N/A
3(v)	any specific information that may be required by the competent authority;	To be included in the final EIR.
3(w)	any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A
	Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.	N/A

1.5 SPECIALIST STUDIES

The following specialist studies have been conducted with the aim of identifying the environmental constraints posed by the site at an early stage and to adjust the project proposal to accommodate the constraints and maximise opportunities (Refer to **Annexure F**):

- Biodiversity Impact Assessment
- Aquatic Impact Assessment
- Phase 1 Heritage Impact Assessment
- Geotechnical Investigations

Details of the EAP and Specialist Team are included in Section 1.6.

1.6 DETAILS AND EXPERTISE OF STUDY TEAM

1.6.1 EXPERTISE OF THE COMPANY

The consultants of ECI have been providing environmental management services in the following areas since 1991:

- Strategic Assessment and Planning
- Landscape Architecture
- Land Management Plans
- Environmental and Social Impact Assessment
- Licensing Applications
- Biodiversity Assessments Tables
- Monitoring and Auditing
- Public Consultation and Stakeholder Engagement
- Peer Reviews
- Environmental Advisory Services

Refer to **Annexure G** for ECI's Company Portfolio.

1.6.2 EXPERTISE OF EAP

Refer to **Annexure G** for CV's and Qualifications of the EAP. A brief summary follows:

EAP: Ms Hanlie Van Greunen

Hanlie Van Greunen has a BSc degree in Landscape Architecture and a BSc Honours degree in Environmental Monitoring and Modelling and is a member of the International Association for Impact Assessment of South Africa (IAIAsa Member 6657) as well as a Registered Member of EAPASA (Reg no 2019/1008). With 18 years' experience in the environmental industry her key performance areas include Environmental Licensing, Public Participation, Environmental Compliance Auditing, Visual Impact Assessment and Project Management.

1.6.3 EXPERTISE OF THE SPECIALIST TEAM

Refer to **Annexure G** for CV's and Qualifications of the Specialist Team. A brief summary follows:

Ecological and Wetland Specialist: Mr Mokgatla Molepo

Mokgatla obtained his MSc Zoology at the Nelson Mandela University (Percy FitzPatrick Institute of African Ornithology Centre of Excellence) and his BSc Honours in Zoology at the University of Limpopo as well as his BSc Botany & Zoology, University of Venda. Mokgatla has 7 year's professional experience and is a SACNASP Professional natural scientist in the field of Zoological Science as well as a SACNASP Professional Natural scientist in the field of Ecological Science (Reg No. 009509). Mokgatla is also registered with British Ecological Society (BES) as well as the Zoological Society of Southern Africa (ZSSA).

Heritage Specialist: Mr Frans Roodt

Frans has a MA degree in Archaeology and a Post Grad Diploma in Museology. With 26 years of experience in the Heritage field Frans's key experience is in Section 38 and 34 Heritage Impact Assessment Applications.

1.7 ASSUMPTIONS AND LIMITATIONS

1.7.1 ECOLOGICAL ASSESSMENT

The following assumptions and limitations are applicable to this ecological assessment:

- The findings, results, observations, conclusions and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as

available information regarding the potential impacts of construction of in-stream dams on the vegetation composition.

- The assessment of impacts was based on the current state of the primary environment currently.
- MORA Ecological Services (Pty) Ltd relied on ECI, as the EAP, to supply correct information on the site locality and extent, as well as project details which were assumed to be correct.
- It was assumed that the information contained in existing databases, reports and publications is correct.

MORA reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light.

1.7.2 AQUATIC IMPACT ASSESSMENT

Studies relating to natural ecosystems and understanding historical conditions rely on various assumptions, with the following assumptions being made during the assessment of these particular wetland and riparian systems:

- The final development layout would remain within the indicated proposed development footprint.
- The development footprint provided was accurate.
- Appropriate designs are in place to deal with the potential impacts.

The following limitations apply to the studies undertaken for this report:

- Due to time and budgetary constraints, wetland and riparian areas were delineated at a desktop level and were then verified infield.
- The original assessments were done in October 2022. Wetland and riparian vegetation were in a moderately good condition for identification.
- Riparian and wetland areas were assessed within the 50m, 100m and 500m buffer of the footprint area as per the original TOR.
- The determination of risk was confined by the choices available within the risk assessment matrix as per appendix A of Government notice 509 of 2016.

1.7.3 HERITAGE AND PALAEONTOLOGICAL INVESTIGATION ASSESSMENT

The heritage survey was thorough, but limitations were experienced due to the fact that archaeological sites are subterranean and only visible when disturbed. Vegetation was moderate to extremely dense as survey was conducted during the height of the rain season.

2. PROJECT DESCRIPTION

2.1 LOCATION

The proposed project is located at various holdings of the Farm Letaba Estates 525 LT and Portion 0 of the Farm Beaconsfield 530 LT, within Greater Tzaneen Local Municipality of Mopani District, Limpopo. Refer to **Figure 1: Location Map** (an A3-sized copy is attached as **Annexure A**).

The proposed site can be reached by travelling east on the R71 from Tzaneen Lifestyle Centre towards Tarentaalrand for 16.5 kilometres (km). Once at the Tarentaalrand 4-way stop, turn right (south) towards Nkowankowa and continue for 5.7 km towards the Letaba Estates main entrance gate on the lefthand side of the road. The altitude of the site is at around 555m above sea level. The GPS coordinates for each proposed dam site are recorded in **Table 2** and the affected cadastral land parcels are recorded in **Table 3 and Table 4**.

Table 2: GPS Coordinates of the dam sites

Dam	Latitude	Longitude
Dam 1	23°51'49.83"S	30°19'02.14"E
Dam 2	23°51'39.52"S	30°19'50.93"E
Dam 3	23°51'51.27"S	30°19'41.54"E
Dam 4	23°52'26.54"S	30°19'37.33"E
Dam 5	23°52'14.59"S	30°20'39.09"E
Dam 6	23°50'10.26"S	30°15'10.94"E

Table 3: 21-digit Surveyor General codes

Affected cadastral land parcels	21-digit Surveyor General code
Letaba Estates 525 LT	T0LT00000000052500000
Ptn 0 Beaconsfield 530 LT	T0LT00000000053000000

Table 4: Holdings of the proposed dam sites within Letaba Estates

Dam	Holding	Surface Area
Dam 1	Holding 373 Letaba Estates 525 LT	4.88ha
Dam 2	Holding 610 Letaba Estates 525 LT	5.36ha
Dam 3	Holding 578 Letaba Estates 525 LT	4.4ha
Dam 4	Holding 598 Letaba Estates 525 LT	6.15ha
Dam 5	Holding 747 Letaba Estates 525 LT	15.10ha
Dam 6	Ptn 0 Beaconsfield 530 LT	15.49ha

2.2 LAND USE

The study area consists mostly of cultivated land in the form of irrigated citrus orchards. Bushveld vegetation occurs along the sides and foot slopes of the elevated areas in the north of the study area. The non-perennial tributaries are dominated by moderate to dense riparian vegetation.

The area is currently zoned as 'Agriculture'. The land uses surrounding the application properties are mostly Residential and Agricultural. Residential use to the south of the application properties includes the villages of Nkowankowa, Mariveni, Ka-Mayomela and Ga-Maimela and Letaba Hospital is located south west of the application site. Refer to **Figure 3: Site Photographs.**



Dam site 1



Dam site 2



Dam site 3



Dam site 4



Dam site 5



Dam site 6

Figure 3: Site Photos

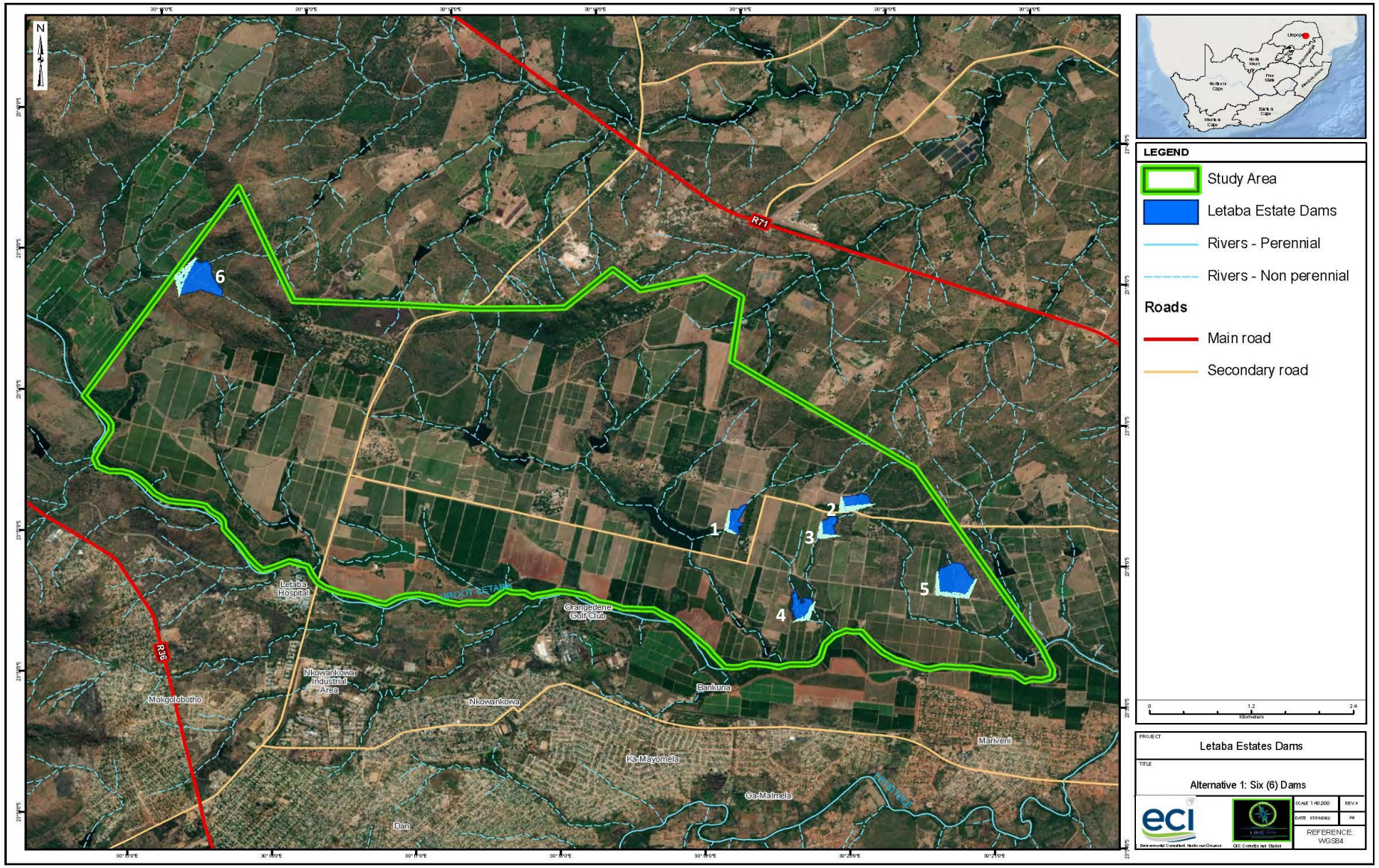

Figure 4: Alternative 1: Six Dams (Preferred Alternative)

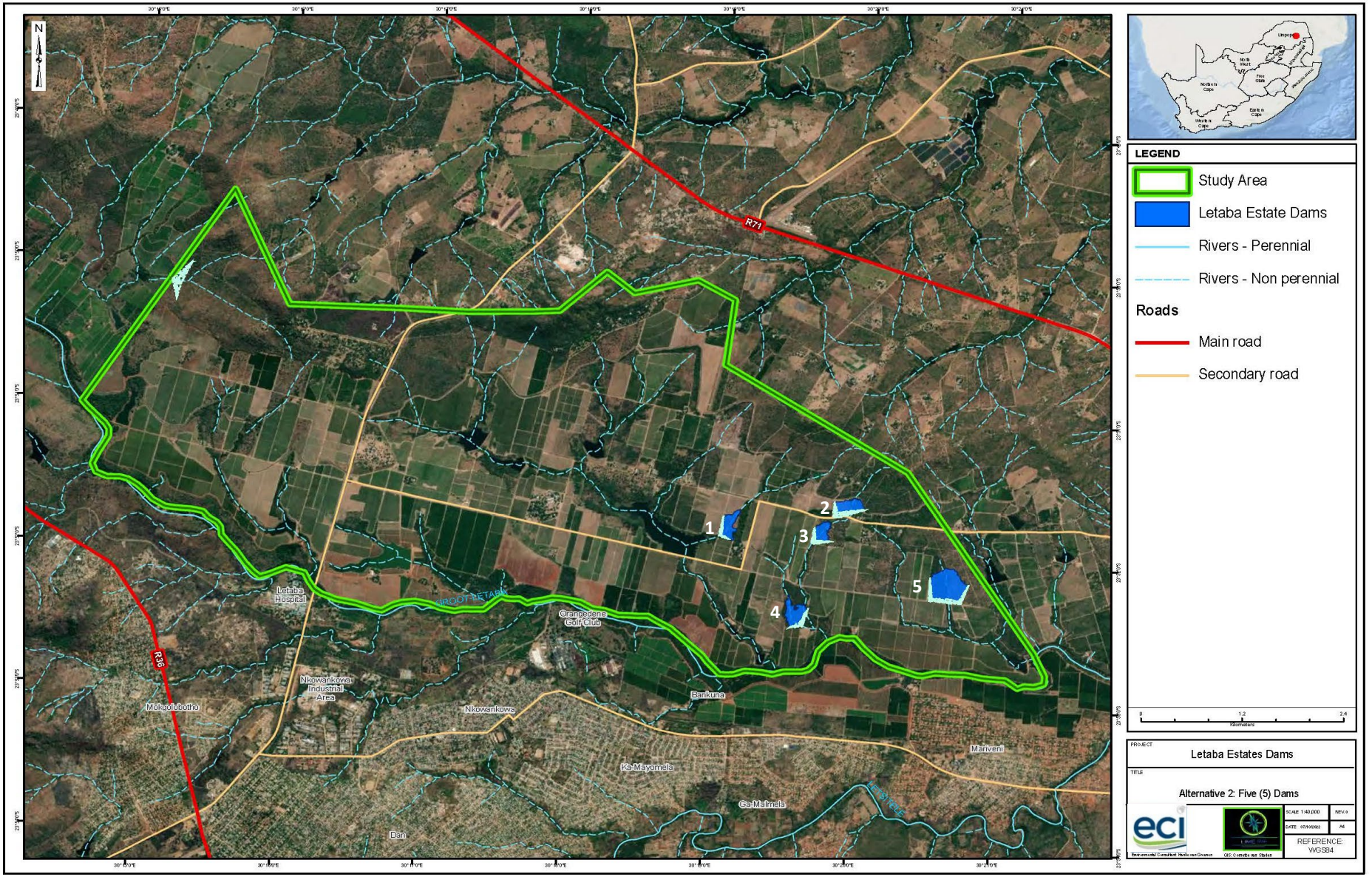

Figure 5: Alternative 2: Five Dams

2.3 ALTERNATIVES

One of the objectives of an EIA is to investigate alternatives to the proposed project. The EIA Regulations 2014 define alternatives as:

"different means of meeting the general purpose and requirements of the activity, which may include alternatives to; -

a) *the property on which or location where it is proposed to undertake the activity;*
b) *the type of activity to be undertaken;*
c) *the design or layout of the activity;*
d) *technology to be used in the activity; or*
e) *operational aspects of the activity"*

All proposed alternatives must be both reasonable and feasible.

One Alternative (known as Alternative 2) were identified during the Scoping Phase and were assessed during the EIA Phase together with the Proposed Activity (known as Alternative 1) as well as the No-Go Alternative. A summary of each alternative is outlined below.

2.3.1 ALTERNATIVE 1: SIX DAMS (PREFERRED ALTERNATIVE)

Alternative 1 is the preferred alternative and consist of six in-stream storage dams, with a collective footprint of approximately **51.08 hectares (ha),** which is intended to augment the farms current water storage capacity. The proposed dams will be located at various holdings of the Farm Letaba Estates 525 LT and Portion 0 of the Farm Beaconsfield 530 LT.

The dams will form part of the existing irrigation network, fed by the Letaba North irrigation canal, with its source being the Letaba River located directly south of the relevant properties.

Alternative 1 is the Preferred Alternative as the water storage capacity of the farm will be maximised and irrigation of the citrus orchards will be able to continue uninterruptedly during the dry season. The Applicant will therefore be able to utilise a higher percentage of water allocated to them from the Letaba Water User Association (LWUA) instead of water just flowing downstream along the canal.

