Appendix D – Specialist reports

- Site Verification Report
- Visual Impact Specialist Report
- Archaeological & Palaeontological Specialist Report
- Terrestrial Biodiversity, Plant & Animal Species Specialist Report
- Aquatic Biodiversity Compliance Statement

DEDEAT REF: ECm1/C/LN1&3/M/05-2024

Site Sensitivity Verification Report

Proposed expansion of the existing Port Elizabeth Rifle and Pistol Club located in Greenbushes, Port Elizabeth, Eastern Cape Province

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1. INTRODUCTION

The Port Elizabeth Rifle and Pistol Club (PERPC) wishes to expand their existing shooting range in Greenbushes to allow for additional rifle and pistol ranges while at the same time merging the existing rifle range with the existing pistol range that is located approximately 1 km away on the property.

1.1 Project location

BlueLeaf Environmental Consulting (Pty) Ltd (BlueLeaf) has been appointed by the PERPC to undertake a Basic Environmental Assessment as regulated by the National Environmental Management Act (No. 107 of 1998) (NEMA as amended) for the proposed expansion of the existing rifle and pistol ranges located in Greenbushes, Port Elizabeth (Figure 1.1). As per the legislative requirements, an application must be submitted with the Provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) located in Port Elizabeth, Eastern Cape.

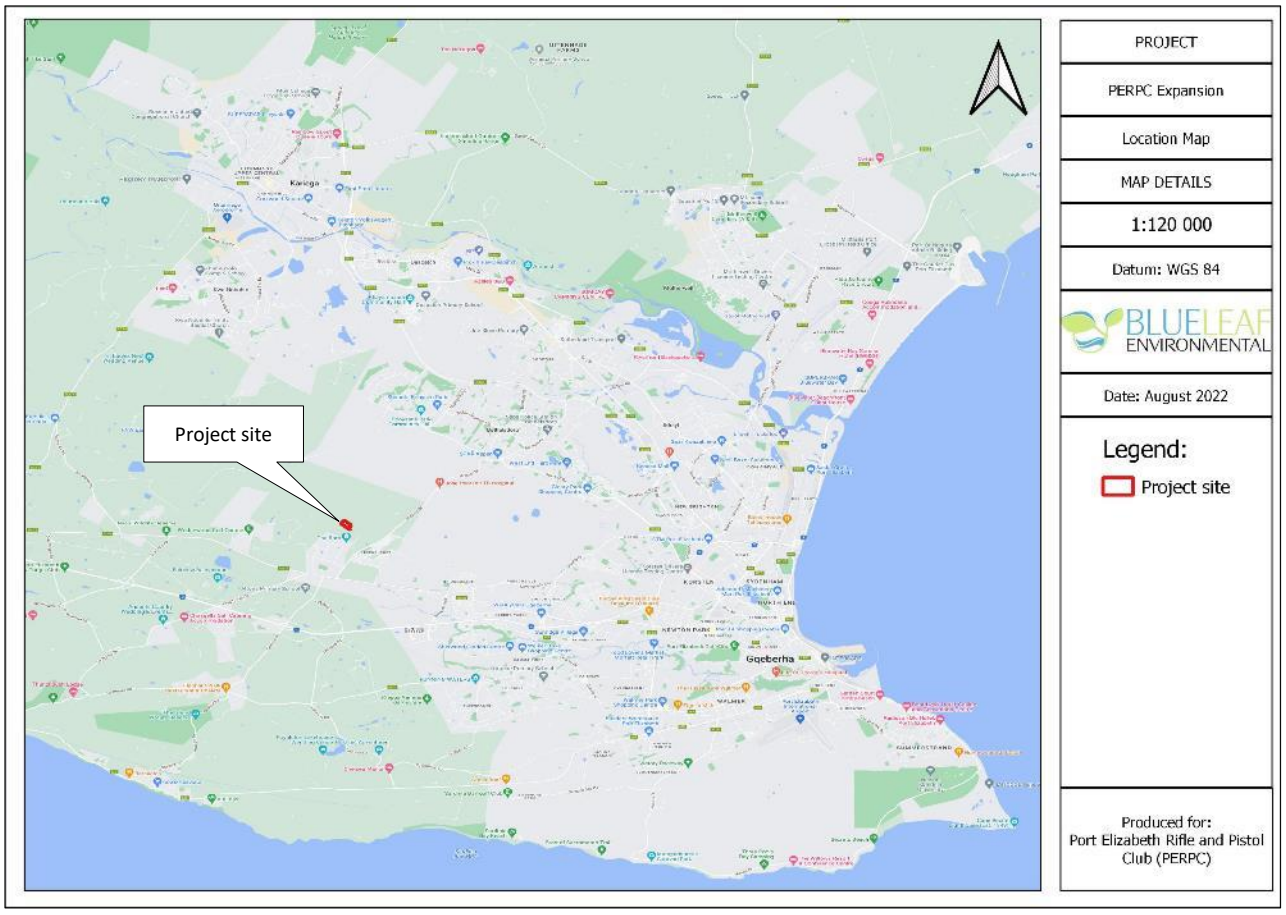

Figure 1.1: Location of the proposed PERPC expansion in Port Elizabeth.

Table 1.1 provides a list of point coordinates for the location of the proposed expansion area on the property.

Table 1.1: Coordinate point for the site location

#	Latitude	Longitude
1.	33° 54.413'S	25° 25.865'E

1.2 Project description

The existing rifle and pistol ranges are situated in 2 separate nodes. The larger rifle range is located on Portion 5 of Erf 8, covering an area of 4.3 ha while the existing pistol range is located on Portion 6 of Erf 8, covering a smaller area of 1.1 ha located approx. 600 m to the northeast of the rifle range. All office and storage infrastructure are located at the smaller pistol range and will be relocated to the proposed new range. An existing 1.4 km long gravel road (approx. 3.5 m wide) connects the rifle and pistol ranges while an additional 400 m links it to the property entrance. Approx. 1.2 km of this road will not be used by club member after the expansion.