Refer to **Figure 4** for the Layout Plan of Alternative 1: Six Dams (Preferred Alternative).

2.3.2 ALTERNATIVE 2: FIVE DAMS

Alternative 2 is very similar to Alternative 1, however, this Alternative excludes Dam 6 which is located at Portion 0 of the Farm Beaconsfield 530 LT. As a result, Alternative 2 will consist of five dams which will be constructed at various holdings of the Farm Letaba Estates 525 LT. The collective footprint of the five dams will be **35.59 ha.**

Similarly, as with Alternative 1, the proposed five dams will be used for the storing of water for irrigation purposes. The dams will form part of the existing irrigation network, fed by the Letaba North irrigation canal, with its source being the Letaba River located directly south of the relevant properties.

Refer to **Figure 5** for the Layout Plan of Alternative 2: Five Dams

2.3.3 NO-GO ALTERNATIVE

The No-Go Alternative relates to the status quo (i.e., what is likely to happen if the project is not authorised or does not proceed). The No-Go alternative provides the assessment with a baseline against which predicted impacts resulting from the proposed development may be compared. If the project does not proceed the Water Storage shortage on the farm will remain unaddressed.

2.4 DAM SITES

PG Consulting Engineers were appointed by ART to identify and evaluate possible dam sites for additional irrigation storage on the farms Letaba Estates 525 LT and Beaconsfield 530 LT, Mopani District, Limpopo Province, by means of a desktop study. The desktop study was based on Lidar survey data received from Groenhoek Besproeiing (Pty) Ltd.

Initially seven (7) possible dam sites were identified by the applicant for the placement of storage dams. PG Consulting refined the identified dam positions and investigated the maximum storage volume at each dam site based on the limitations placed by the topography and surrounding orchard developments. After the investigation it was determined that the original Dam six is impractical and not feasible, please refer to the engineering report attached as **Annexure D**. As the original dam 6 was impractical and not feasible, the number of dams was automatically reduced to six (6) and dam seven in the engineering report became the sixth dam, as referred to in this report.

2.4.1 DAM SITE 1

Dam 1 (co-ordinates: 23°51'49.83"S; 30°19'02.14"E) is located on Holding 373 of Letaba Estates 525 LT. The dam is designed to have a maximum wall height of 6m which will create a Gross Storage Capacity of 106 077m^3 and a surface area of 4.88ha. The required earthfill volume for the construction of the dam wall is calculated at 15 070m^3. Please refer to **Figure 6** below for an illustration of Dam 1.

2.4.2 DAM SITE 2

Dam 2 (co-ordinates: 23°51'39.52"S; 30°19'50.93"E) is located on Holding 610 of Letaba Estates 525 LT. The dam is designed to have a maximum wall height of 13m which will create a Gross Storage Capacity of 243 474m^3 and a surface area of 5.36ha. The required earthfill volume for the construction of the dam wall is calculated at 96 510m^3. Please refer to **Figure 7** below for an illustration of Dam 2.

2.4.3 DAM SITE 3

Dam 3 (co-ordinates of 23°51'51.27"S; 30°19'41.54"E) is located on Holding 578 of Letaba Estates 525 LT. The dam is designed to have a maximum wall height of 11m which will create a Gross Storage Capacity of 162 423m^3 and a surface area of 4.15ha. The required earthfill volume for the construction of the dam wall is calculated at 40 635m^3. Please refer to **Figure 8** below for an illustration of Dam 3.

2.4.4 DAM SITE 4

Dam 4 (co-ordinates: 23°52'26.54"S; 30°19'37.33"E) is located on Holding 598 of Letaba Estates 525 LT. The dam is designed to have a maximum wall height of 11m which will create a Gross Storage Capacity of 176 800m^3 and a surface area of 6.15ha. The required earthfill volume for the construction of the dam wall is calculated at 35 735m^3. Please refer to **Figure 9** below for an illustration of Dam 4.

2.4.5 DAM SITE 5

Dam 5 (co-ordinates: 23°52'14.59"S; 30°20'39.09"E) is located on Holding 747 of Letaba Estates 525 LT. The dam is designed to have a maximum wall height of 11m which will create a Gross Storage Capacity of 243 474m^3 and a surface area of 4.88ha. The required earthfill volume for the construction of the dam wall is calculated at 102 175m^3. Please refer to **Figure 10** below for an illustration of Dam 5.

2.4.6 DAM SITE 6

Dam site 6 (initially Dam 7 in the engineering report) (co-ordinates: 23°50'10.26"S; 30°15'10.94"E) is located on Portion 0 of the Farm Beaconsfield 530 LT. The dam is designed to have a maximum wall height of 22m which will create a Gross Storage Capacity of 1 263 314m^3 and a surface area of 15.49ha. The required earthfill volume for the construction of the dam wall is calculated at 242 987m^3. Please refer to **Figure 11** below for an illustration of Dam 6.

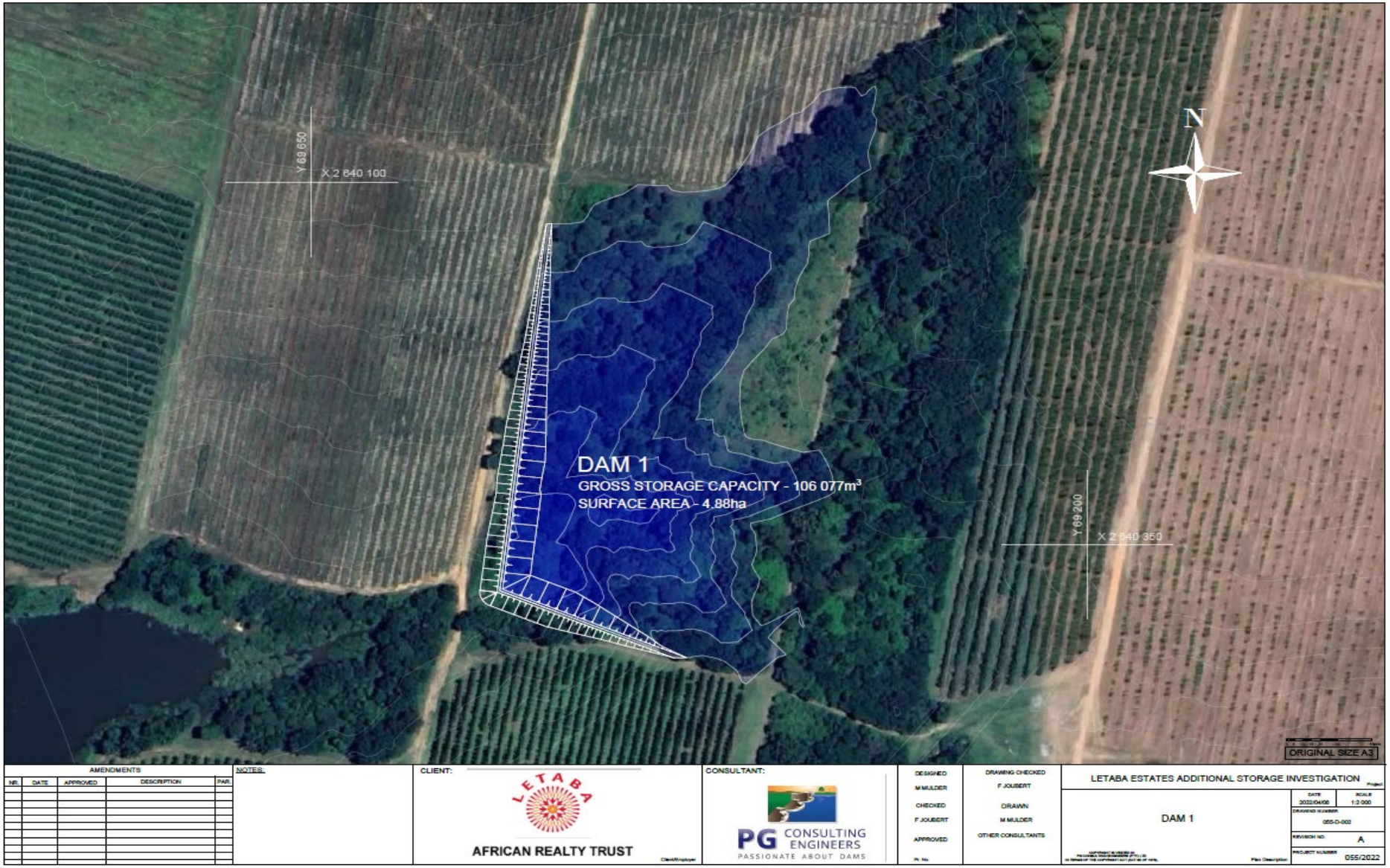

Figure 6: Design Drawing of Dam 1

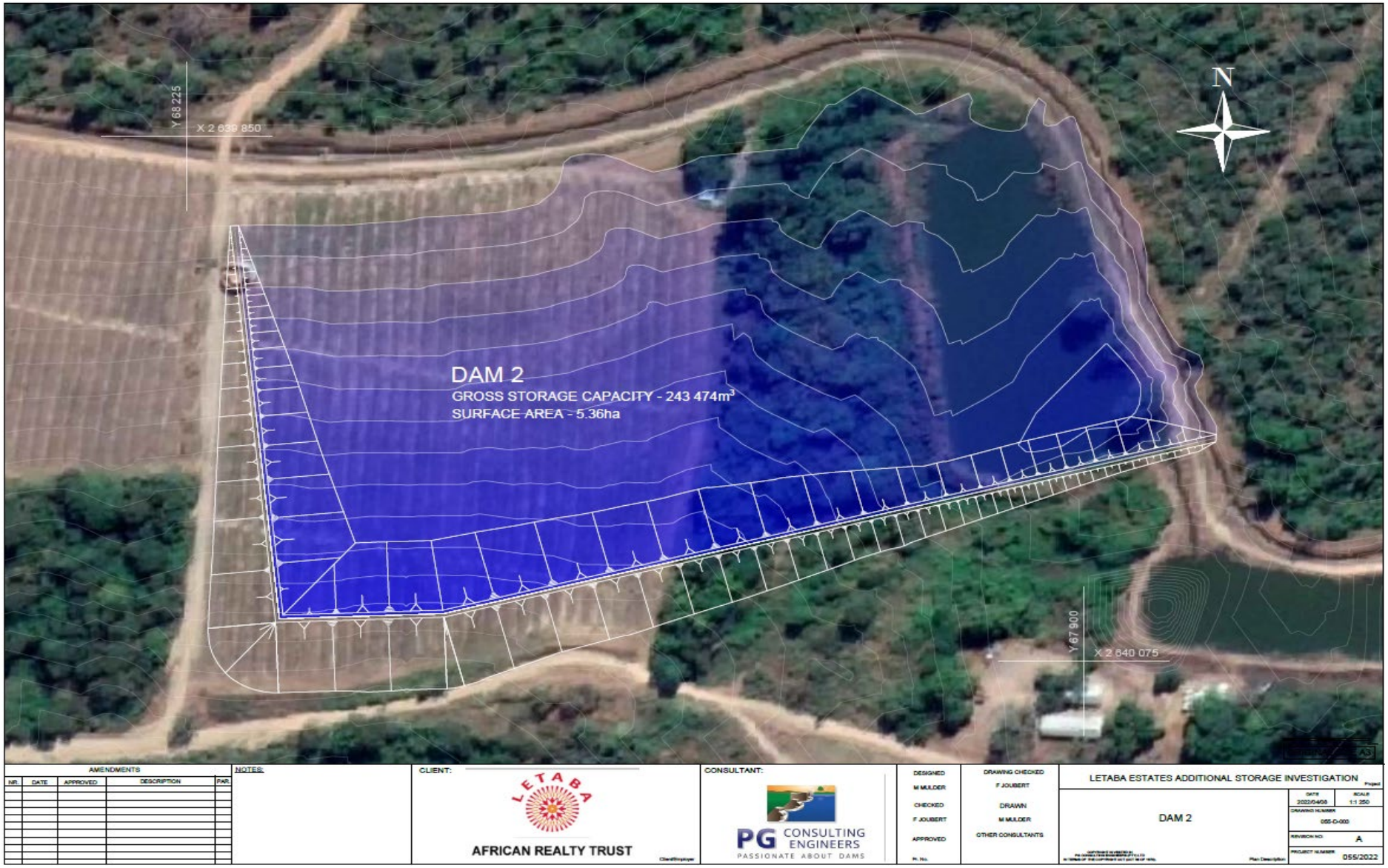

Figure 7: Design Drawing of Dam 2

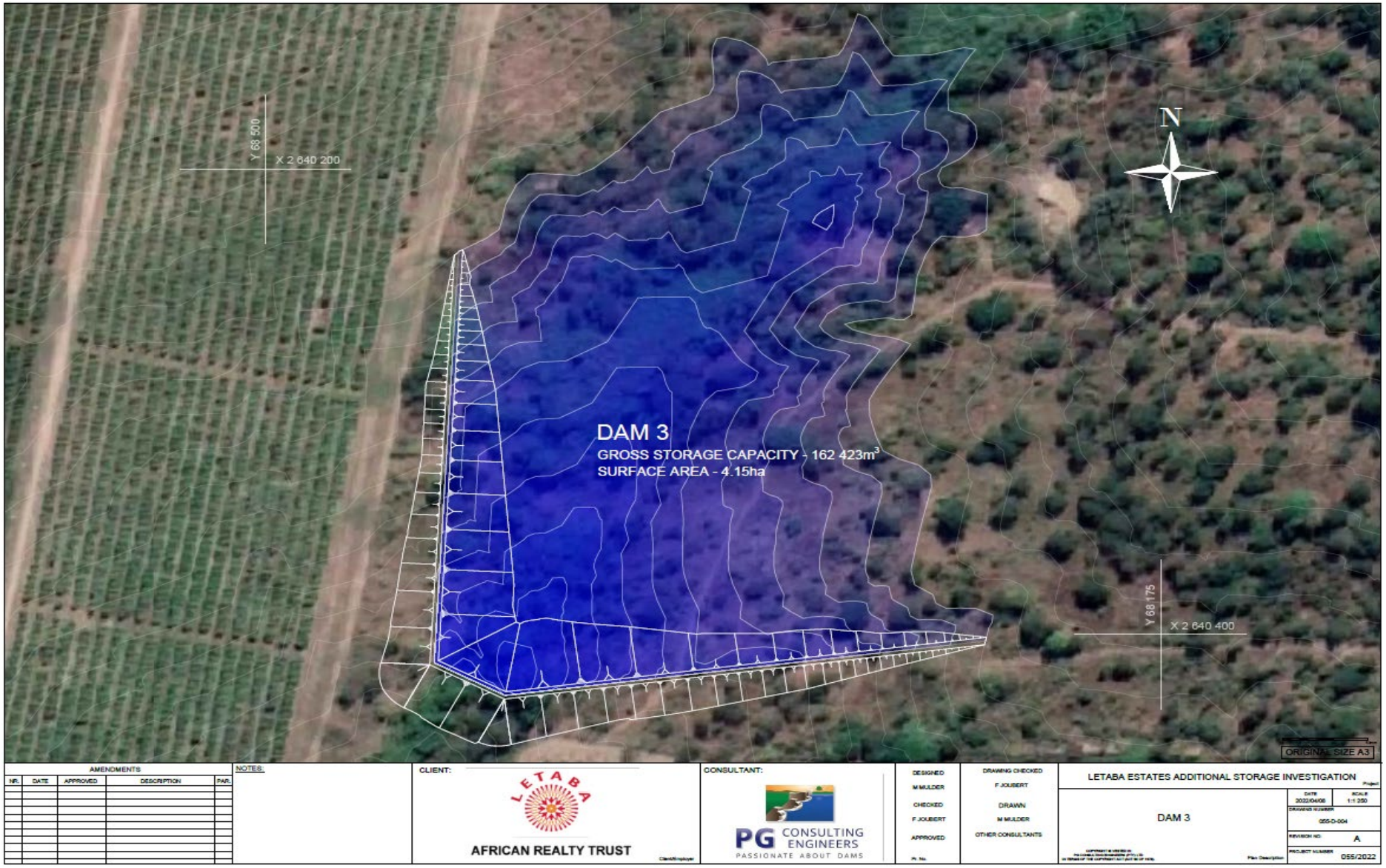

Figure 8: Design Drawing of Dam 3

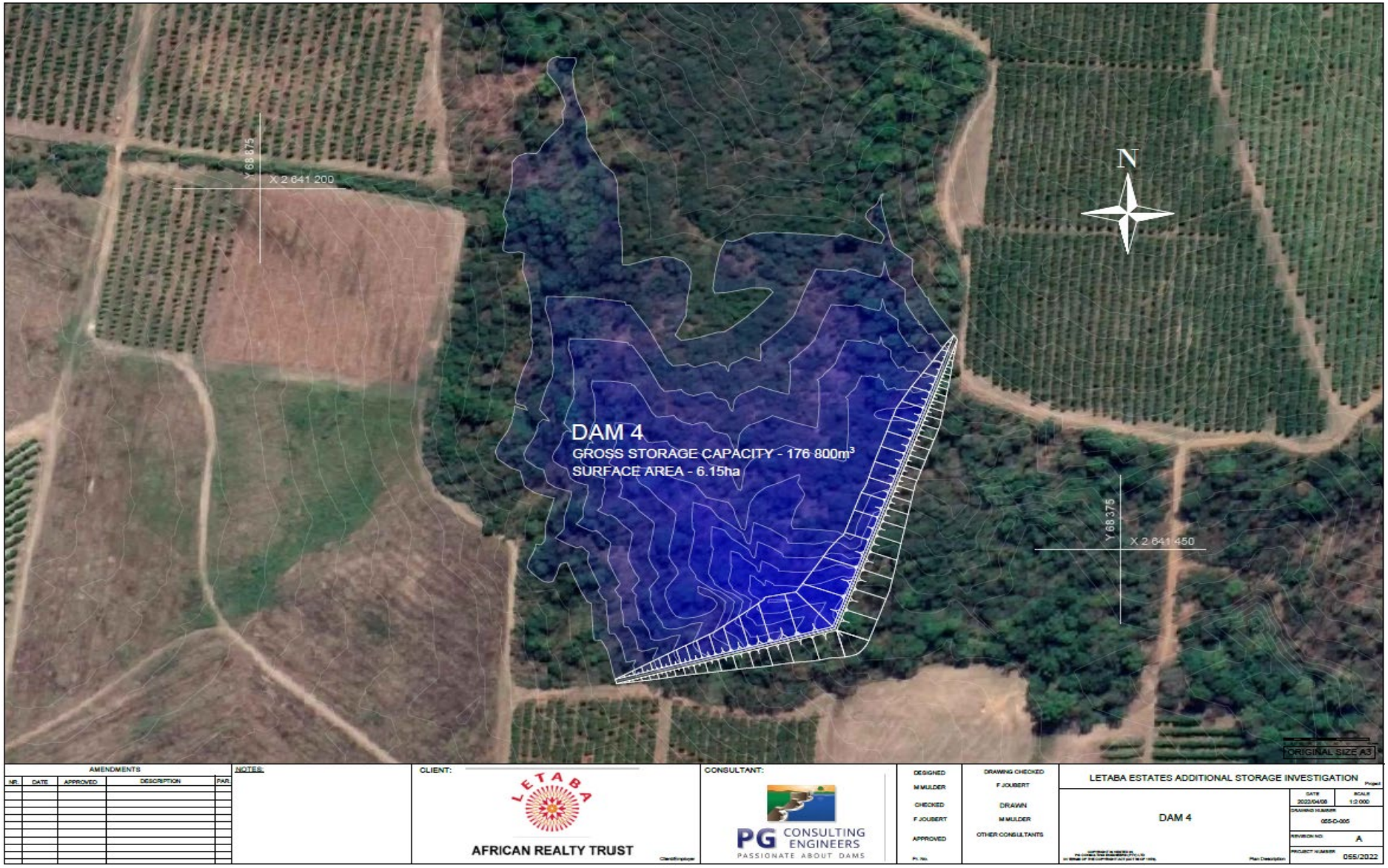

Figure 9: Design Drawing of Dam 4

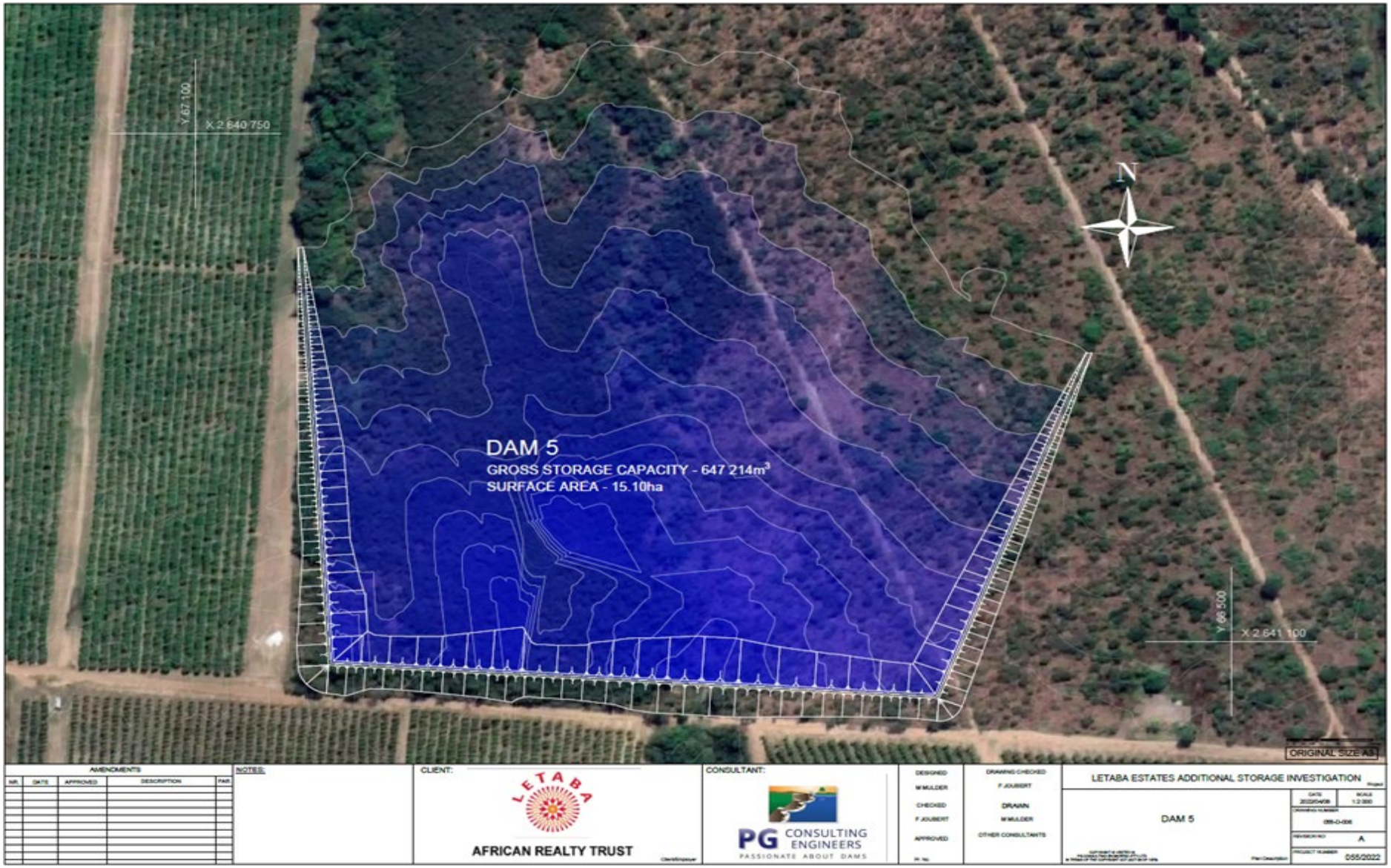

Figure 10: Design Drawing of Dam 5

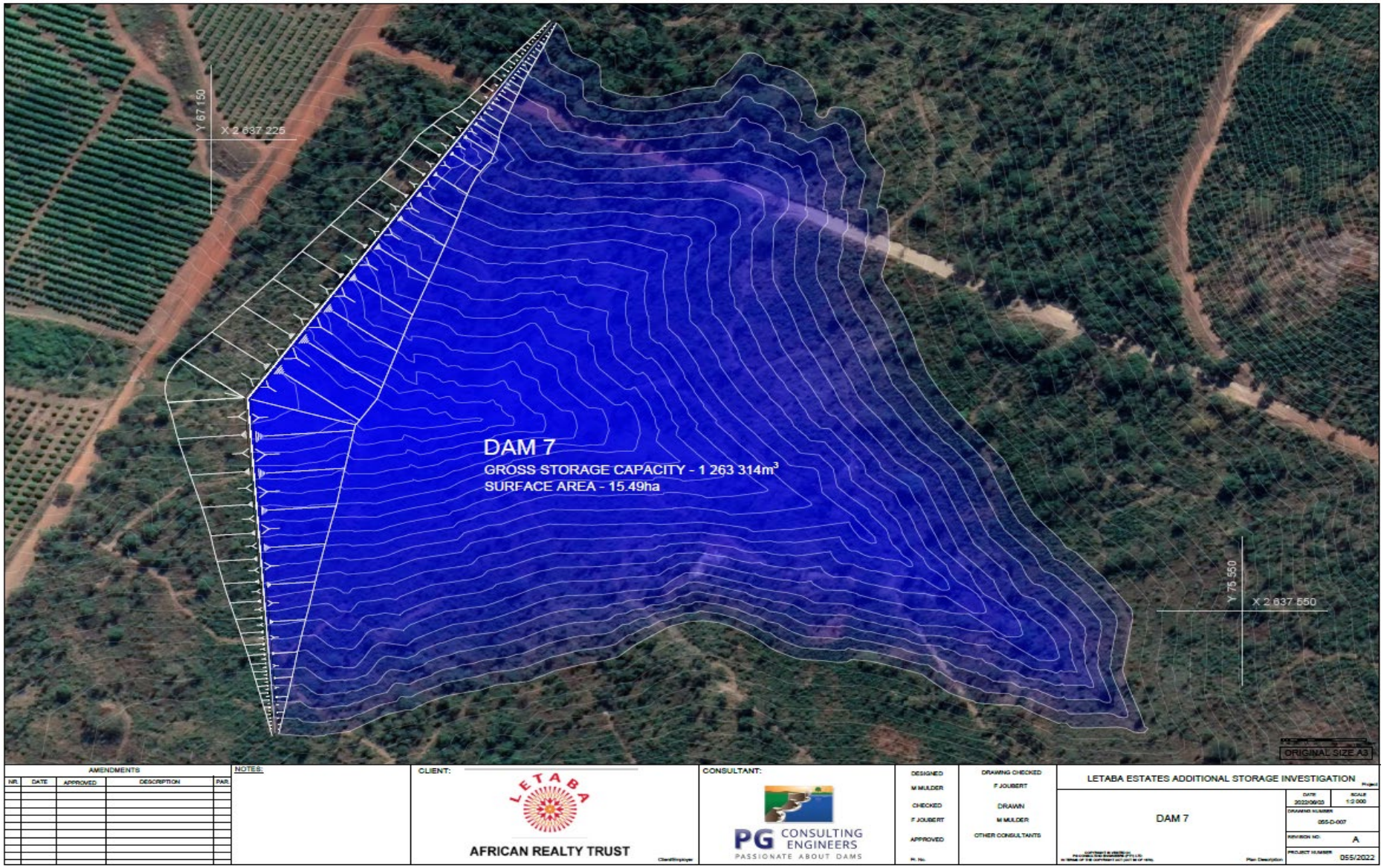

Figure 11: Design Drawing of Dam 6 (previously known as Dam 7 in Engineering Report)

2.5 SERVICES

2.5.1 ELECTRICITY

Electricity to pump water from the irrigation canal to the various dams will be sourced from an authorised 2.49-megawatt solar plant that is in the process of being constructed. Solar energy will be fed into an existing private sub-station via a series of inverters. Electricity will be distributed utilising the existing internal “off-grid” electrical infrastructure across the farm in order to supply uninterrupted power to agricultural activities during periods of load shedding and electricity outages.

2.5.2 WATER

The water used on the farm is currently obtained from the Letaba North irrigation canal which is managed by the Letaba Water Association (LWUA) and no additional abstraction of surface or groundwater will be applied for. Water to feed the proposed dams will be obtained from the ART’s annual bulk water allocation (16 402 988m^3) as assigned to the following properties:

- Beaconsfield 530 LT (Die Plaas);
- Letabadrift 526 LT (Remaining Portion);
- Letabadrift 526 LT (Remaining Portion of Portion 1); and
- Letaba Estates 525 LT (Letaba Estates Landbouhoewes);

Refer to **Annexure D** for ART’s Abstraction Certificates as issued by the LWUA.

2.5.3 SOLID WASTE

Solid waste will be generated on site during the construction phase although it will be a small amount. This waste will be stored in skips to be removed and disposed of by the main contractor at a registered landfill site. The Environmental Control Officer (ECO) will oversee this operation as part of the implementation of the Environmental Management Programme.

2.5.4 ROADS AND ACCESS

The proposed site can be reached by travelling east on the R71 from Tzaneen Lifestyle Centre towards Tarentaalrand for 16.5 kilometres (km). Once at the Tarentaalrand 4-way stop, turn right (south) towards Nkowankowa and continue for 5.7 km towards the Letaba Estates main entrance gate on the lefthand side of the road. The farm is serviced by a series of surfaced and unsurfaced roads. No road upgrades are required for this proposed project.

3. POLICY AND LEGISLATIVE CONTEXT

3.1 RELEVANT ACTS

3.1.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA ACT, 1996 (ACT NO 108 OF 1996)

Section 24 of the Constitution of South Africa No. 108 of 1996 states *that "…everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that (c) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."* This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development. The proposed project will ensure of such rights.

3.1.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998) [NEMA]

The National Environmental Management Act (Act No. 107 of 1998) (NEMA) provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of the State, as well as to provide for matters connected there with.

Section 2 of NEMA establishes a set of principles that apply to the activities of all organs of state that may significantly affect the environment. These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;

- Waste must be avoided or minimised, reused or recycled;
- Negative impacts must be minimised; and
- Responsibility for the environmental health and safety consequences of a policy, project, product or service exists throughout its life cycle.

Section 28(1) states that: "*Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring*." If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution; and
- Remedying the effects of the pollution.

The proposed development includes activities that fall within the scheduled activities under the Environmental Impact Assessment (EIA) Regulations 2014 in Listing Notices 1, 2 and 3 and published in Government Notices No. R. 327, 325 and 324.

Applicable listed activities and their relevance in terms of the proposed development are outlined in **Table 5** below:

Table 5: Applicable listed activities under the EIA Regulations 2014

Government Notice Number and Date	Activity in terms of Government Notice	Project Relevance
GNR 327 of April 2017 **Listing Notice 1**	**<u>Activity 19</u>** The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse	Earthworks for dam construction will involve excavation in the excess of $10m^3$.

Government Notice Number and Date	Activity in terms of Government Notice	Project Relevance
GNR 325 of April 2017 **Listing Notice 2**	**Activity 15** The clearance of an area of 20 hectares or more of indigenous vegetation	The total footprint of the project will be approximately 51.08 hectares which will require clearance of indigenous vegetation (greater than 20 hectares).
GNR 325 of April 2017 **Listing Notice 2**	**Activity 16** The development of a dam where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the highwater mark of the dam covers an area of 10 hectares or more.	All dams will have a maximum wall with a heigh of more than 5 meters.
GNR 324 of April 2017 **Listing Notice 3**	**Activity 12** The clearance of an area of 300 square metres or more of indigenous vegetation. e) In Limpopo: ii. Within critically biodiversity areas identified in bioregional plans.	Dam Site No. 5 (included in both Alternatives) will be approximately 15 hectares in extent which will require clearance of indigenous vegetation (greater than 300 meters) and the site falls within a Critical Biodiversity Area (Ecological Support) according to the Limpopo C-Plan.
GNR 324 of April 2017 **Listing Notice 3**	**Activity 14** The development (i) of dams or weirs, where the dam or weir including infrastructure and water surface area exceeds 10	The construction of Dam No 5 (included in both Alternatives) will involve a footprint greater than 10m^2 and the site falls within a Critical Biodiversity

Government Notice Number and Date	Activity in terms of Government Notice	Project Relevance
	square metres; where such development occurs— (a) within a watercourse; e) In Limpopo: i. Outside urban areas: ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	(Ecological Support) Area according to the Limpopo C-Plan.

3.1.3 THE NATIONAL WATER ACT 1998 (ACT NO 36 OF 1998) [NWA]

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. Section 19 of the NWA, which states that an owner of land, a person in control of land or a person who occupies or uses the land which thereby causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring and must therefore comply with any prescribed waste standard or management practices.

The proposed project requires authorisation in terms of the National Water Act, 1998 (Act No. 36 of 1998) [NWA]. The project triggers the following activities in terms of Section 21 of the NWA:

- S21(b) Storing water;
- S21(c) Impeding or diverting the flow of water in a watercourse;
- S21(i) Altering the bed, banks, course or characteristics of a watercourse.

3.1.4 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004) [NEMBA]

The purpose of NEMBA is to provide for the management and conservation of South Africa's

biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.