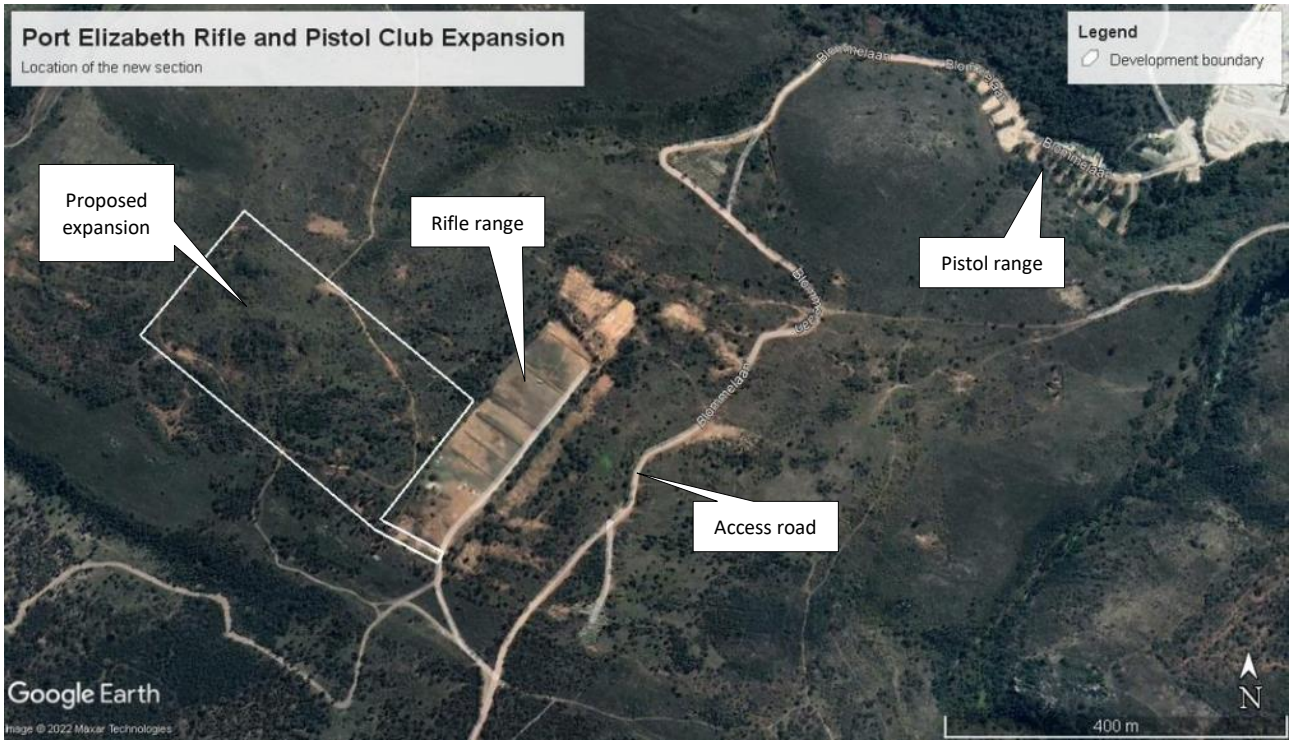

Figure 1.2: Layout of the existing and proposed new layouts at the PERPC in Greenbushes.

The expansion will be adding 6.7 ha to the existing 5.3 ha of land used by the club, doubling the clubs range areas. However, keep in mind that the 1.1 ha pistol range will be rehabilitated to natural vegetation and will no longer be used by the Club (Table 1.1).

Table 1.1: Development sizes before and after the proposed new expansion.

Development area	Existing size	New size
Rifle range	4.3 ha	4.3 ha
Pistol range	1.1 ha	0 ha
New expansion	0 ha	6.7 ha
Road	1.8 km	500 m
TOTALS	**5.5 ha & 1.8 km**	**11 ha & 500 m**

The remainder of the property is unused and will remain covered by natural vegetation. There is a high degree of Wattle and Gum trees (alien invasives) which is being illegally harvested in the area. The entire erf is currently fenced, and access is controlled by remote. Old soil stockpiles were observed in the expansion area as the site was historically mined for sand, but the natural vegetation has since regrown.

The proposed expansion will consist of the following infrastructure (Figure 1.3):

- 4 x (25m x 50m) ranges.
- 2 x (25m x 115m) ranges.
- 12 x (25m x 25m) ranges.
- 1 x (50m x 70m) space for offices and storage containers
- Approx. 900m of new road, 3m wide
- A firebreak surrounding the entire expansion.

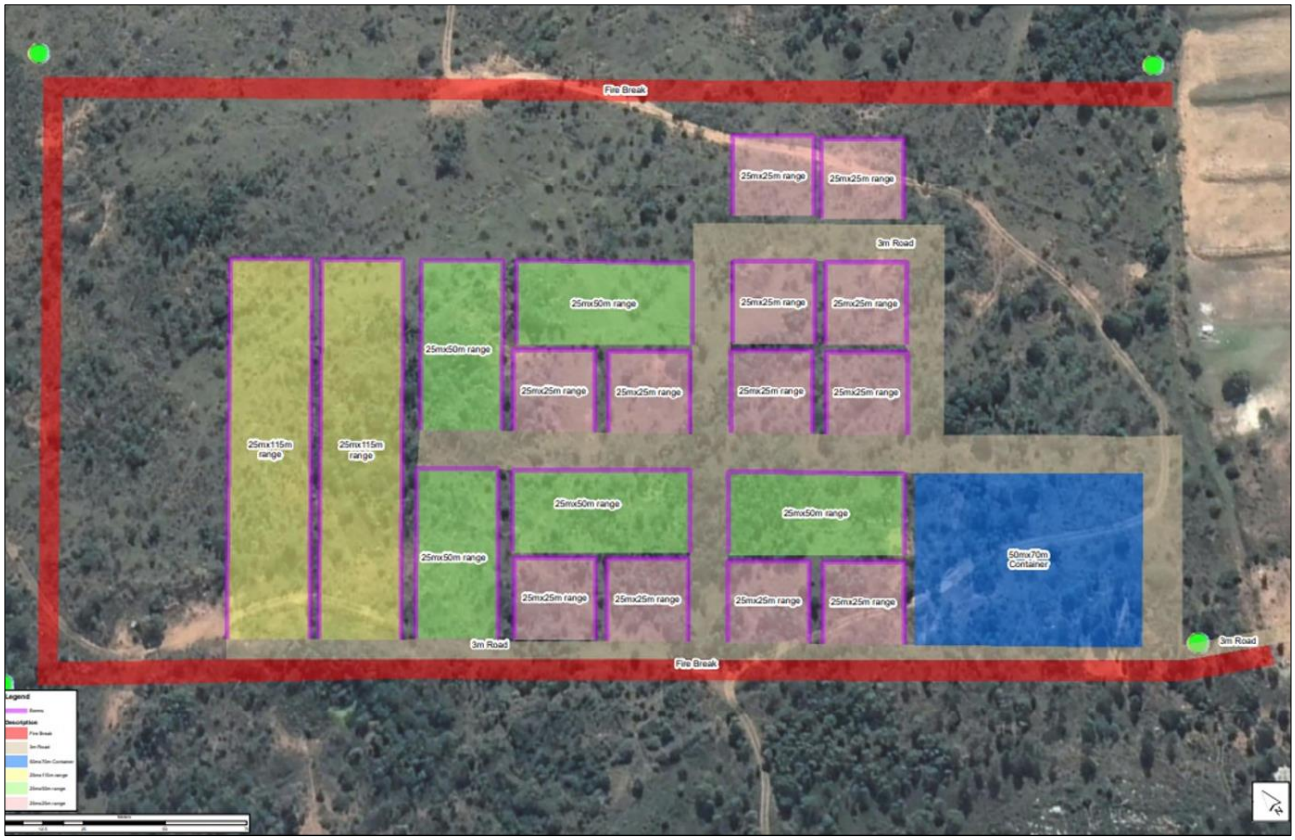

Figure 1.3: Proposed layout of the expansion section.