The fauna and flora prevailing in the study area will be handled in terms of the NEMBA as amended, including all the pieces of legislation published in terms of this act.

3.1.5 THE NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT NO. 25 OF 1999) [NHRA]

The NHRA legislates the necessity for Heritage Impact Assessment (HIA) in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments (including roads) exceed 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the Provincial Heritage Resources Agency – Limpopo (LIHRA).

The HIA (see **Annexure F.4**) and EMPr (see **Annexure H**) outline the correct procedures to be followed should features, sites or artefacts of cultural significance that could be impacted on by the proposed development be identified during construction.

3.1.6 CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983 (ACT 43 OF 1983) (CARA)

The CARA aims to provide for the protection and control of utilisation of the country's agricultural resources in order to promote conservation of soils, water and natural vegetation as well as the combatting of weeds and invader plants. Sustainable utilisation is a key objective. CARA was therefore used for determining the agricultural significance, value and subsequently the adequate management of the proposed project area.

3.2 RELEVANT POLICIES AND GUIDELINES

3.2.1 DEPARTMENT OF ENVIRONMENTAL AFFAIRS INTEGRATED ENVIRONMENTAL MANAGEMENT GUIDELINES

Integrated Environmental Management (IEM) is a tool that encourages a holistic approach towards the decision-making process on projects that could potentially have environmental impacts. The tool informs all stakeholders about the range of tools available to align with the

principles of sustainable development. The philosophy emphasises the need to integrate the social, environmental and economic aspects of every development project in all stages. Integration of environmental considerations across the full life cycle of the activity, integration of knowledge across specialist disciplines, integration all relevant stakeholders and integration pf all tools necessary for the decision-making process throughout the fully cycle of an activity. That is implies consideration of environmental issues through the pre-feasibility, feasibility, planning and design, construction, operational and decommissioning phases.

3.2.2 MOPANI DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN 2022-2023 (IDP)

The aim of the Mopani District IDP is to provide a coherent plan for the improvement of quality of life in the Mopani District and to also reflect on issues of national and provincial importance. The aim of the IDP is further to be in alignment with national and provincial priorities, policies and strategies (national and provincial importance).

The IDP is approved by Council and has legal status. The Mopani District Municipality has embarked upon a revolutionary process of integrating the IDP's, budget and Performance Management Systems of municipalities within the Mopani District-wide territorial space. The IDP support the transition to environmental sustainability. Performance Management System of MDM is integrated with the IDP and SDBIP. It is an enabler for MDM to Report, Monitor and Review the implementation of IDP for better accountability and benchmarking amongst its municipalities. Decisions with regard to planning and development should be aligned with development policies within the municipality. The policies should guide developers to appropriate locations including the nature of the proposed development. In the Mopani District, farming is the second largest employer with 25.9% of the employed people. The proposed development therefore aligns with the District Municipality IDP.

3.2.3 GREATER TZANEEN LOCAL MUNICIPALITY INTEGRATED DEVELOPMENT PLAN (IDP) 2022-2023

The Greater Tzaneen Local Municipality Integrated Development Plan (IDP) promotes amongst others social and economic development, provides and maintains affordable quality and sustainable services, ensures efficient and effective utilization of all available resources, promotes safe healthy communities & environmental sustainability. The next level of spatial planning in terms of Section 26 of the Municipal Systems Act, and aligned with the IDP, is the Municipal Spatial Development Framework (MSDF). Policies should reflect development

priorities and are updated in five-year cycles. Decisions with regard to planning and development should be aligned with development policies within the municipality. The policies should guide developers to appropriate locations including the nature of the proposed development.

3.2.4 NATIONAL DEVELOPMENT PLAN – 2030 (NDP)

The executive summary of the National Development Plan (NDP) begins with the following paragraph.

"The National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society".

One of the objectives of the objectives of the NDP is to ensure a faster and more inclusive economic growth and to implement this objective would require the Increasing exports, focusing on those areas where South Africa already has endowments and comparative advantage, agriculture and agro-processing. The proposed project will create more jobs based on the growth in productivity of the farm. It is therefore important that agriculture businesses have access to sufficient storage capacity for water to be used in the dry months. The proposed project can be seen as an investment in new agricultural technologies and an adaptation strategy that ultimately protect rural livelihoods through the expansion of commercial agriculture.

The proposed development will contribute, at a local level, to the achievement of goals or objectives described with regards to agriculture in the NDP.

3.2.5 LIMPOPO PROVINCE BIODIVERSITY CONSERVATION PLAN (C-PLAN)

The Bioregional Plan is a spatial plan that shows terrestrial and aquatic features that are critical for conserving biodiversity and maintaining ecosystem functioning. These areas are referred to as Critical Biodiversity Areas (CBA's) and Ecological Support Areas (ESA's) in addition, the Bioregional Plan outlines measures for the effective management of biodiversity.

According to the Limpopo Biodiversity Conservation Plan, Dam Site No. 5 is located inside an Ecological Support Area 2 (Refer to **Figure 12**). As such, the management recommendations of the Limpopo Biodiversity Conservation Plan are relevant in the planning of the proposed development.

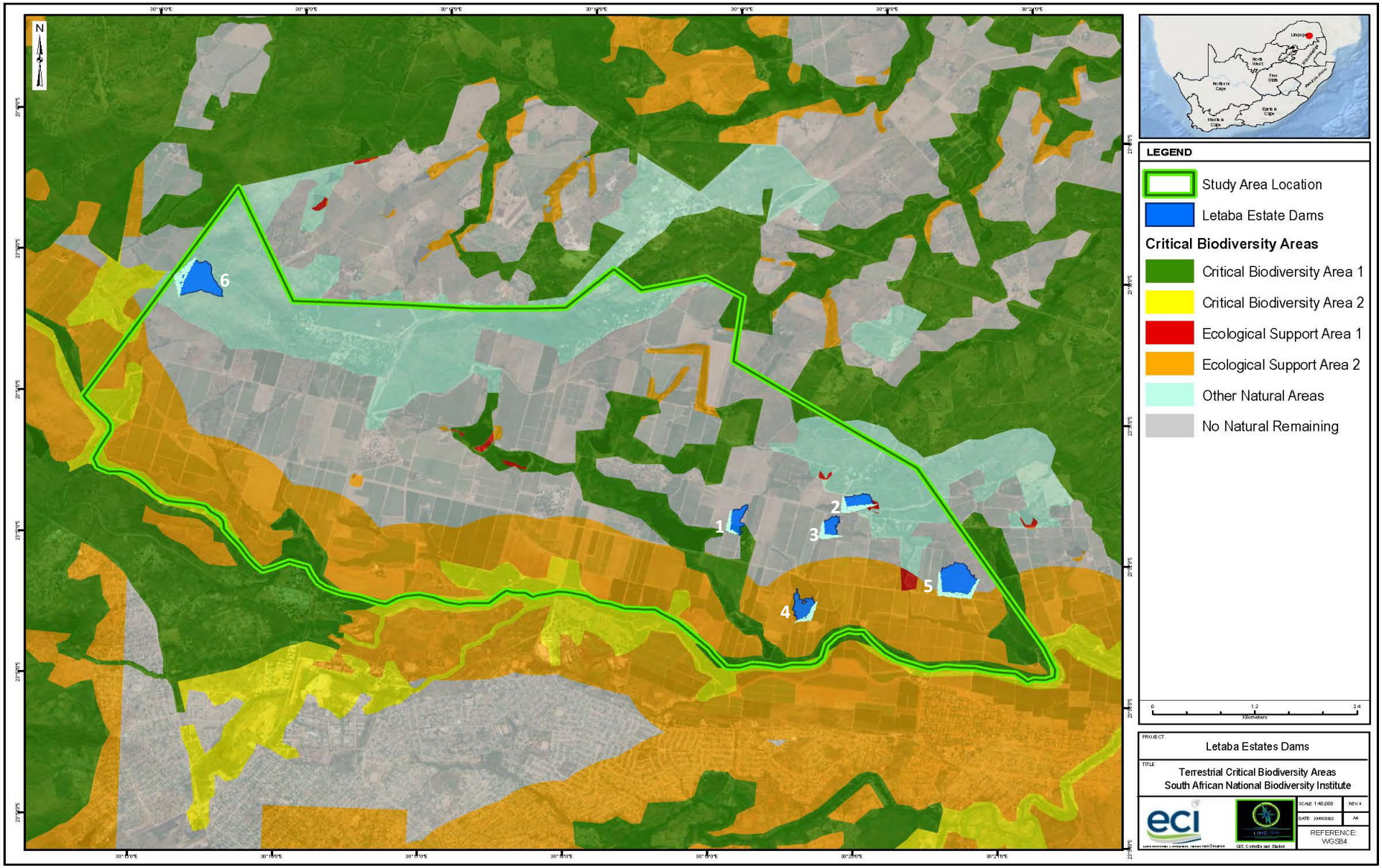

Figure 12: Map showing the CBAs in the Letaba Estates Area

4. NEED AND DESIRABILITY

As stated in the DEA Need and Desirability guideline (GNR 891 of 2014), it is essential that growth in the economy addresses national policies and strategies. The implementation of these policies (social and economic) needs to take into consideration concerns such as climate change, food security and the status of ecosystem services. To achieve a better quality of life for all, society needs to improve the efficiency and responsibility with which resources are used.

As stated in the IDP, based on the review of the national, provincial and local policies and strategies, the Greater Tzaneen should focus on working towards the municipality vision by creating an enabling environment to attract new businesses and investment, which will ultimately result in job creation and economic growth, with agriculture being one of the key sectors of focus. This is mainly because agriculture is the largest driver of economic driver in the municipality such that the manufacturing sector in the Greater Tzaneen is also dependent on the agriculture sector, as agro-processing is one of the main manufacturing subsectors.

With the impacts of climate change affecting seasonal rainfall globally, it is imperative for farms to ensure adequate water supply for irrigation of crops. Farm dams therefore play a critical role in agriculture worldwide. They provide secure annual water supply for consumptive purposes including irrigation and domestic purposes. They are important because they improve the viability and productivity of agricultural activities in a local region. Ensuring that local farmers are productive is important for the province and its economy. In addition, the availability of dams provide habitat for a wide variety of native wildlife.

The proposed activity was considered under the following two strategic goals:

4.1 PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

South Africa has a market-oriented agricultural economy that is highly diversified and includes the production of citrus. Value-added activities in the sector include processing and preserving of fruit among others.

The proposed development is promoting an already existing market of citrus fruit export and will ensure that there will be enough water for irrigation during the dry season and when natural

disasters (such as drought) strike. The establishment of the proposed six dams therefore supports growth in the agriculture industry.

4.2 SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES

This goal aims to improve the efficiency and responsibility with which resources are used. Thus, while there is a need for economic and social development, all of the impacts have to be taken into consideration in order to ensure long-term sustainable development.

Better management of water resources, by dam construction, is crucial for agriculture due to climate change and water scarcity. With the growing demand for fresh water in the agriculture sector, the movement of the large dam's construction started, and global river systems have been increasingly altered by dams for water and energy needs. To ensure sustainability, the proposed dams are designed in a way that no direct abstraction from the natural river systems will take place. Water will be stored from the already existing irrigation canal and only the maximum allocated water capacity will be stored.

The dams will form part of the existing irrigation network, fed by the Letaba North irrigation canal, with its source being the Letaba River located directly south of the relevant properties. The irrigation canal is managed by the Letaba Water User Association (LWUA) and is utilised for irrigation of a variety fresh fruit along the banks of the Letaba River throughout the area. The proposed dams will receive water from the irrigation canal through controlled releases, as well as a small amount of surface runoff water during the wet season.

During dry periods, the LWUA imposes water restrictions in terms of the allocated amount of water that can be abstracted from the Letaba North Canal. Presently, the Applicant is storing a low percentage of their water allocation and the construction of the six dams will help in storing and utilising the full volume of water allocated to them to enable irrigation of the orchards during the dry season.

The proposed activity will therefore be constructed on sustainable principles and also promote sustainability. A number of mitigation measures will be implemented during the construction as well as the operational phases to ensure that the impact on the environment is as low as possible.

5. PUBLIC PARTICIPATION

Public consultation is a legal requirement throughout the S&EIR process. All documents must be made available for public review and comment by the proponent, these include the Scoping Report and Terms of Reference for the EIA, the draft and final EIA reports and the decision of the Competent Authority.

The method of public consultation to be used depends largely on the location of the development and the preferred language and level of literacy of those being impacted on by the project. Required means of public consultation include:

- Site notice(s);
- Newspaper advertisements;
- Letters of notification and information to affected landowner(s), stakeholders and registered I&APs;
- Stakeholder meetings; and
- Authority and Stakeholder engagement

Refer to **Annexure E** for proof of the public participation process to date.

5.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

The proposed activity was advertised in the **Letaba Herald** on **Friday**, **1 July 2022**. The advertisement provided an overview of the details of the proposed development and provided I&APs with the information on how and where to register their interest or provide comment. In addition to the newspaper advert the following actions were undertaken:

- A site notices were placed at a visible location; and
- Notification letters were sent to Adjacent Landowners, State Department and Parastatals.

The Draft Scoping Report was advertised for a 30-day commenting period **(from Friday, 1 July 2022 to Monday, 1 August 2022).** Notifications were sent out to all Registered I&AP's, relevant State Departments, Parastatals and NGO's. A section 38 Application was also lodged on the SHARIS portal.

Proof of the above notifications as well as correspondence and comments received to date can be found in **Annexure E** of this Draft EIR.

5.2 SCOPING PHASE

All comments received during the draft and final scoping phases have been captured and addressed in the Comments and Responses Report (CRR). Refer to **Annexure E.6**

5.3 ENVIRONMENTAL IMPACT REPORTING PHASE

The Draft EIR is now available to registered Interested and Affected Parties (I&AP's) and State Departments for review and comment for a period of 30 calendar days (**from Monday, 9 January 2023 to Wednesday, 8 February 2023)**. All comments received on the Draft EIR will be incorporated and addressed in the Final EIR which will be submitted to the LEDET for review and decision-making.

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

6.1 BIOPHYSICAL ENVIRONMENT

The appointed Ecologist, Wetland Specialist, Heritage Practitioner and EAP each conducted a site visit and the findings are outlined below refer to **Annexure F** for all the specialist reports.

6.1.1 CURRENT LAND USE

The study area consists mostly of cultivated land in the form of irrigated citrus orchards. Bushveld vegetation occurs along the sides and foot slopes of the elevated areas in the north of the study area. The non-perennial tributaries are dominated by moderate to dense riparian vegetation.

6.1.2 CLIMATE

The area is influenced by the local steppe climate. There is little rainfall throughout the year. The Mean Annual Precipitation is 881 mm, and Mean Annual Temperature is 19.7 °C (**Figure 13**).

According to Köppen -Geiger system (Kottek et al. 2006), the study site falls within the CWa climatic region.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	26	25.1	24.2	21.6	19.4	16.9	16.8	18.5	21	22.6	24.2	25.7
Min. Temperature (°C)	20.4	19.9	19.1	15.9	12.3	9.3	9.4	11.1	14.1	16.3	18.4	19.9
Max. Temperature (°C)	31.6	30.3	29.3	27.4	26.5	24.5	24.3	26	28	29	30.1	31.5
Avg. Temperature (°F)	78.8	77.2	75.6	70.9	66.9	62.4	62.2	65.3	69.8	72.7	75.6	78.3
Min. Temperature (°F)	68.7	67.8	66.4	60.6	54.1	48.7	48.9	52.0	57.4	61.3	65.1	67.8
Max. Temperature (°F)	88.9	86.5	84.7	81.3	79.7	76.1	75.7	78.8	82.4	84.2	86.2	88.7
Precipitation / Rainfall (mm)	126	140	81	27	17	4	8	6	21	38	79	53

Figure 13: Climatic diagram representative of the region (Mucina and Rutherford, 2006).

6.1.3 VEGETATION

The dominant vegetation type found on the study site is Granite Lowveld, where the proposed five dams will be located, and the sixth dam falls within Tzaneen Sour Bushveld which is a Vulnerable Ecosystem (**Figure 14**).

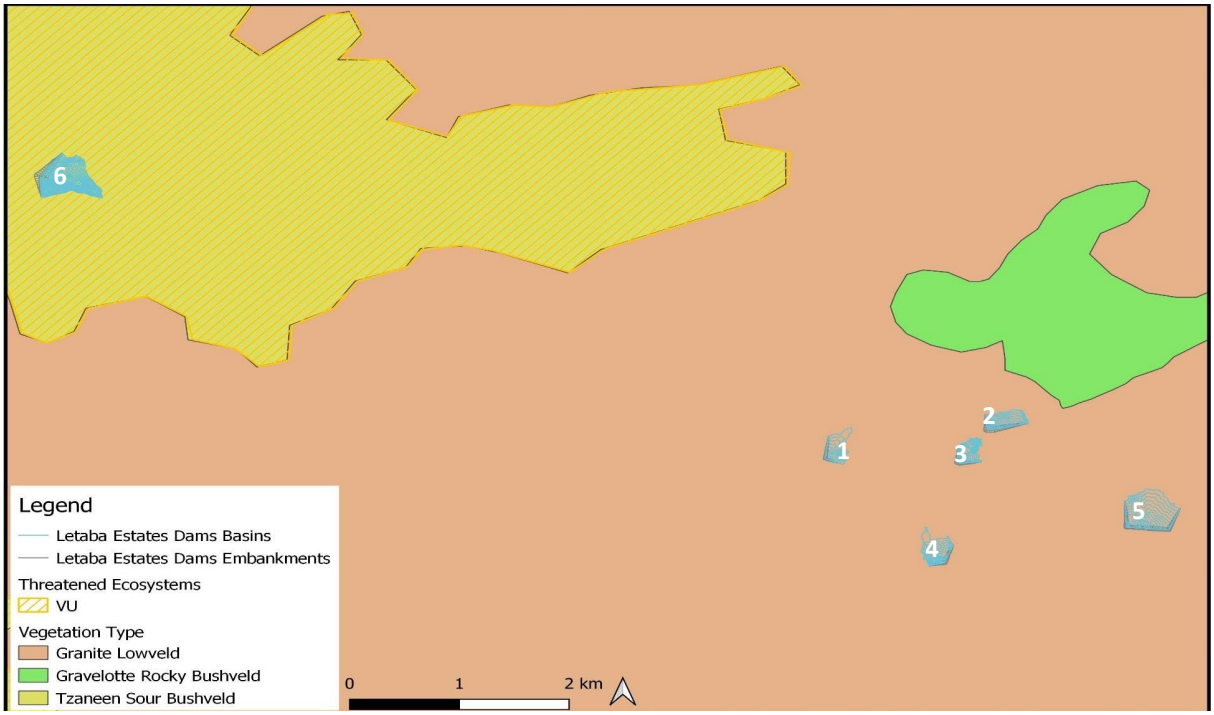

Figure 14: Threatened Ecosystems map around the proposed development area.

The geographic region of the proposed development falls on the Savanna Biome. The Savanna Biome is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the lowveld and Kalahari region of South Africa and is also the dominant vegetation in Botswana, Namibia and Zimbabwe. It is characterized by a grassy ground layer and a distinct upper layer of woody plants. Where this upper layer is near the ground the vegetation may be referred to as Shrubveld, where it is dense as Woodland, and the intermediate stages are locally known as Bushveld.

The environmental factors delimiting the biome are complex altitude ranges from sea level to 2 000 m. Rainfall varies from 235 to 1 000 mm per year. Frost may occur from 0 to 120 days per year and almost every major geological and soil type occurs within the biome. A major factor delimiting the biome is the lack of sufficient rainfall which prevents the upper layer from dominating, coupled with fires and grazing, which keep the grass layer dominant. Summer rainfall is essential for the grass dominance, which, with its fine material, fuels near-annual fires. In fact, almost all species are adapted to survive fires, usually with less than 10% of

plants, both in the grass and tree layer, killed by fire. Even with severe burning, most species can resprout from the stem bases.

The grass layer is dominated by C 4-type grasses, which are at an advantage where the growing season is hot, but where rainfall has a stronger winter component, C 3-type grasses dominate. The shrub-tree layer may vary from 1 to 20 m in height, but in Bushveld typically varies from 3 to 7 m. The shrub-tree element may come to dominate the vegetation in areas which are being overgrazed (Low & Rebelo, 1996). The vegetation types found within the study site are Granite Lowveld and Tzaneen Sour Bushveld (**Figure 15**), and they are described below.

Granite Lowveld

This vegetation type is found in Limpopo and Mpumalanga Provinces, Swaziland and marginally also KwaZulu-Natal as shown in **Figure 15** below. A north-south belt on the plains east of the escarpment from Thohoyandou in the north, interrupted in the Bolobedu area, continued in the Bitavi area, with an eastward extension on the plains around the Murchison Range and southwards to Abel Erasmus Pass, Mica and Hoedspruit areas to the area east of Bushbuckridge (Mucina & Rutherford 2006).

Tzaneen Sour Bushveld

This vegetation unit is found in Limpopo Province: A band extending along the footslopes and hills of the northeastern escarpment, from the Soutpansberg Mountains in the north via Tzaneen and narrowing to the Abel Erasmus Pass area in the south. Altitude 600–1 000 m and higher in places (Mucina & Rutherford 2006).

Alien and Invasive flora species

Invasive alien species are establishing and expanding in growing number world, and in many parts of the invasions are often followed by major negative effects on ecosystems, the environment, and human health. Alien and invasive species were encountered on site, the species is listed and **Table 6** below gives a detailed description of the species.

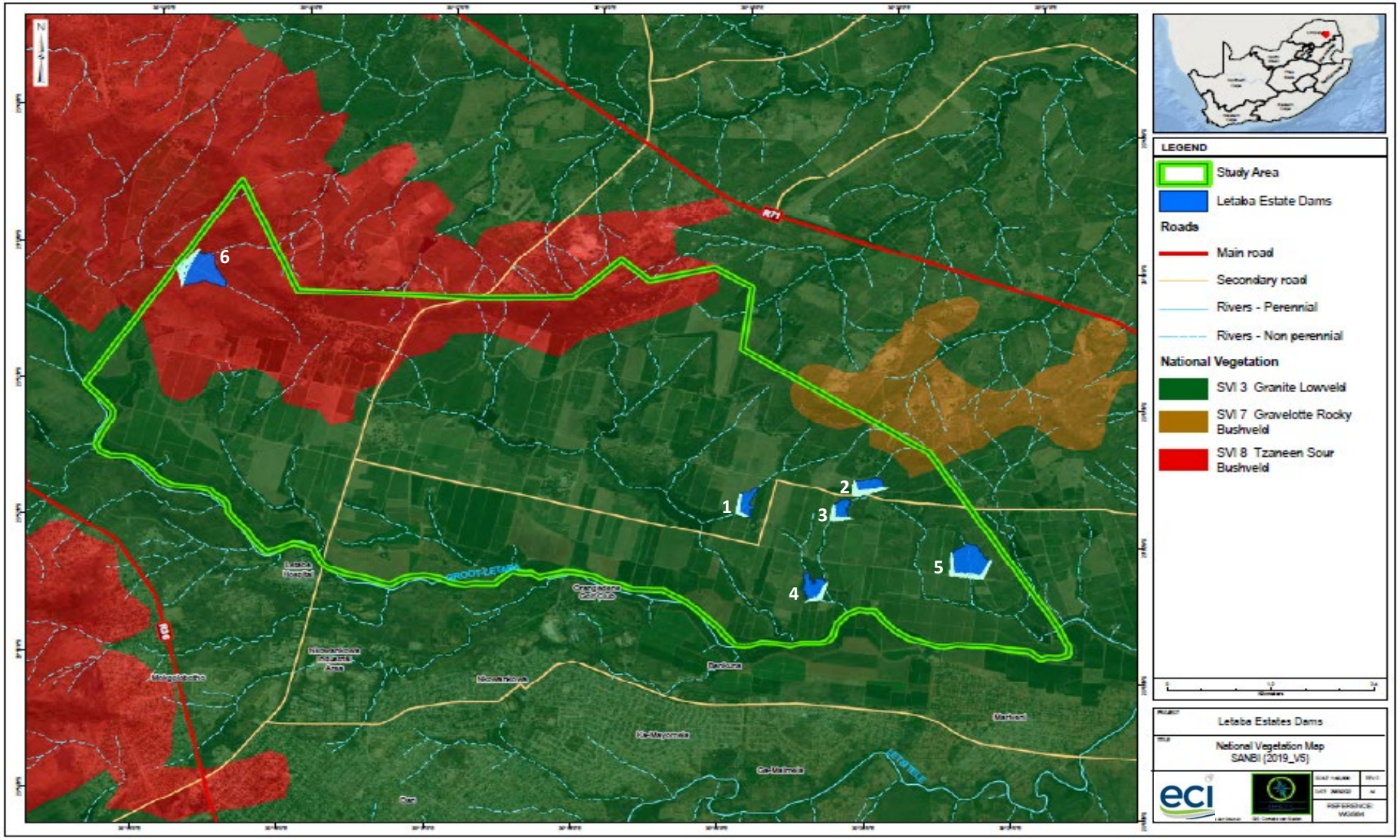

Figure 15: The National Vegetation Map as it relates to the study site

Table 6: Vegetation species recorded during the field survey

Indigenous species			Non-indigenous species		
Scientific name	**Common name**	**Threat category**	**Scientific name**	**Common name**	Invasive Category
Senegalia nigrescens	Knob Thorn	LC	*Lantana camara*	Lantana	Declared Category 1b
Colophospermum mopane	Mopane Tree	LC	*Melia azedarach*	Syringa	Declared Category 1b
Ehretia rigida	Puzzle Bush	LC	*Ricinus communis*	castor oil plant	Declared Category 2
Senna petersiana	Monkey Pod	LC			
Grewia flava	Velvet Raisin	LC			
Urochloa mosambicensis	Bushveld Signal Grass	LC			
Panicum schinzii	Sweet Grass	LC			
Aristida congesta subsp. Congesta	Tassel Three-awn	LC			
Digitaria eriantha	Common finger grass	LC			
Eragrostis curvula	Weeping lovegrass	LC			
Hyparrhenia hirta	Common Thatching Grass	LC			
Lippia javanica	Lemon bush	LC			
Typha capensis	Bulrush	LC			

6.1.4 RESULTS OF THE ECOLOGICAL ASSESSMENT

The area is comprised of two vegetation types on a local scale, i.e., transformed agricultural and a homogenous unit of vegetation. The majority of the study area has undergone vegetation transformation as a result of current agricultural activities. The bushveld has been modified through cultivation of citrus fruits and only a small, disconnected fragments of natural vegetation remain. Apart from Hippo's observed in other existing dams on the property, no sensitive faunal species were observed during the survey. All of the recorded species are of low sensitivity as they are mostly widespread species. There are no objections from an ecological perspective for the construction of in-stream dams to continue.

The DFFE screening tool was consulted for the proposed area of the vegetation clearance for construction of in-stream dams. The DFFE screening tool outputs highlighted the site as having Medium plant sensitivity, High animal sensitivity and Very High terrestrial biodiversity sensitivity. However, on site assessment revealed that the High animal and Medium sensitivity were not accurate due to the dominance of transformed land for citrus farming. The on-site assessment revealed that the site is of **LOW** sensitivity for both themes.

Refer to **Annexure F.2** for the complete Biodiversity Impact Report by Mora Ecological Services.

6.1.5 HYDROLOGY

The proposed dam sites are located on non-perennial tributaries of the Great Letaba River within quaternary catchment B81C, which forms part of the Olifants Water Management Area.

There are more than 20 major dams located in the Letaba Catchment (WRC, 2001). The Letaba River is the tributary of the Olifants River just upstream of the Mozambican border. The Molototsi River and Klein Letaba are the major tributaries contributing to the Letaba River. The macro-channel of the river may be described as bedrock-bounded (Van Niekerk et al., 1995; cited by Heritage et al., 2001). The channel is further characterised by steep bedrock including cascading boulder rapids with sporadic waterfalls (WRC, 2001). Further downstream in sections with gentler gradients, cobble riffles occur before changing to an alluvial channel type as it approaches the KNP (WRC, 2001). Deep pools may be found all along the Letaba River. There are several different morphological units due to varying sediment distribution along the Letaba River (Heritage et al., 2001). The hydrology of the system is dominated by low flows.

Throughout the Letaba Catchment, land use is dominated by commercial agriculture, afforestation, densely populated rural communities with informal, rain-fed agriculture, and protected areas in the eastern section of the catchment (Pollard & Du Toit, 2011a). The Letaba Catchment is home to intense, commercial agricultural activities where citrus, tropical fruits and vegetables are the most commonly farmed produce (Pollard & Du Toit, 2011a). Since the headwaters in the western section of the catchment are under commercial forestry, water resources are already under stress due to the additional demand of water supply for irrigators downstream. The upper reaches of the catchment are generally regarded as being in good condition, but it deteriorates further downstream due to natural salinization and nutrient enrichment by anthropogenic influences (Pollard & Du Toit, 2011a). The water supply schemes in the catchment currently consists of numerous small to major dams for storage, bulk water pipelines and extensive canal networks (Pollard & Du Toit, 2011a). More than a decade ago, Vlok and Engelbrecht (2000) noted that the Tzaneen Dam allocated 103.9 million m^3/a to irrigators, 8.4 million m3/a to households and industry, and 14.7 million m^3/a to environmental flows.

The water that was allocated exceeded available supply because Tzaneen Dam could only yield 98 million m^3/a (Vlok & Engelbrecht, 2000). Situations such as these highlight the magnitude of poor water management strategies in a stressed catchment such as Letaba. This will be remedied by the Raising of the Tzaneen Dam Wall project which is currently underway.

6.1.6 NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS (NFEPA)

National Freshwater Ecosystem Priority Areas (NFEPA) were identified for South Africa in 2011 through a collaborative project by several governmental departments, parastatals as well as none profit organisations. Freshwater Priority Areas (FEPAs) were identified using systematic conservation planning. FEPAs are areas which should remain in a natural or near-natural state to support the water resource protection goals of the National Water Act (Act 36 of 1998) (Nel et al. 2011).

Based on current outputs of the NFEPA project, it can be determined that Letaba catchment area is associated with a FEPA-designated catchment (corresponding with Quaternary Catchment) while also being marginally associated with an upstream management area (corresponding with Quaternary Catchment B81B). None of the proposed six dam sites fall directly within a NFEPA wetland. Refer to **Figure 16**.

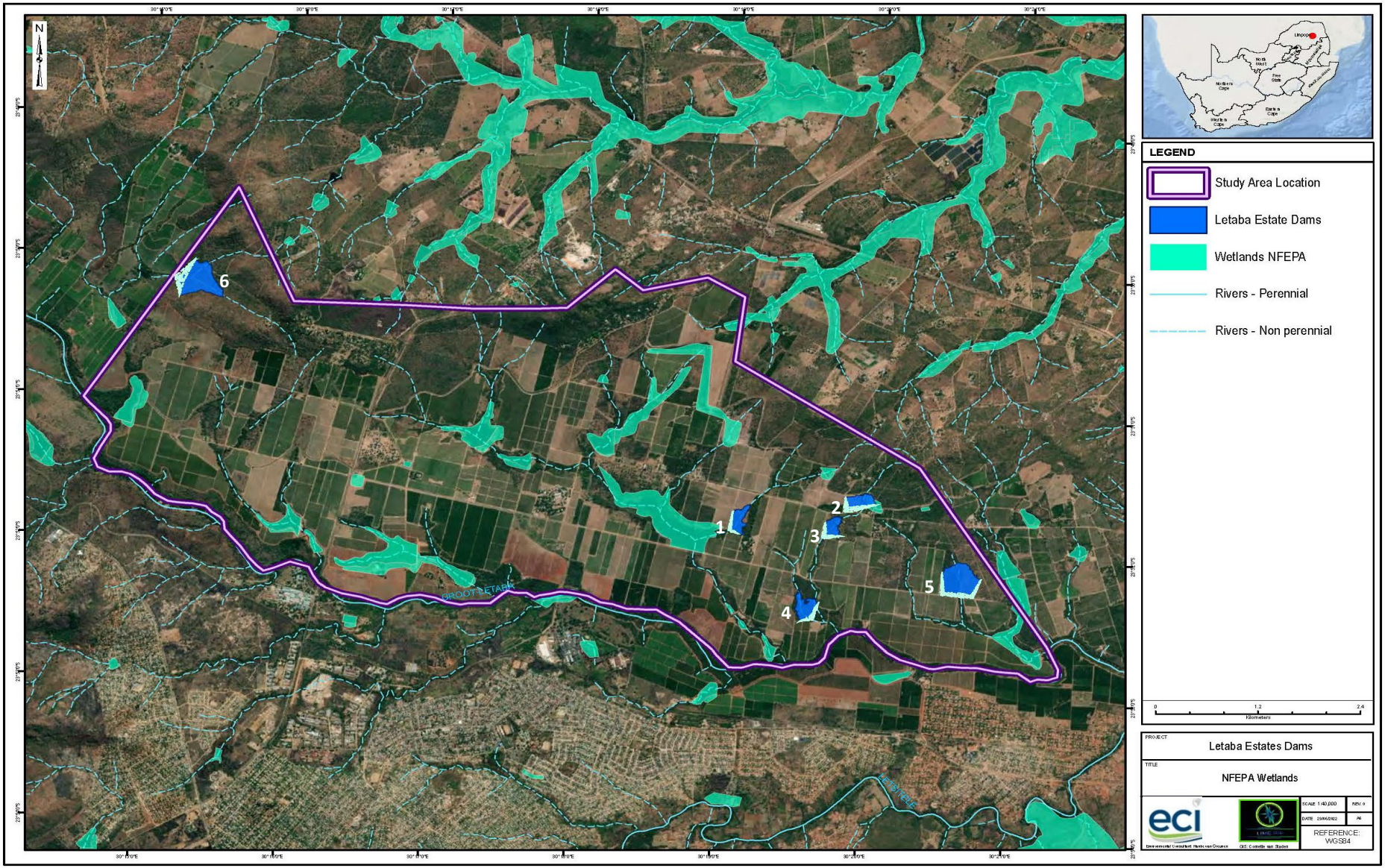

Figure 16: The NFEPA data layer

6.1.7 PHYSICAL WATER QUALITY

Aquatic communities are influenced by numerous natural and human-induced factors, including physical, chemical, and biological factors. The assessment of water quality variables in conjunction with assessment of biological assemblages is therefore important for the interpretation of results obtained during biological investigations. Water samples at some of the exiting river crossings were collected and tested. Refer to **Figure 17** for locations of the water sampling sites. The results are outlined under the subsequent headings.