1.3 Purpose of this report

A Screening Tool Report was generated as part of the EIA application process. According to the Screening Tool Report, the following specialist assessments were identified and recommended to be undertaken as part of the environmental process:

1. Landscape/Visual Impact Assessment.
2. Archaeological and Cultural Heritage Impact Assessment.

3. Palaeontology Impact Assessment.
4. Terrestrial Biodiversity Impact Assessment.
5. Aquatic Biodiversity Impact Assessment.
6. Socio-economic Impact Assessment.
7. Plant Species Impact Assessment.
8. Animal Species Impact Assessment.

In accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA, this Site Sensitivity Verification Report has been compiled to provide a rationale for the specialist studies undertaken as part of the environmental process.

2. DESKTOP ANALYSIS

2.1 Current land use

Current land use has been determined and the map in Figure 2.1 shows that almost the entire study site is covered by transformed natural vegetation dominated by wattle and gum woodlots. These atrea have been transformed as a result of historical surface mining (probably for sand and gravel). Intact endemic vegetation can be found on a small portion (1.65 ha) within the proposed expansion site.

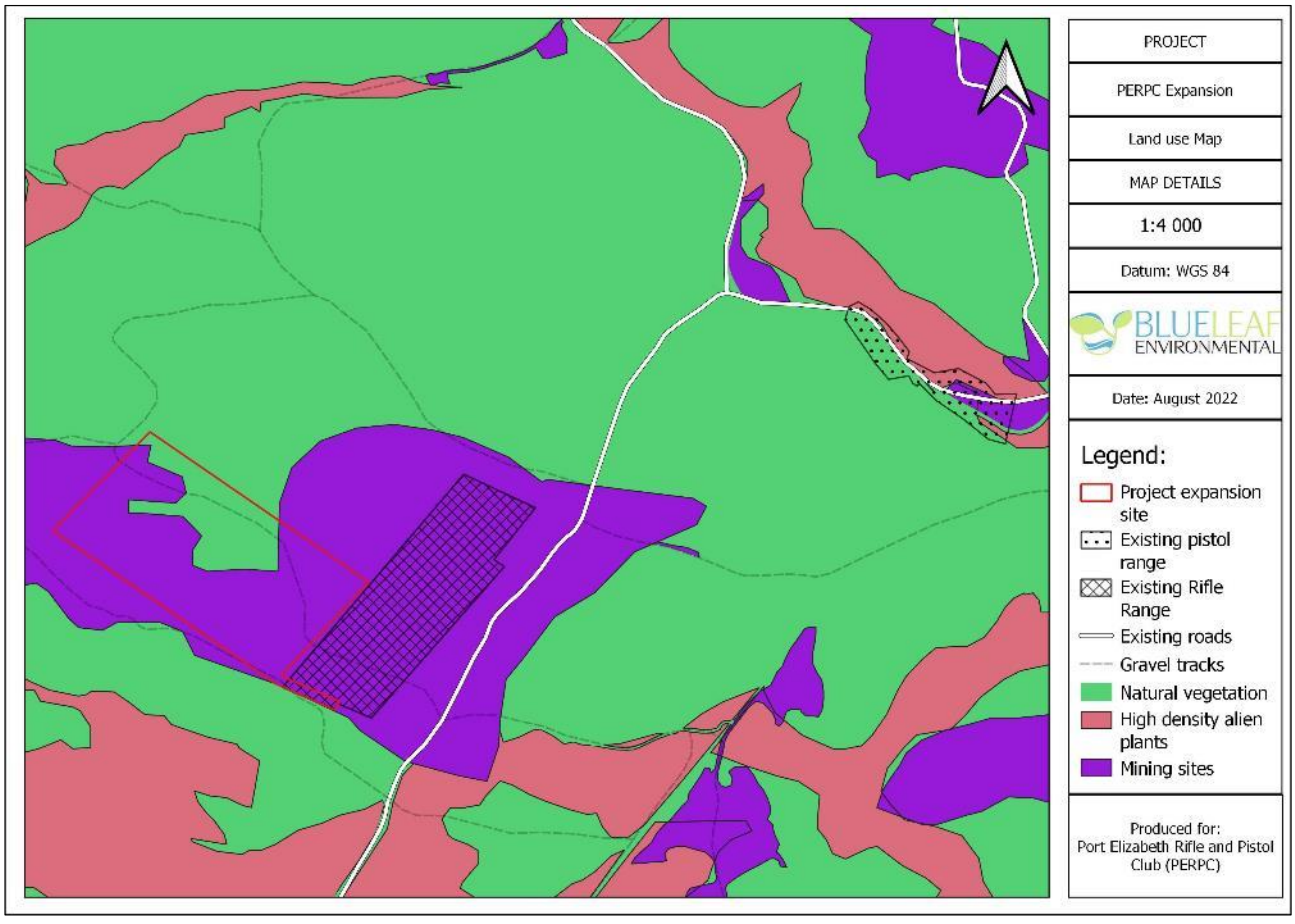

Figure 2.1: Land use of the PERPC site and surrounding areas

2.2 Surface water

No wetlands occur on site or within 500 m of the expansion site boundary.

No rivers or streams are in or within 100 m of the study site. The nearest river, the Chatty River, is located 290 m to the west. This is a non-perennial river with a NFEPA classification of Class E – F (Not an acceptable classification). This river will not be impacted by the proposed expansion.

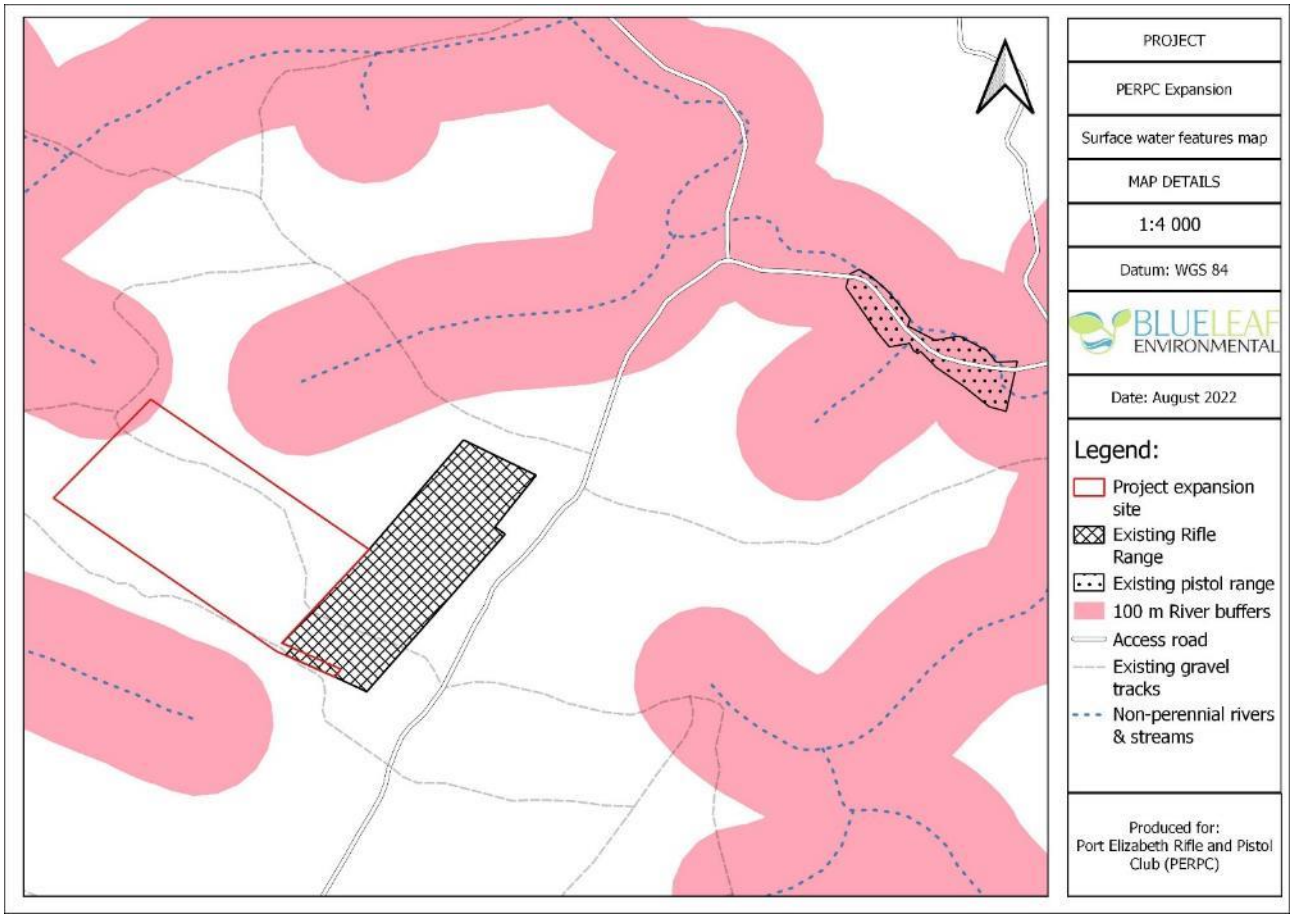

Figure 2.2: Aquatic features near the proposed expansion area.

2.3 Vegetation

The national vegetation classification system called the SANBI VegMap (2018) identifies two (2) vegetation types within the PERPC expansion site namely Algoa Sandstone Fynbos and Bethelsdorp Bontveld (Figure 2.3).

Algoa Sandstone Fynbos occurs on coastal flats in the port Elizabeth area. Vegetation supports grassy shrubland (mainly graminoid fynbos) with grasses dominating in wet habitats. SANBI classifies this vegetation as **critically endangered** with about only 2% conserved in the Van Stadens Wild Flower Reserve and some other private nature reserves. More than 50% has been transformed already through cultivation and urban sprawl of the Metro). Up to 80% of the proposed PERPC extension land area is covered by this vegetation type.

Bethelsdorp Bontveld forms part of the Albany Thicket biome and is found on steep slopes of deeply incised valleys. It consists of a mosaic of low thicket (2 - 3 m in height) consisting of bush clumps in a matrix of low, succulent-rich shrubland comprising of renosterveld and succulent karroid elements. Several of the tree and shrub species that make up the bush clumps (e.g. *Smelophyllum capense*) are shared with Baviaans Valley Thicket. SANBI classifies this vegetation as **least concerned.**

Figure 2.3: SANBI vegetation types listed in and near the proposed expansion area.

2.4 Animals

No animal species were observed within the study site upon site visit, but the Screening Report lists various animal SCC that may occur in the area. The chances of any of these animals occurring on site is very low. The site is highly degraded with little habitat or food sources remaining for most of the listed species. This site is also immediately adjacent to an existing rifle shooting range. These ranges do make a lot of loud noises making the area unsuitable for most animal species.

2.5 Biodiversity

According to the Nelson Mandela Bay Metropolitan Biodiversity Conservation Plan (2014), half of the proposed expansion site (approx. 3.4 ha) is in a ESA2 area while the remainder is in a CBA1 (Figure 2.4). Half of the proposed expansion site (approx. 3.4 ha) is in a ESA2 area while the remainder is in a CBA1 (Figure 2.4). A site visit has confirmed that most of the site is completely transformed through previous sand mining while only a small area with degraded fynbos remains.

Figure 2.4: The NMB Conservation Plan map showing the biodiversity status of the study site

3. SITE ASSESSMENT

A site visit was conducted on the 5th of October 2022. The following was observed:

1. The entire area is covered by vegetation. Most of the vegetation is dense alien trees (wattle) with a small area next to the existing range containing some fynbos species interspersed between the wattle trees.
2. Some sensitive plants were observed.
3. Most of the area is completely transformed through what looks like previous surface sand mining. The remainder is degraded fynbos. No intact Algoa Sandstone Fynbos was observed.
4. No wild animals were observed but potential habitats for reptiles exist.
5. The site falls within a CBA and ESA2. After the site visit it was confirmed that only 24 % (1.65 ha) is considered as CBA while the remainder is ESA2.

Below is a photo sequence of the study site and surroundings:

Dense wattle woodlots occur with little to no underbrush:




Soil stockpiles surrounded by dense wattle lots occur:

Wattle is illegally harvested on site:

4. RATIONALE FOR REQUIRED SPECIALIST STUDIES

Below is rationale for each of the specialist assessments listed in the Screening Report:

4.1 Landscape/Visual Impact Assessment

A landscape/visual specialist assessment will be undertaken in line with the recommended protocol and will inform the BAR.