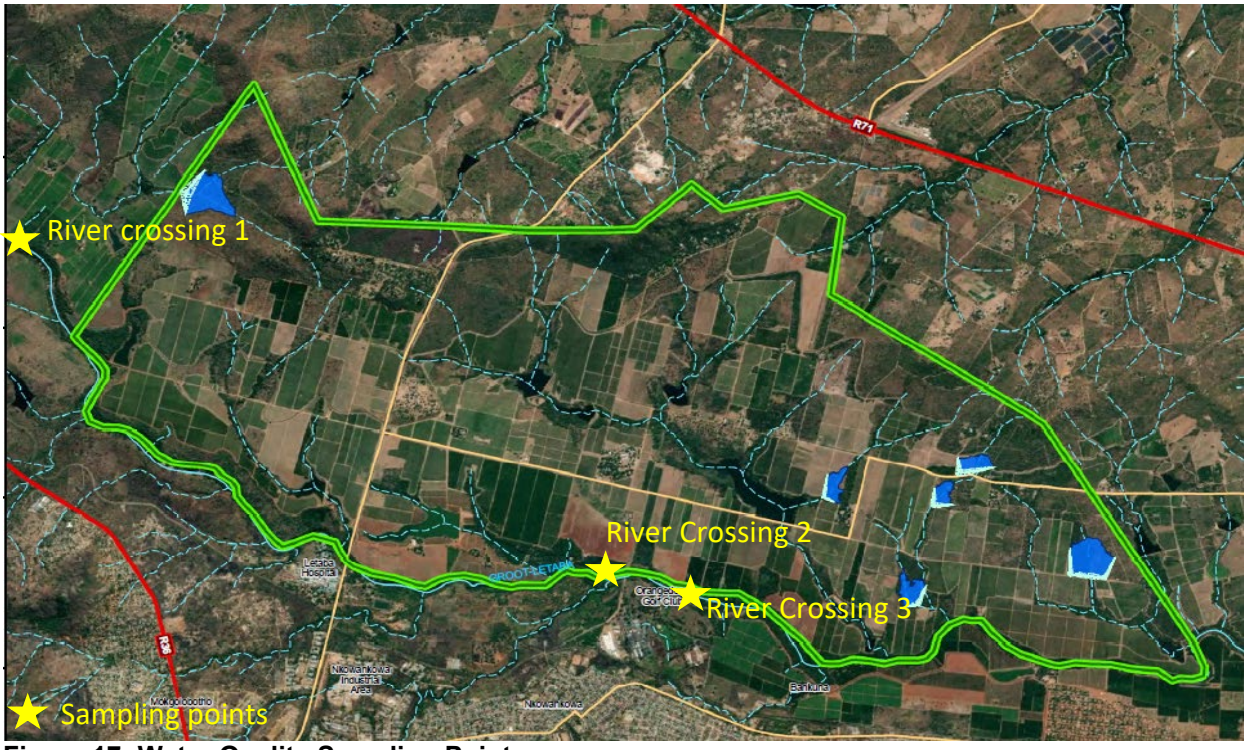

Figure 17: Water Quality Sampling Points

pH

The pH of natural waters is determined by both geological and atmospheric influences, as well as by biological activities. Most fresh waters are usually relatively well buffered and more or less neutral, with a pH range of 6.0 to 8.0, and most are slightly alkaline due to the presence of bicarbonates of the alkali and alkaline earth metals (DWAF, 1996).

The pH target for freshwater aquatic fauna is presented as ranging between 6.5 and 9.0, as most species will tolerate and reproduce successfully within this range (Alabaster and Lloyd, 1982). During the October 2022 survey, pH values were neutral to alkaline and ranged from 7.21 (River crossing 3) to 7.89 (River Crossing 2) (**Table 7**). A pH value of > 9.0 usually

indicates eutrophic conditions (nutrient enrichment) (Davies and Day, 1998). The nutrient loads that cause eutrophication are a consequence of human activities and may come from runoff from farms, industrial, urban, and animal waste.

Dissolved Oxygen

The maintenance of adequate dissolved oxygen (DO) is critical for the functioning of aquatic ecosystems since it is required for the respiration of all aerobic organisms (DWAF, 1996). Therefore, DO concentration provides a useful measure of the health of an ecosystem (DWAF, 1996). The median guideline for DO for the protection of aquatic biota is > 5 mg/ℓ (Kempster et al., 1980).

During the October 2022 survey, DO concentrations were adequate ranging from 6.2 mg/ℓ to 6.92 (**Table 7**).

Conductivity

An increase or decrease in conductivity in a body of water can indicate pollution. Agricultural runoff or a sewage leak will increase conductivity due to the additional chloride, phosphate and nitrate ions. An oil spill or addition of other organic compounds would decrease conductivity as these elements do not break down into ions. In both cases, the additional dissolved solids will have a negative impact on water quality. The highest electrical conductivity was recorded at River crossing 2 (28. mS/m), followed by River crossing 2 at 19 mS/m.

Table 7: Provides the in-situ water quality data obtained at existing river crossings at each site assessed during the October 2022

Site Name	Survey	Time	pH	EC (mS/m)	Dissolved Oxygen		Temp (°C)
Limit			**6.5 – 8.4**	**≤40**	**80 – 120**	**≥6.0**	
River Crossing 1	October 2022	15:49	7.52	16.0	65	6.2	18.2
River Crossing 2	October 2022	16:50	7.89	28	70	6.5	17.5
River Crossing 3	October 2022	13:00	7.21	19	76	69	22.2

6.1.8 AQUATIC MACROINVERTEBRATE HABITAT

The IHAS (McMillan, 1998) provides a quantitative and comparable description of habitat availability for the aquatic invertebrates sampled. The IHAS was developed to assist with the interpretation of SASS5 scores, particularly in respect of variability in the number and quality of biotopes available for sampling. The goal of IHAS is to adequately reflect the quantity, quality, and diversity of biotopes available for colonisation by invertebrates.

Poor IHAS scores were recorded at all biomonitoring sites. River Crossing 2 recorded the lowest IHAS score (56%), followed by River crossing 1 (67%). The highest IHAS score was recorded at River crossing 3 (79%). Low diversity of habitats within the study area is attributed to the nature of the associated watercourses and sites assessed (being not easily accessible for livestock and people as well as the underlying geology which has resulted in a notable lack of stones habitat. Further, all sites assessed had relatively small, low-gradient catchments and thus a low accumulation of flow, resulting is slow-flowing hydraulic habitat.

Table 8: Shows the percentage of habitat sampled at existing river crossings at each site assessed during the October 2022

TAXON	River Crossing 1	River Crossing 2	River Crossing 3
Stones in current (Max 20%)	10	8	18
Vegetation (Max 15%)	12	10	14
Other habitat /general (Max 20%)	15	17	16
TOTAL % SAMPLING HABITAT (A)	37	35	49
Physical (Max 45%) (B)	30	21	31
TOTAL IHAS SCORE (A+B)	67	56	79

Macroinvertebrates results

Macroinvertebrates constitute one of the taxonomic groups of which the distribution is considered to reflect the chemical quality of surface waters and, consequently, the aquatic ecosystem health. The monitoring of benthic macroinvertebrates species forms an integral part in the monitoring of the health of a system, because they are relatively sedentary and enable the detection of localised disturbances.

A total of 14 aquatic macroinvertebrate families were collected during October 2022 biomonitoring assessment, River crossing 1 achieved the highest score (90) and the lowest at

River crossing 3 (80), while ASPT (Average Score Per Taxon) values ranged from 5.7 River crossing 3, to 6.83 at River crossing 2.

Refer to **Annexure F.3** for the complete Aquatic Impact Report by Mora Ecological Services.

6.2 SOCIO-ECONOMIC ENVIRONMENT

The proposed project is located within Ward 17 of the Greater Tzaneen Local Municipality. Ward 17 has a total population of 12 655 people of which die medial age is 24. Languages spoken in Ward 17 is Xitsonga at 48%, Sepedi at 35% and Sesotho at 11%. Ward 17 has a total of 3 749 households where 52% of homes is recorded as fully owned and paid off. Of all the households within the ward, 44,9% is recorded as households with women as their head. The average annual income is recorded at R14 600 with an employment rate of 38.1%. The unemployment rate for the ward is at 19%. Only 33.9% of the people in the ward is recorded to have completed matric and 61.9% is recorded to have completed Grade 9 or higher.

6.2.1 POPULATION

According to Statistics SA the Greater Tzaneen Municipality has a population size of 390 095, which is the largest municipality in terms of population contribution (36%) in the Mopani District. The project is located in Ward 17 of the Municipality and the current population figure for the ward is 12 655. Of the population from Ward 17, 99% of the population are black African, with whites second at 1% as per Census 2011 results. Most of the people speak Xitsonga as a first language at 46,0%, followed by Sepedi at 40,7%. Other official languages make up 6%.

6.2.2 SURROUNDING LAND USES

The proposed six dams project falls within the Greater Tzaneen Local Municipality Ward 17. The majority of the land uses surrounding the application properties are residential and agricultural. Residential use to the south of the application properties includes the Nkowankowa, Mariveni, Ka-Mayomela and Ga-Maimela and Letaba Hospital is found on the south western side of the application site.

6.2.3 GOVERNMENT

The proposed project falls within the Greater Tzaneen Local Municipality of Mopani District, Limpopo Province. The Greater Tzaneen Municipality comprises an area of 2 903.3 km², and approximately 416 146 residents.

6.2.4 HERITAGE

Refer to **Annexure F.4** for the Heritage Impact Assessment Report by Shasa Heritage Consultants. A brief summary follows:

A pedestrian survey of the area was undertaken by Mr FE Roodt on 4 December 2022 during the morning and afternoon, during which standard methods of observation were applied. Special attention was given to any areas displaying soil and or vegetative changes. As most archaeological material occurs in single or multiple stratified layers beneath the soil surface, special attention was given to disturbances, both man-made such as roads and clearings, as well as those made by natural agents such as burrowing animals and erosion.

The findings of the Heritage Impacts Assessment are that no heritage resources or graves were recorded on site. The report further identified that the area lies within the grey zone on SAHRIS map and thus no PIA is required. Palaeontological remains cannot be found in granite due to rock formation processes. It was recommended by the heritage specialist that a Palaeontological Impact Assessment will not be required.

6.2.5 VISUAL

The adulating topography of the area as well as the dense vegetation growth in the area results in a high Visual Absorption Capacity (VAC) which implies that changes to the existing landscape character will be concealed from potential visual receptors such as neighbouring landowners.

A ridgeline directly north of the property implies that none of the proposed dams or dam walls will be visible to visual receptors located to the north. The dam walls may be visible to visual receptors in the east west and south however due to the sheer size of the Letaba Estates (over 3500 hectares) and the great viewing distance of these visual receptors the visual impact is considered to be **LOW**. Refer to **Figure 18** for the Viewshed Analyses.

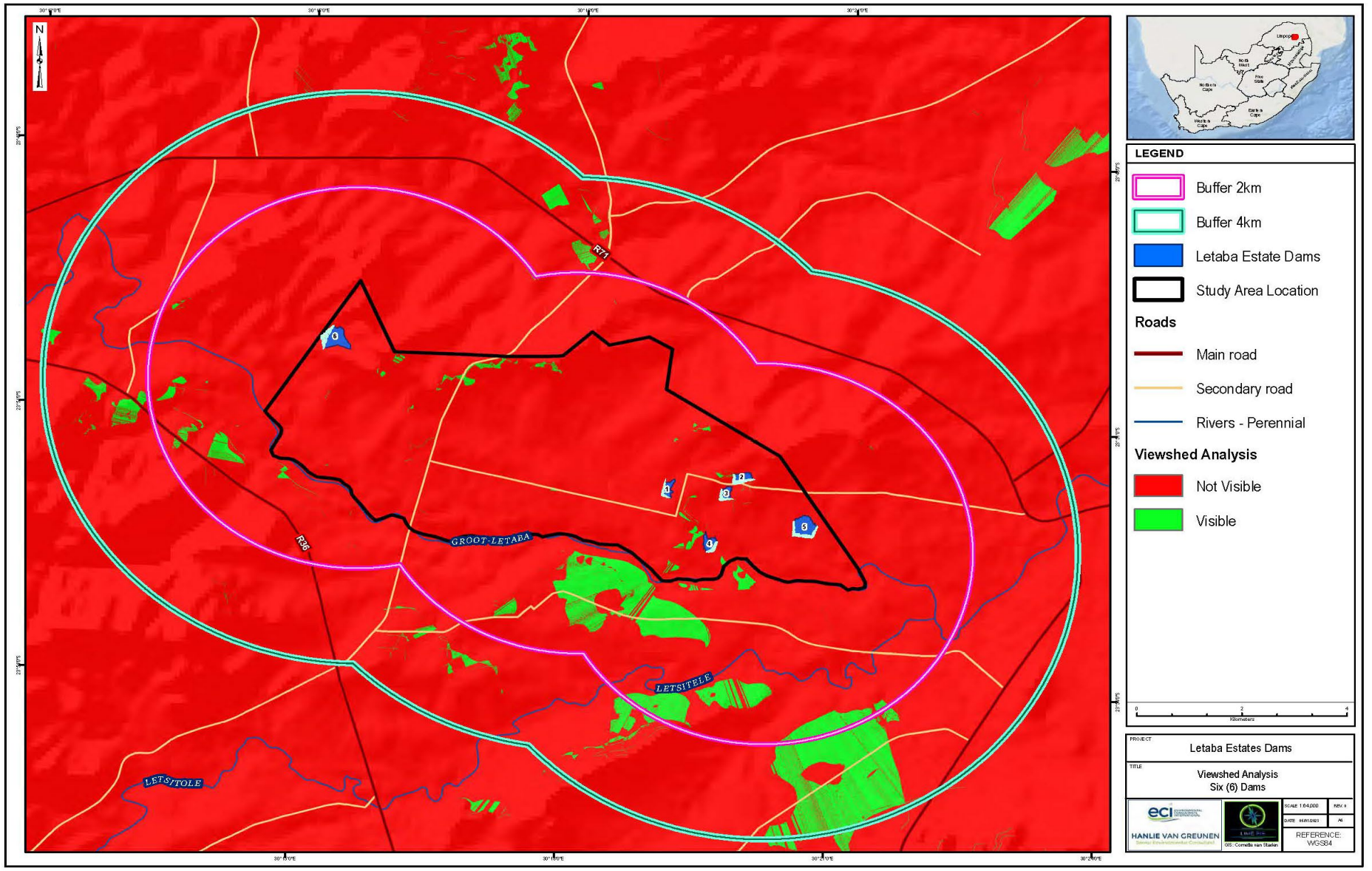

Figure 18: Viewshed Analysis

7. IDENTIFIED IMPACTS

7.1 POTENTIAL ENVIRONMENTAL ISSUES AND IMPACTS

The environmental issues and resulting impacts that have been identified for all phases of the project are provided below. The identification of these impacts resulted the recommendation of specialist assessments. These identified impacts were identified during the scoping phase and will now be assessed further as part of the EIA phase (**Section 9**). Appropriate mitigation measures will be recommended in order to reduce the significance of these potential impacts.