4.2 Archaeological and Cultural Heritage Impact Assessment

Archaeology has been ranked as low sensitivity in the study area by the screening report. It is therefore the opinion of the consultant that an Archaeological Specialist Impact Assessment is not required. A specialist was still approached to draft a compliance statement. His recommendations will be included in the BAR/EMPr. Comments will be obtained from the relevant heritage resource authorities (SAHRA and ECPHRA).

4.3 Palaeontology Impact Assessment

Palaeontology has been ranked as high sensitivity by the screening report. A Specialist has been approached who reclassified the theme as medium sensitive. He will be drafting a compliance statement for this theme. His recommendations will be included in the BAR/EMPr. Comments will be obtained from the relevant heritage resource authorities (SAHRA and ECPHRA).

4.4 Terrestrial Biodiversity Impact Assessment

The site is in both a CBA1 and ESA1. Even though the site is mostly transformed and degraded, the sensitivity of critically endangered Algo Sandstone Fynbos cannot be ignored and therefore the very high sensitivity listed in the screening report is confirmed. A Terrestrial Biodiversity Specialist Assessment was commissioned. His recommendations will be included in the BAR/EMPr.

4.5 Aquatic Biodiversity Impact Assessment

The aquatic environment has been listed as low sensitivity in the study area by the screening report. A site visit confirmed that no water bodies will be impacted by the proposed expansion. It is therefore the opinion of the consultant that an Aquatic Specialist Impact Assessment is not required. A specialist was still approached to draft a compliance statement. His recommendations will be included in the BAR/EMPr.

4.6 Socio-economic Impact Assessment

It is the consultant's opinion that a Socio-Economic Impact Assessment is not necessary for the development, as the potential socio-economic impacts can be assessed within the BAR and adequately addressed by providing mitigation measures to promote socio-economic benefits from the development and minimise potential negative impacts.

4.7 Plant Species Assessment

Plant species has been listed as medium sensitive in the study area by the screening report. A botanist was approached and after the site visit, the site sensitivity was increased to high sensitive. This was because various plant species of conservation concern was observed on site. A Plant Species Specialist Assessment was commissioned. His recommendations will be included in the BAR/EMPr.

4.8 Animal Species Assessment

Animal species has been listed as high sensitive in the study area by the screening report. A faunal specialist was approached and after the site visit, the site sensitivity was confirmed as high sensitive. An Animal Species Specialist Assessment was commissioned. His recommendations will be included in the BAR/EMPr.

5. Conclusion

The proposed expansion of the Port Elizabeth Rifle and Pistol Club (PERPC) will be located on Farm 8 portion 5 in Greenbushes, Port Elizabeth. The expansion will involve the decommissioning and rehabilitation of the 1.61 ha pistol range located on Portion 6 of Farm 8 and the development of a new series of ranges on 6.78 hectares of land adjacent to the existing rifle range. This 6.78 ha of land will then merge with the existing 2.84 ha (rifle range), to make up a new total footprint of 9.64 ha, which will be the new footprint of the PERPC. BlueLeaf Environmental (Pty) has been appointed by PERPC undertake the required EA Application process in terms of the EIA Regulations, 2014 (as amended) promulgated under NEMA.

A Screening Tool Report was generated for the proposed project. According to the Screening Tool Report, eight specialist studies were identified and recommended to be undertaken as part of the environmental process. As set out above, only seven specialist studies recommended by the Screening Tool Report are deemed necessary to be undertaken as part of the environmental process. The outcome of these studies will be incorporated into the BAR and the reports attached as addendums to the BAR. All other general impacts identified, including socio-economic impacts, will be assessed as part of the BAR process and included into the EMPr.

Visual Impact Assessment

PROPOSED EXPANSION OF PORT ELIZABETH RIFLE AND PISTOL CLUB (PERPC) IN GREENBUSHES, PORT ELIZABETH, EASTERN CAPE

Prepared for:

PERPC

Date submitted: 14 October 2023

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1. Declaration of independence

I, Roy de Kock as duly authorised representative of Blue Leaf Environmental (Pty) Ltd, hereby confirm my independence (as well as that of BlueLeaf) as a specialist and declare that neither I nor BlueLeaf have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which BlueLeaf was appointed as environmental specialist in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for worked performed, specifically in connection with the Basic Environmental Assessment for the proposed The Heath Housing Estate Expansion. I further declare that I am confident in the results of the studies undertaken and conclusions drawn because of it – as is described in this report.

Full Name: Roy de Kock

Title / Position: Visual specialist
Qualification(s): BSc (Hons) Geology; MSc Botany; Candidate PhD Botany
Experience (years/ months): 17 years
Registration(s): SACNASP (400216/16)
Tel: +27 76 281 9660
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2. Expertise of specialist

Roy has over 17 years' experience in environmental consulting and specialist services in the EasternCape. Various projects throughout South Africa as well as Africa at larges has also been undertaken.Projects include baseline studies, impact assessments and compliance auditing for various large- scale projects including numerous wind farms, roads (National and Provincial), and infrastructure expansion projects. Roy has also conducted numerous specialist studies including but not limitedto Ecological and Botanical assessments, Biodiversity studies, Plant and Animal Search and Rescue,Fauna and Flora permits, Aquatic Assessments, Agricultural and Soil Assessments and Environmental and Venomous animals training workshops.

Roy holds a BSc Honours in Geology and an MSc in Botany from the Nelson Mandela University in Port Elizabeth. He is currently busy with his PhD (Doctorate degree) in Botany and Soil Science. He has over 14 years' experience in the environmental consulting focusing on Ecological and Agricultural Assessments, Geological and Geotechnical analysis, Environmental Management Plans,mining applications and various environmental impact studies.

Roy is a registered as a professional natural scientist (Pri.Sci.Nat.) with SACNASP (Registration nr: 400216/16).

This study complies with the requirements as listed in the Gazetted protocols for a general specialist assessment (GN. R 320 of 2020) and minimum report content requirements.

3. Introduction

Blue Leaf Environmental (Pty) Ltd has been appointed to conduct a Visual Impact Study for the proposed expansion of the Port Elizabeth Rifle and Pistol Club (PERPC) located on Erf 8 Portions 0 and 5, near Blommelaan road in Greenbushes, Port Elizabeth (Figure 3.1).

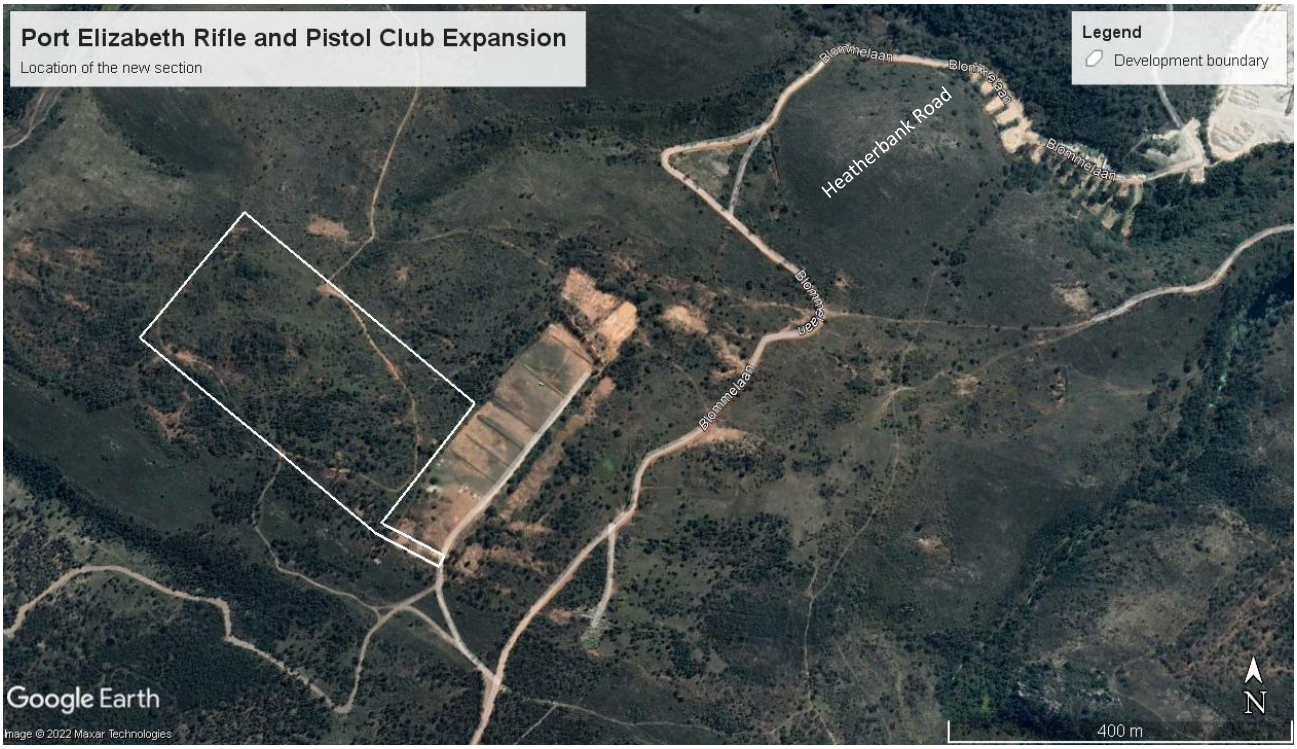

Figure 3.1: Proposed PERPC Expansion in Greenbushes, Port Elizabeth

3.1 Methodology

This report has been drafted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(a) and (h) and44 of NEMA (G.NR. 1150 of 2020) – Site Sensitivity Verification Requirements where a Specialist Assessment is Required but no Specific Assessment Protocol has been prescribed.

A site sensitivity verification has been conducted (see Chapter 6) to confirm/dispute the current useof the land and environmental sensitivity as identified by the Screening Tool. Motivation, with photographic evidence, was provided as part of the site sensitivity verification.

The visual assessment was done as per the DEA&DP Guideline for Involving Visual and Aesthetic Specialists in EIA processes (Oberholzer; 2005).

Current literature that was used to describe the site includes:

- The Eastern Cape Provincial Spatial Expansion Framework (PSDF) 2020
- The Nelson Mandela Bay Municipal Spatial Expansion Framework (SDF) 2021

Criteria evaluated include:

- Density of expansion.
- Aesthetics (design, scale, layout)
- Location

- Value in terms of 'sense of place'
- Character and nature of adjacent land use
- Character of the general area, and
- Cumulative environmental impacts.

4. Project description and Scenic Resources

The project will entail the clearance of 2 ha of transformed vegetation, mostly grassland for the establishment of up to 29 units of upmarket, free-standing homes in a secure estate. Plot sizes will range between 300-700 square meter in size (Figure 4.1). a new surfaced access road will be constructed, linking Heatherbank Road to the individual properties on site.

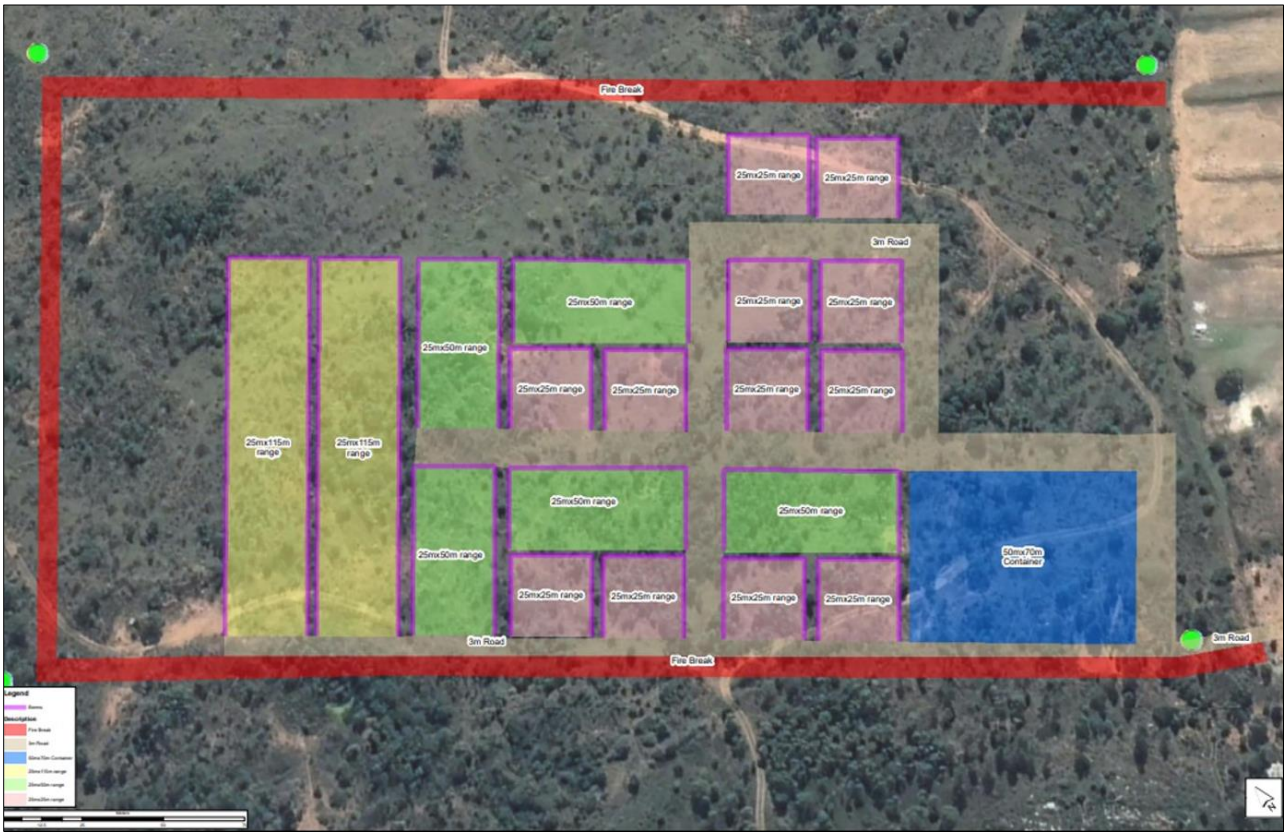

Figure 4.1: Layout of the proposed new PERPC expansion along Blommelaan Road in Greenbushes.