7.1.1 BIOPHYSICAL IMPACTS

- Potential impacts on soil and ground and surface water quality that may occur as a result of the spillage of hydrocarbons, and hazardous chemicals (during construction and operation);
- Potential impacts on soil and ground and surface water quality that may occur as a result of the generation of waste (during construction);
- Increased soil erosion as a result of vegetation clearance and increased stormwater runoff from hard surfaces (during construction and operation);
- Potential impacts on vegetation and loss of habitat (during construction);
- Potential impacts on the availability of surface water generated by run-off (during operation).

7.1.2 SOCIO-ECONOMIC IMPACTS

- Impacts on ambient air quality dust and noise generation (during construction);
- Change in the visual character of the area (during construction and operation);
- Potential impacts on existing cultural and heritage resources (during construction);
- Potential impacts on traffic (during construction); and
- Economic development, job creation (during construction and operation).

7.1.3 CUMULATIVE IMPACTS

- Incremental vegetation clearance and loss of habitat.

8. IMPACT ASSESSMENT CRITERIA

8.1 IMPACT IDENTIFICATION AND ASSESSMENT

The assessment criteria must clearly identify the environmental impacts of the proposed development. The environmental impacts identified will be quantified and the significance of the impacts assessed according to the criteria set out below. The EAP must make a clear statement, identifying the environmental impacts of the construction, operation and management of the proposed development. As far as possible, the EAP must quantify the suite of potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out below. Each impact will be assessed and rated. The assessment of the data must, where possible, be based on accepted scientific techniques, failing which the specialist is to make judgements based on his/ her professional expertise and experience.

For the purpose of assessing impacts the project will be divided into two phases from which impacting activities can be identified, namely:

- The **construction phase** (All constructed related activities on site, until the contractor leaves the site)
- The **operational phase** (All activities including the operation and maintenance of the dams)

8.2 APPROACH TO THE ASSESSMENT OF CUMULATIVE IMPACTS

Cumulative impacts can arise from one or more activities. A cumulative impact may result in an additive impact i.e., where it adds to the impact which is caused by other similar impacts or an interactive impact i.e., where a cumulative impact is caused by different impacts that combine to form a new kind of impact. Interactive impacts may be either countervailing (the net adverse cumulative impact is less than the sum of the individual impacts) or synergistic (the net adverse cumulative impact is greater than the sum of the individual impacts). Possible cumulative impacts of the project will be evaluated in this EIR.

8.3 ASSESSMENT CRITERIA

The potential negative, positive and cumulative environmental impacts of the Proposed Activity were assessed and the impact significance were determined using criteria as set out in the guideline document: DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

An assessment of the potential impacts is provided, identifying the impacts that are potentially significant and recommending management and mitigation measures to reduce the impacts.

In general, it is recognised that every development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, it is important that these possible risks are taken into account during the planning phase of the development. Risks and key issues were identified and addressed through an internal process based on similar developments, and an environmental evaluation.

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

The classes are rated as follows:

1) No significance
The impact is not substantial and does not require any mitigatory action.

2) Low
The impact is of little importance, but may require limited mitigation.

3) Medium
The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

4) High
The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

The assessment of the impacts was conducted according to a synthesis of criteria as set out below:

Extent The physical and spatial scale of the impact.	Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
	Site	The impact could affect the whole, or a significant portion of the site.
	Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
	National	The impact could have an effect that expands throughout the country (South Africa).
	International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
Duration The lifetime of the impact, that is measured in relation to the lifetime of the proposed development.	Short Term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.
	Short-Medium Term	The impact will be relevant through to the end of a construction phase.
	Medium Term	The impact will last up to the end of the development phases, where after it will be entirely negated.
	Long Term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.
	Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
Intensity Is the impact destructive or benign, does it destroy the impacted environment, alters its functioning, or slightly alter the environment itself?	Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
	Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
Probability The likelihood of	Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0%).

	Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.
	Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.
	Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.
	Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.

8.4 ALTERNATIVES TO BE ASSESSED

Based on the initial assessment of alternatives included in the Scoping Report, the following alternatives will be assessed in the EIR Phase:

- Alternative 1: Six Dams (Preferred Alternative)
- Alternative 2: Five Dams
- No-Go Alternative

8.4.1 MITIGATION AND MANAGEMENT

Mitigation measures should be recommended in order to enhance benefits and minimise negative impacts. The following will be addressed:

- Mitigation objectives;
- Recommended mitigation measures;
- Effectiveness of mitigations measures; and
- Recommended monitoring and evaluation programme.

9. IMPACT ASSESSMENT

The potential negative environmental impacts of the Proposed Activity were assessed and the impact significance were determined using criteria as set out in the guideline document: DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria. A key of numeric values and the formula used is provided below for ease of reference:

Probability:	**P**	**Duration:**	**D**
Definite	**5**	Permanent	**5**
Highly probable	**4**	Long-term (15 yrs until operation ceases)	**4**
Medium probability	**3**	Medium-term (5 - 15yrs)	**3**
Low probability	**2**	Short-term (0 - 5 yrs)	**2**
Improbable	**1**	Immediate	**1**
None	**0**		

Scale:	**S**	**Magnitude:**	**M**
International	**5**	Very high	**10**
National	**4**	High	**8**
Regional	**3**	Moderate	**6**
Local	**2**	Low	**4**
Site only	**1**	Minor	**2**
		None	**0**

Formula: **SP = (P+D+S) x M**

Significance:		
SP ≤ 30		**LOW**
SP 31 ≥ 60		**MEDIUM**
SP≥ 61		**HIGH**

SBM	=	Significance Before Mitigation
SAM	=	Significance After Mitigation

9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)

Potential Impact	Occurrence		Severity		Significance		Recommended Mitigation Measures
	P	D	S	M			
9.1.1 Potential impacts on soil and ground and surface water quality that may occur as a result of the spillage of hydrocarbons and hazardous chemicals.	**Alternative 1: Six Dams**						• Choice of site for the Contractor's storage area requires the ECO's approval and must consider ecologically sensitive areas, including flood and drainage lines. • A site plan/layout (indicating areas for storage of hazardous chemicals, ablution facilities, waste yards, etc.) must be submitted to the ECO for approval. • Storage areas must be designated, demarcated and fenced/secured (in the case of hazardous materials). • A walled concrete platform, dedicated store with adequate flooring or bermed (110% capacity) area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas. • Clear signage must be placed at all storage areas containing hazardous materials/substances. • Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible, the available MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes. • Storage of potentially hazardous materials should be above any 100-year flood line, or as agreed with the ECO. • Sufficient care must be taken when handling hazardous materials/substances to prevent pollution. Staff dealing with these hazardous materials/substances must be aware of their potential impacts and follow the appropriate safety measures. • Concrete or cement are not to be mixed on bare soil but only in a suitable mixing tray.
	4	2	1	8	SBM=	**56**	
	4	2	1	4	SAM=	**28**	
	Alternative 2: Five Dams						
	4	2	1	8	SBM=	**56**	
	4	2	1	4	SAM=	**28**	
	The **No-Go Alternative** will have no additional negative impact in terms of pollution of soil, surface and ground water quality.						

9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
						• All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site at a licenced hazardous waste site. • Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. • Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils; • Portable septic toilets are to be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage. • Portable septic toilets are to be located outside of the 1:100 year floodline. • Spilled hydrocarbons shall be treated with oil absorbent such as Drizit or similar and this material should be disposed at an approved waste site. • Topsoil or soil polluted by hazardous substances or cement should also be disposed at an approved waste site. • Emergency plans must be in place in case of spillages on the study site that could affect the study site as well as areas off-site. • In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately. • Any spillage, which may occur, shall be investigated and immediate action must be taken. This must also be reported to the ECO and depending on the severity reported to the LEDET as stipulated in the conditions of the Environmental Authorisation.

<table>
<tr><th colspan="8">9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)</th></tr>
<tr><th colspan="2" rowspan="2">Potential Impact</th><th colspan="6">Occurrence / Severity / Significance</th><th rowspan="2">Recommended Mitigation Measures</th></tr>
<tr><th>P</th><th>D</th><th>S</th><th>M</th><th colspan="2"></th></tr>
<tr><td colspan="2"></td><td colspan="6"></td><td>• Keep written records detailing the necessary information regarding the spill and remedial measures implemented. Such progress reporting is important for monitoring and auditing purposes and the written reports may afterwards be used for training purposes to prevent similar future occurrences.</td></tr>
<tr><td>9.1.2</td><td>Potential impacts on soil and ground and surface water quality that may occur as a result of the generation of waste.</td><td colspan="6">Alternative 1: Six Dams
4 | 2 | 1 | 8 | SBM= | 56
4 | 2 | 1 | 4 | SAM= | 28

Alternative 2: Five Dams
4 | 2 | 1 | 8 | SBM= | 56
4 | 2 | 1 | 4 | SAM= | 28

The No-Go Alternative will have no impacts in terms of pollution of soil, surface and ground water quality.</td><td>.
• The contractor must have a waste policy and waste management procedure and engage a service provider who trains the operations staff on measures for implementing the plan as well as auditing.
• Adequate waste management measures must be implemented preventing possible illegal dumping and littering of adjacent sensitive areas.
• Sufficient non-leachable refuse bins should be provided on site for construction crews. A zero-tolerance littering policy should be implanted by the various contractors.
• The excavation and use of rubbish pits are forbidden.
• A fenced area must be allocated for waste sorting and disposal.
• Individual skips for different types of waste should be provided.
• Conduct ongoing staff awareness programs so as to reinforce the need to avoid littering.
• Provide bins for construction workers and staff at appropriate locations, particularly where food is consumed.
• Waste bins should be cleaned out on a weekly basis by an appointed service provider to prevent any windblown waste and/or visual disturbance.
• The construction site should be cleaned daily and litter removed.</td></tr>
</table>

9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
						• Different waste bins, for different waste streams must be provided to ensure correct waste separation. Bins should be clearly marked and lined for efficient control and safe disposal of waste. • A fenced area must be allocated for waste sorting and disposal on the site. • General waste produced on site is to be collected in skips for disposal at the local municipal waste site. A waste disposal service provider must be appointed by the contractor to carry out disposal of waste as required. Hazardous waste is not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site. • Under no circumstances is waste to be burnt or buried on site. • A hazardous waste disposal certificate must be obtained from the waste removal company as evidence of correct disposal. • In the case of a spill of hydrocarbons, chemicals or bituminous substance, the spill should be contained and cleaned up and the material together with any contaminated soil collected and disposed of as hazardous waste to minimize pollution risk and reduce bunding capacity. • Reporting of spills and mitigation done must be done in accordance with section 10 of the minimum requirements for the handling, classification and disposal of hazardous waste (3rd edition, 2005). • Vehicles are to be checked for leakage before and after entering the construction area.

9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)							
Potential Impact	**Occurrence**		**Severity**		**Significance**		**Recommended Mitigation Measures**
	P	**D**	**S**	**M**			
9.1.3 Increased soil erosion as a result of vegetation clearance and increased stormwater runoff.	**Alternative 1: Six Dams**						• Earthworks associated with dam construction must take place as far as possible in the winter months as this is the driest period for this region. • All excess soil stockpile not taken off site or used to fix erosion issues, must be spread evenly over the disturbed areas and capped with topsoil, prior to rehabilitation and re-vegetation. • Construction areas must be rehabilitated to a land surface which integrates with the surrounding slope morphology and river channel form so as not to create areas of soil instability, or flow paths which incorrectly direct stormflows and floods, thereby causing scour, erosion and damage to adjacent habitats and infrastructure. • Areas subject to concentrated water flows during rainfall or high flow events must receive particular attention during rehabilitation and re-vegetation. Where possible these must be identified prior to commencement of construction activities. Where required, erosion protection structures may need to be designed and installed. • Artificial embankments, depressions and holes created by the construction activity must be contoured/rehabilitated to minimize risk to, and death of, all fauna types from large mammals to small invertebrates. • Upon site closure all infrastructure, foreign materials, waste, litter and contaminated water, rock or soil must be removed from site and disposed of in accordance with best environmental practice. • In riparian areas, backfilling should occur as soon as possible, with soil compaction undertaken and shaping to original levels. • All disturbed areas are to be rehabilitated, with the wetland and riparian habitat at the dam construction points and areas where
	4	2	3	8	SBM=	**72**	
	4	2	3	6	SAM=	**54**	
	Alternative 2: Five Dams						
	4	2	3	8	SBM=	**72**	
	4	2	3	6	SAM=	**54**	
	The **No-Go Alternative** will not lead to potential additional erosion and an increase in stormwater runoff.						

9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
						disturbance has resulted from excavation being restored to near-natural conditions. This must be implemented immediately following completion of construction activity at each dam area. • The cleared area should be rehabilitated to ensure that no barriers exist within the area and that habitat is comparable to the natural or, at a minimum, preconstruction state. • Re-vegetation and rehabilitation must take place at worked sections immediately following completion so that vegetation can re-establish as quickly as possible. • Within, and in proximity to wetland areas, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species and dominance by ruderal species. • Simple re-vegetation with terrestrial species will not be suitable. Correct species for riparian and wetland habitats of the region must be re-established in consultation with an appropriately qualified specialist (e.g., botanist/vegetation ecologist). • Progress of vegetation establishment must be monitored regularly, with slow recovery requiring intervention to ensure site recovery and integrity, as well as physical stability. • Vehicle access tracks, footpaths and other areas of soil compaction and vegetation denudation as a result of the construction activities must be appropriately contoured, scarified and re-vegetated where required. • Any soil stockpile sites and sites of excavation must also be rehabilitated in the same fashion. Rehabilitation of such sites must be monitored, and the results reported to the ECO.

9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)

Potential Impact	Occurrence		Severity		Significance		Recommended Mitigation Measures
	P	D	S	M			
9.1.4 Potential impacts on vegetation and loss of habitat	**Alternative 1: Six Dams**						• Vehicles should only use designated roadways to access the site. • Have a biodiversity protocol and rehabilitation plan in place that will be implemented upon closure. • Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented • The ecological footprint of the proposed development should be restricted to the approved (less sensitive) area. • Areas outside the area of the proposed development should not be cleared. • Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented • Effective alien invasive plant management and eradication measures should be implemented on an ongoing basis. • Implement effective rehabilitation measures upon closure. • Minimise development footprint and habitat transformation, rehabilitate with indigenous flora and reserve indigenous vegetation throughout as far as possible • Reserve indigenous vegetation wherever possible. Avoid vegetation clearance during the breeding season. • Use designated roads to access the site. Rehabilitate unused areas with indigenous flora. • Minimise development footprint and habitat transformation, limit ongoing human activity to the minimum required for ongoing operation, control noise to minimum, rehabilitate with native
	4	2	3	10	SBM=	**90**	
	4	2	3	6	SAM=	**54**	
	Alternative 2: Five Dams						
	4	2	3	8	SBM=	**72**	
	4	2	3	6	SAM=	**54**	
	The **No-Go Alternative** will imply that no additional vegetation will be cleared and the indigenous vegetation and habitat will remain intact.						

9.1 CONSTRUCTION PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
						vegetation and retain indigenous vegetation throughout as far as possible, limit roadways and vehicle speeds; rehabilitate thoroughly post-decommissioning with locally native species

9.2 CONSTRUCTION PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)							
Potential Impact	**Occurrence**		**Severity**		**Significance**		**Recommended Mitigation Measures**
	P	**D**	**S**	**M**			
9.2.1 Impacts on ambient air quality (dust and noise generation).	**Alternative 1: Six Dams**						*Air Quality* • Implement a programme of stakeholder communication that includes community engagement before and during work on site. • Provide a complaint register on site where complaints can be made. This register should enable effective communication of complaints details of steps taken to resolve complaints. • Clearly display the contact details of the environmental site office and manager at the site entrance. • Weekly site inspections should be undertaken in the vicinity of sensitive receptors. Records should be made of these routine inspections. • Implement and maintain a Dust and Emission Management Plan which provides clear details on preventing, maintaining and improving the air quality in terms of site-specific activities. This plan could possibly incorporate a dust fallout monitoring programme should it be evident that dust emissions is a problem. • Should activities be undertaken during dry and windy conditions, special focus must be taken on the impact and results of the conditions to ensure that minimal impact is occurring.
	4	2	3	6	SBM=	**48**	
	4	2	3	2	SAM=	**18**	
	Alternative 2: Five Dams						
	4	2	3	6	SBM=	**48**	
	4	2	3	2	SAM=	**18**	
	The **No-Go Alternative** will not lead to elevated levels of construction related traffic.						