This section consists of a desktop analysis of the site based on available literature, plans andlegislation.

4.1 Scenic resources

Factors contributing to the scenic resource of the environment include:

- Rural/agriculture
- Natural/wilderness
- Urban expansion

Based on the above, scenic resources are rated as HIGH (Oberholzer; 2005)

5. Visual Assessment of The Site

The DEA&DP Guideline for involving visual & aesthetic specialists in EIA processes Document provides several criteria that relate specifically to Visual Impact Assessments namely:

- Visibility of the project;
- Visual exposure;
- Visual sensitivity of the area;
- Visual sensitivity of receptors;
- Visual Absorption Capacity; and
- Visual Intrusion.

The proposed project was assessed against these criteria to determine a sensitivity to the visual environment. Each criteria are discussed below:

5.1 Visibility of the project

The geographical area from which the project will theoretically be visible, or view catchment area, is dictated primarily by topography, and is often related to the catchment area of a river(s) and its watershed. Theoretically, the site could be seen from the flattened hilltop on which it sits. This is clearly seen in the Viewshed developed for this project (Figure 5.1).

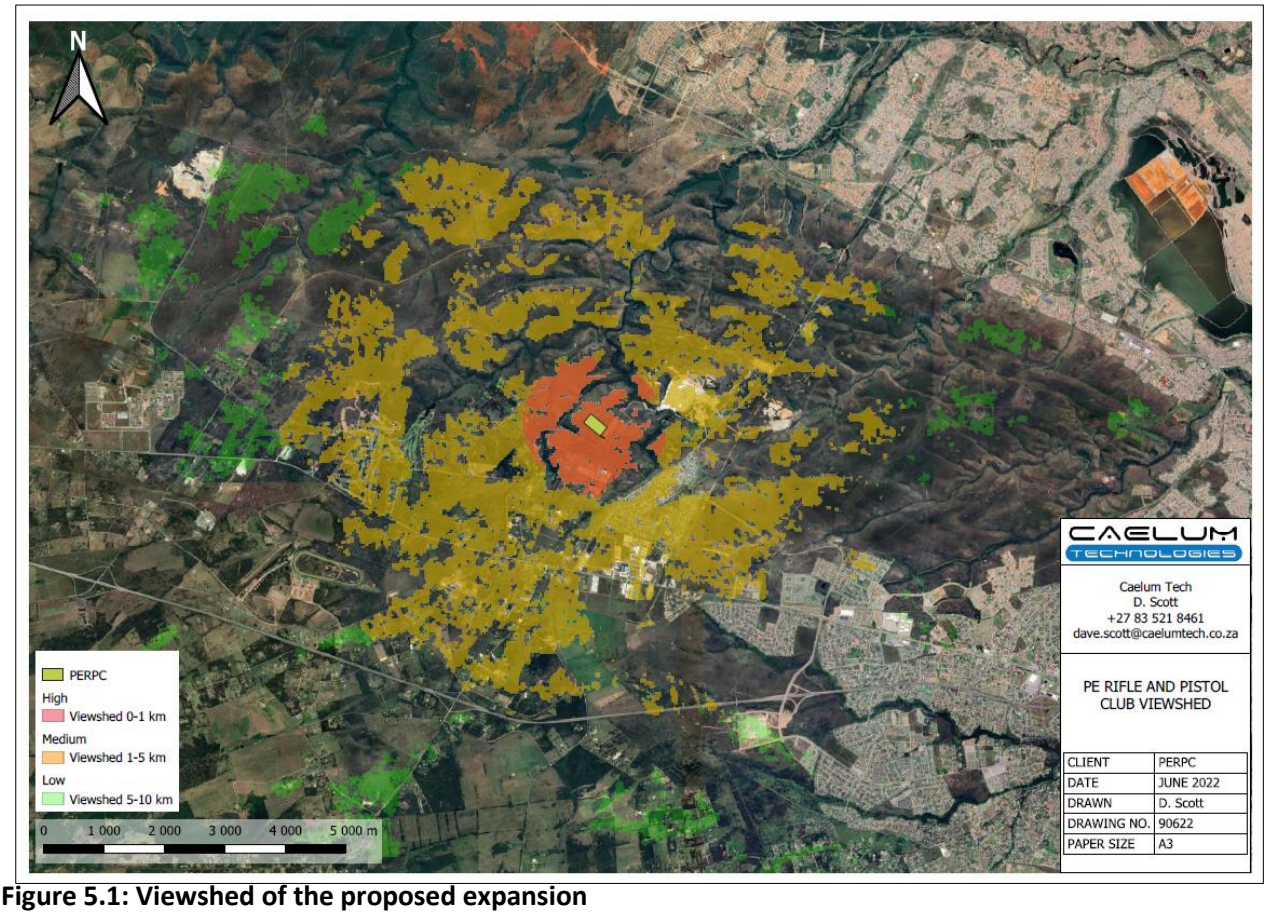

Figure 5.1: Viewshed of the proposed expansion

However, distance, expansion, vegetation, and topography will reduce the actual zone of visual influence that the site and project will have, to a much smaller area.

Zone of visual influence

The site is situated on the eastern boundary of the Chatty River Catchment with little visibility from the site. This is due to the higher elevation of the site and dense shrublike vegetation in these areas. The highest visibility will be within the first 5 km of the site. Here the proposed expansion can be seen partially provided there are no screens like trees and buildings. After that the visibility declines and cannot be seen.

5.2 Visual receptors

The level of visual impact considered acceptable as is dependent on the type of receptors within the surrounding environment:

- **High sensitivity** – includes residential areas, nature reserves and scenic routes or trails.
- **Moderate sensitivity** – includes sporting or recreational areas, or places of work.
- **Low sensitivity** – includes industrial, or degraded areas.