9.2 CONSTRUCTION PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
						• Should the conditions require it, erect screens and barriers around the sensitive receptors. • Ensure that all areas, fencing, barriers and scaffolding is kept clear of debris and dust. • Ensure that all vehicles are maintained in good working condition and that they are services on regular intervals. • Ensure that all vehicles are switched off when stationary- no vehicles should be idling for extended period. • Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable. • Impose and regulate a speed limit of 30 km/h on the site at all times. • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust particulate matter suppression (non-potable water) where possible. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. • Only use registered waste carriers to take waste off-site. • Bonfires and burning of waste materials is prohibited. • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with

9.2 CONSTRUCTION PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
						topsoil, as soon as practicable. Only remove the cover in a small area during work and not all at once. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in appropriate storage with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. • Use water-assisted dust sweeper(s) on the access and local roads, to remove, as soon as practicable any material tracked out of the site. This may require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport • Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as practicable

9.2 CONSTRUCTION PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
						Noise: • Construction site yards and other noisy fixed facilities should be located well away from noise sensitive areas adjacent to the development site. • All construction vehicles and equipment are to be kept in good repair. • Where possible, stationary noisy equipment (for example compressors, pumps, pneumatic breakers,) should be encapsulated in acoustic covers, screens or sheds. Proper sound insulation can reduce noise by up to 20dBA. • Portable acoustic shields should be used in the case where noisy equipment is not stationary (for example drills, angle grinders, chipping hammers, poker vibrators). • Construction activities should be limited to 07:00 to 17:00 daily. • Machines in intermittent use should be shut down in the intervening periods between active working or throttled down to a minimum. • In general, construction activities should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993). • Construction staff working in areas where the 8-hour ambient noise levels exceed 75dBA should wear ear protection equipment.

9.2 CONSTRUCTION PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)

Potential Impact	Occurrence		Severity		Significance		Recommended Mitigation Measures
	P	D	S	M			
9.2.2 Change in the visual character of the area.							• Locate the construction camps in areas that are already disturbed or where it is not necessary to remove established vegetation; • Exposed soil must be covered or 'camouflaged' using a biodegradable soil mat and vegetation cover to reduce the duration of visible scarring of the landscape; • Retain the existing vegetation cover of the site through selective clearing, where practical; • Dust suppression techniques should be implemented especially on windy days, preferably using biodegradable binding agent; • Remove rubble and other construction rubbish off site as soon as possible or place it in containers in order to keep the construction site free from additional unsightly elements; • Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; and • Monitor all areas for rehabilitation failure and implement remedial action immediately.
	Alternative 1: Six Dams						
	4	2	3	6	SBM=	**48**	
	4	2	3	2	SAM=	**18**	
	Alternative 2: Five Dams						
	4	2	3	6	SBM=	**48**	
	4	2	3	2	SAM=	**18**	
	The **No-Go Alternative** will not lead to a change in the visual character of the area.						
9.2.3 Potential impacts on existing cultural and heritage resources.							• The discovery of previously undetected subterranean heritage remains on the terrain must be reported to the Limpopo Heritage Authority or the archaeologist, and may require further mitigation measures.
	Alternative 1: Six Dams						
	2	5	1	4	SBM=	**32**	
	2	5	1	2	SAM=	**16**	
	Alternative 2: Five Dams						
	2	5	1	4	SBM=	**32**	
	2	5	1	2	SAM=	**16**	

<table>
<tr><th colspan="8">9.2 CONSTRUCTION PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)</th></tr>
<tr><th colspan="2" rowspan="2">Potential Impact</th><th colspan="6">Occurrence / Severity / Significance</th><th rowspan="2">Recommended Mitigation Measures</th></tr>
<tr><th>P</th><th>D</th><th>S</th><th>M</th><th colspan="2"></th></tr>
<tr><td colspan="2"></td><td colspan="6">The No-Go Alternative will not lead to impacts on existing cultural and heritage resources.</td><td></td></tr>
<tr><td>9.2.4</td><td>Potential impacts on traffic in the area.</td><td colspan="6">Alternative 1: Six Dams
2 | 5 | 1 | 4 | SBM= | 32
2 | 5 | 1 | 2 | SAM= | 16

Alternative 2: Five Dams
2 | 5 | 1 | 4 | SBM= | 32
2 | 5 | 1 | 2 | SAM= | 16

The No-Go Alternative will not lead to elevated levels of construction related traffic.</td><td>• Place adequate advance warnings (Turning Trucks).
• Manage the increase in construction traffic in terms of congestion, road surface damage, safety concerns, dust and erosion.
• All vehicular traffic on site should adhere to road safety measures;
• All vehicles should be road worthy;
• Only designated roads should be used for construction vehicles; and
• Ensure drivers and operators of equipment are familiar with the safety policies and regulations.</td></tr>
</table>

9.3 OPERATIONAL PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)

Potential Impact	Occurrence		Severity		Significance		Recommended Mitigation Measures
	P	D	S	M			
9.3.1 Potential impacts on soil and ground and surface water quality that may occur as a result of the spillage of hydrocarbons and hazardous chemicals.	**Alternative 1: Six Dams**						• All maintenance vehicles should be kept in good working condition; • Spilled hydrocarbons shall be treated with oil absorbent such as Drizit or similar and this material should be disposed at an approved waste site. • All maintenance vehicles should be parked in demarcated areas when not in use and drip trays should be placed under vehicles to collect any spillages/ leaks; • In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately. • Only species which are endemic should be used in landscaping to promote water conservation and biodiversity resilience.
	3	5	2	4	SBM=	**40**	
	3	5	2	2	SAM=	**20**	
	Alternative 2: Five Dams						
	3	5	2	4	SBM=	**40**	
	3	5	2	2	SAM=	**20**	
	The **No-Go Alternative** will have no additional negative impact in terms of pollution of soil, surface and ground water quality.						
9.3.2 Increased soil erosion as a result of vegetation clearance and increased stormwater.	**Alternative 1: Six Dams**						• Vehicular and pedestrian movement must be limited to the established roads and footpaths. • If any signs of erosion occur in high trafficked areas or as a result of concentrated flow of stormwater runoff these areas should be rehabilitated according to instructions from a qualified Ecologist. • All faunal alien invasive species should be replaced with indigenous (to the area) faunal species. Introduced indigenous faunal species must be sourced from a local nursery in order to prevent possible genetic contamination.
	3	5	2	10	SBM=		
	3	5	2	6	SAM=	**60**	
	Alternative 2: Five Dams						
	3	5	2	8	SBM=	**80**	
	3	5	2	6	SAM=	**60**	
	The **No-Go Alternative** will imply that the flow regime remains un-altered and no additional erosion and/or siltation will take place.						

9.3 OPERATIONAL PHASE NEGATIVE IMPACTS (BIOPHYSICAL IMPACTS)

Potential Impact	Occurrence		Severity		Significance		Recommended Mitigation Measures
	P	D	S	M			
9.3.3 Potential impacts on the availability of surface water generated by stormwater run-off (This impact is inherent to the proposed project. Surface water flow is limited to the rain season as the dams is constructed in a non-perennial stream. The flow of the non-perennial streams is limited due to topography and catchment of the streams).	**Alternative 1: Six Dams**						• Any downstream water users that experiences lower stormwater runoff volumes as a result of the proposed dams must be supplied with water from the relevant dam(s) through controlled releases.
	3	5	2	8	SBM=	**80**	
	3	5	2	6	SAM=	**60**	
	Alternative 2: Five Dams						
	3	5	2	8	SBM=	**80**	
	3	5	2	6	SAM=	**60**	
	The **No-Go Alternative** will imply that no impeding of surface water runoff.						

9.4 OPERATIONAL PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)

Potential Impact	Occurrence		Severity		Significance		Recommended Mitigation Measures
	P	D	S	M			
9.4.1 Change in the visual character of the area.	**Alternative 1: Six Dams**						• Re-vegetate all earth dam walls.
	3	5	2	4	SBM=	**40**	
	3	5	2	2	SAM=	**20**	
	Alternative 2: Five Dams						
	3	5	2	4	SBM=	**40**	
	3	5	2	2	SAM=	**20**	

9.4 OPERATIONAL PHASE NEGATIVE IMPACTS (SOCIO-ECONOMIC IMPACTS)						
Potential Impact	**Occurrence**		**Severity**		**Significance**	**Recommended Mitigation Measures**
	P	**D**	**S**	**M**		
	The **No-Go Alternative** will not alter the visual character of the landscape in any way.					

9.4.2 CUMULATIVE IMPACT

The Proposed Activity will result in the cumulative loss of indigenous vegetation and associated faunal habitat as a result of the construction of the proposed Dams. The Ecological Assessment however revealed that the bushveld has been modified through cultivation of citrus fruits and only a small, disconnected fragments of natural vegetation remain. No sensitive floral or faunal species were observed within the proposed dam footprint areas. All of the recorded species are of low sensitivity as they are mostly widespread species. There were no objections from the appointed Ecologist for the construction of the six in-stream dams to continue.

9.4.3 POSITIVE IMPACTS

The ART employs approximately 400 permanent staff members as well as 1500 seasonal workers during the picking season. The Letaba Estates produces approximately 65 000 tons citrus annually and the LCP processing plant (incorporated in ART) processes close to 100,000 tons off fresh fruit per year.

While the proposed dams will result in temporary employment during the construction period, the dams will also enable the Applicant to augment the current storage volume of the farm in order to store and utilise their full water allocation from the canal. This will ensure that production and the large contribution to the local agriculture and agro-processing industry can continue uninterruptedly during times of water scarcity.

10. ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMPr informs the Applicant and the technical team of the guidelines which will need to be followed during construction to ensure that there are no lasting or cumulative negative impacts of the construction process on the environment. This includes:

- The standards and guidelines that must be achieved in terms of environmental legislation;
- Mitigation measures and environmental specifications which must be implemented for all phases of the project to minimise the extent of environmental impacts, to manage environmental impacts and where possible to improve the condition of the environment;
- Guidance through method statements that are required to be implemented to achieve the environmental specifications;

- Corrective actions that must be taken in the event of non-compliance with the specifications of the EMPr; and
- Measures to prevent long-term or permanent environmental degradation.

11. EAP'S RECOMMENDATION

11.1.1 COMPARATIVE ASSESSMENT OF ALTERNATIVES

Although a number of potential short and long-term environmental and social impacts can be expected during the construction and operational phases of the Proposed Activity, it was found that the significance of these impacts could be reduced through the successful implementation of appropriate mitigation measures. Refer to **Table 9** for a comparative assessment of alternatives. Alternative 1 is preferred over Alternative 2 for the following reason:

Alternative 1 includes 6 dams instead of 5 dams. The farm's storage capacity will be maximised if all six dams are implemented. This will increase production during the dry season which will have a positive impact on the economy and employment. The ecological assessment revealed that all areas earmarked for the dams are partially transformed and contains no sensitive species. The farm's production capability and the ability to irrigate in the dry season can therefore be maximised without compromising the environment.

Table 9: Comparative Assessment of Impact Significance After Mitigation

Construction Phase Impacts	Significance after Mitigation	
	Alternative 1	Alternative 2
Potential impacts on soil and ground and surface water quality that may occur as a result of the spillage of hydrocarbons and hazardous chemicals.	**Low**	**Low**
Potential impacts on soil and ground and surface water quality that may occur as a result of the generation of waste.	**Low**	**Low**
Increased soil erosion as a result of vegetation clearance and increased stormwater runoff from hard surface	**Medium**	**Medium**
Potential impacts on vegetation and loss of habitat	**Medium**	**Medium**

Construction Phase Impacts	Significance after Mitigation	
	Alternative 1	Alternative 2
Impacts on ambient air quality dust and noise generation	Low	Low
Change in the visual character of the area	Low	Low
Potential impacts on existing cultural and heritage resources	Low	Low
Potential impacts on traffic	Low	Low
Job creation	High Positive	

Operational Phase Impacts	Significance after Mitigation	
	Alternative 1	Alternative 2
Potential impacts on soil and ground and surface water quality that may occur as a result of the spillage of hydrocarbons hazardous chemicals.	Low	Low
Increased soil erosion as a result of vegetation clearance and increased stormwater runoff from hard surface	Medium	Medium
Impacts on ambient air quality dust and noise generation	Low	Low
Change in the visual character of the area	Low	Low
Potential impacts on traffic	Low	Low
Potential impacts on the availability of surface water generated by stormwater run-off	Medium	Medium
Job creation	High Positive	
Increasing water storage on the farm	High Positive	

11.1.2 EAP'S STATEMENT

The proposed development is supporting an existing market of citrus fruit export and will ensure that there will be enough water for irrigation during the dry season and when natural disasters (such as drought) strike. The establishment of the six-dams therefore supports

growth in the agriculture industry. While there is a need for economic and social development, all of the impacts have to be taken into consideration in order to ensure the long-term sustainability of the proposed project.

The proposed project will form part of the existing irrigation network, fed by the Letaba North irrigation canal, with its source being the Letaba River located directly south of the relevant properties. The proposed dams will receive water from the irrigation canal through controlled releases, as well as a small amount of surface runoff water during the wet season. No new abstraction from the river, canal or borehole will be required to supply the dams with water.

The proposed activity will therefore be constructed on sustainable principles and also promote sustainability. A number of mitigation measures will be implemented during the construction as well as the operational phases to ensure that the impact on the environment is as low as possible.

The Biodiversity Impact Assessment by Mora Ecological Services is in support of the proposed project and the impacts on the biodiversity is rated at a low impact. The Aquatic Impact Assessment contains a risk assessment which rated the risk of each dam as Moderate. No fatal flaws in terms of cultural heritage and/or palaeontology could be identified. An engineering report on the feasibility and practicality of the dams was done by PG Engineers and the proposed six dams are assessed as a feasible project.

The EAP recommends that Alternative 1 should be authorised by LEDET as this option will maximise the water storage capacity of the farm and the irrigation of the citrus orchards will be able to continue uninterrupted during the dry season. The applicant will therefore be able to able to utilise a higher percentage of water allocated to them form the Letaba Water User Association (LWUA) instead of water just flowing downstream along the canal. The resulting impacts from the six dams is only slightly higher than the impacts of five dams and the authorisation of the six dams will ensure that the maximum water storage capacity will be available for the storage of the allocated water from the Letaba North irrigation canal.

Should Environmental Authorisation for the proposed In Stream Storage Dams be granted, by LEDET, it should be subject to the following conditions:

- All mitigation measures in **Section 9** of the EIR and recommendations made by the specialist studies (**Annexure F**) should be adhered to during the Construction and Operational Phases of the development;

- All recommendations and mitigation measures in the Environmental Management Programme (EMPr) and Mitigation Plans (**Annexure H**) should be complied with and monitored during the Pre-Construction, Construction as well as the Operational Phases;
- An Environmental Control Officer (ECO) must be appointed during the construction phase to ensure environmental compliance; and
- A Water Use Licence must be obtained for all dams from the Department of Water and Sanitation

12. CONCLUSION

In conclusion, the purpose of a Scoping & Environmental Impact Reporting (S&EIR) process is to evaluate the impact of the proposed development on the receiving biophysical and socio-economic environments and to propose mitigation measures that can reduce these impacts once implemented in the planning, construction as well as the operational phases. This ensures that the proposed project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

Although a number of potential short and long-term environmental and social impacts can be expected during the construction and operational phases of the proposed development of six in-stream storage dams, it was determined in the Draft EIR that the significance of these impacts could be reduced through the successful implementation of appropriate mitigation measures.

Comments and/or concerns identified by Interested and Affected Parties (I&APs) during the review period of the Draft EIR will be incorporated into the Final EIR for further investigation. The Final EIR phase will be submitted to the registered I&AP's for consideration and to LEDET for decision-making. All comments on the Final EIR will also be forwarded to the LEDET for consideration.

13. REFERENCES

- Greater Tzaneen Local Municipality Integrated Development Plan (IDP) (2022 – 2023)
- Integrated Environmental Management Information Series, Department of Environmental Affairs and Tourism, 2002
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- National Development Plan (NDP) – 2030
- Polygon Environmental Planning Scoping Report for the proposed establishment of two dams at Letaba Estates, Tzaneen, Limpopo Province (2017)
    - Proposed construction of a dam at Letaba Estates, Limpopo Province Wetland/Riparian Delineation and Functional Assessment, September 2017;
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    - Desktop Aquatic Assessment: for the proposed expansion of three existing instream balancing dams on the Remaining Extent of the farm Letaba Estates 525 LT near Tzaneen, Limpopo Province, South Africa, March 2020;
    - Hydrological Study for the Proposed Raising of Three Dams at Letaba Estates, February 2022
- WaziMap (https://wazimap.co.za/profiles/ward-93303017-greater-tzaneen-ward-17-93303017/)
- Proposed Construction of six in-stream storage dams at Letaba Estate 525 and Portion 0 of the Farm Beaconsfield 530 LT, Mopani District, Limpopo, Aquatic Impact Report, November 2022
- Terrestrial Biodiversity Study: Proposed Construction of Six In-Stream storage dams at Letaba Estate 525 LT and Portion 0 of the Farm Beaconsfield 530 LT, Mopani District, Limpopo