High sensitive receptors of the site include residentials areas to the south as well as the west. The remainder of the surrounding areas are considered as moderate sensitivity as they are considered as recreational areas and places of work. No industrial of degraded areas exist.

Visual receptors to the south include a residential area alongside Mission Road but vegetation screens the expansion	Expansion visibility in same location on Mission Road is visible without vegetation or topography
	

5.3 Visual exposure

High exposure – dominant or clearly noticeable
Moderate exposure – recognizable to the viewer
Low exposure – not particularly noticeable to the viewer

Within the Zone of Visual Influence - view corridors, viewpoints and receptors will experience “Visual Exposure” to the site and proposed expansion. Based on distance from the project to selected view corridors, viewpoints, or receptors, the ‘visual exposure’ or visual impact tends to diminish exponentially with distance.

5.4 View corridors

The only view corridors is Blommelaan Road which is also the gravel access route to the site and which will be rehabilitated after the expansion. This road is only used by clientele of the PERPC ends shortly after the proposed expansion site. The road passes the site along its south-eastern boundary.

Start of Blommelaan road which runs adjacent to the current PERPC layout and joins the rifle ranges and pistol ranges.

5.5 Visual sensitivity

The inherent visibility of the sites' landscape is usually determined by a combination of topography, landform, vegetation cover, settlement pattern and special features. This translates into visual sensitivity.

- **High visual sensitivity** – highly visible and potentially sensitive areas in the landscape,
- **Moderate visual sensitivity** – moderately visible areas in the landscape,
- **Low visual sensitivity** – minimally visible areas in the landscape

A desktop exercise was undertaken in whereby each of topography, landform, vegetation cover, settlement patterns and special features was mapped for the site and rated from low to high. These maps are overlaid, and the combined areas are assimilated to provide an overall sensitivity.

Vegetation

The South African National Biodiversity Institute (SANBI) vegetation map (called the VegMap; 2018)lists the proposed activity within mostly **Algoa Sandstone Fynbos** and a small north-western portion has **Bethelsdorp Bontveld**.

Sandstone fynbos is the most extensive vegetation group in the Fynbos biome (301 km^2) almost four times bigger than the next most prominent group and covering almost a third of the Fynbos biome. In the Eastern Cape it covers the coastal flats at Port Elizabeth (Gqeberha), located mostly some kilometers from the coast on flat to slightly undulating plains supporting grassy shrubland (mainly graminoid fynbos). Grasses become dominant in wet habitats and can form mosaics with surrounding vegetation types.

Bontveld is mainly in valleys cutting through the plateau along the southern edge of the Swartkops River basin. The vegetation type consists of patches of low thicket mosaicking with fynbos and sometime karooid elements. It is not comparable to other thicket types but has strong links to Baviaans Thicket types since it shares several tree and shrub species also found in that vegetation type.

Figure 5.1: SANBI VegMap of the study site

SANBI classifies sandstone fynbos vegetation unit as **Least Threatened** with 29% of the targeted 35% conserved in scattered protected areas and conservancies. Bontveld is not protected, but has a conservation target of 19% with 40% of the vegetation already transformed through activites such as mining, overgrazing, overharvesting, urban sprawl and roads with altered fire regime.

The NMBM BP (2014) classifies vegetation on site as Bethelsdorp Bontveld and Rowallan Park Grassy Fynbos and classifies it as Vulnerable and Endangered respectively.

A site visit confirmed that very little natural vegetation occurred on site. There are large trees alien invasive trees and some indigenous trees lining the road causing the site to be screened from the surrounding environment by vegetation.

Topography

The landscape within the proposed development site is flat with a very low undulating flat landscape. The study area is located at 180m above sea-level.

Land cover

Current land use has been determined and shows that almost the entire study site is covered by transformed natural vegetation dominated by wattle and gum woodlots. These areas have been transformed because of historical surface mining (probably for sand and gravel). Intact endemic vegetation can be found on a small portion (1.65 ha) within the proposed expansion site.

Screening report

The screening report does not classify the sensitivity of the visual environment. It does however list the study as one of the required specialist studies that must be conducted as part of the BAR process for the

proposed project. The aim of this report is to determine sensitivity allocation through a detailed desktop analysis and site verification as per GN R 320 of 2020 (Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on the General Environment).

Visual sensitivity

The visual sensitivity of the site is **categorized as Low sensitivity**. This is because the site is located in a flat, landscape in a mostly undeveloped landscape surrounded by dense and tall vegetation screening all infrastructure for the surrounding landscapes.

5.6 Visual Absorption Capacity

Visual Absorption Capacity (VAC) is the potential of the landscape to conceal the proposed project. VAC can be described as:

High VAC – e.g. effective screening by topography and vegetation.

Moderate VAC - e.g. partial screening by topography and vegetation.

Low VAC - e.g. little screening by topography or vegetation.

Visual Absorption Capacity (VAC) is the capacity for the landscape to conceal the proposed expansion. The VAC of a landscape depends on its topography and on the type of vegetation that occurs in the landscape. The size and type of the expansion also plays a role.

The potential of the landscape of the sites and the surrounding areas to conceal the expansion, are considered as high. Being situated on a flat, elongated plain dominated by dense and large trees results in the site not being visually exposed to the immediate surrounding area and therefore has a high VAC.

5.7 Visual Intrusion

Visual Intrusion is defined as the level of compatibility or congruence of the project with the particular qualities of the area, or its *'sense of place*'. This is related to the idea of context and maintaining the integrity of the landscape or townscape.

High visual intrusion – results in a noticeable change or is discordant with the surroundings.

Moderate visual intrusion – partially fits into the surroundings, but clearly noticeable.

Low visual intrusion – minimal change or blends in well with the surroundings.

The proposed expansion will take place in an area where it is completely screened by natural vegetation (mostly trees) and will do little in changing the visual quality in the area.

The visual intrusion will be low; the proposed expansion will fit into its surroundings but will not be noticeable.

6. Potential Impacts

6.1 Impact Assessment Methodology

The assessment of visual impacts is based on a synthesis of criteria including; nature of impact, extent, duration of the impact, intensity, probability of occurrence, reversibility, Irreplaceable loss of resources, cumulative effect and level of significance.

6.2 Nature of impacts

The following impacts have been identified:

1. Pre-construction phase:

1.1: Removal of mostly alien woody vegetation will be required for earthworks. Dense, tall trees exist on site but thus is extensive and screening vegetation will remain even after clearing and therefore vegetation removal will have no impact on the visual resource.

2. Construction phase:

2.1: During construction, earthworks would create soil stockpiles and would result in visual blocking of the landscape.

3. Operational Phase:

3.1: The site is currently undeveloped and covered in dense alien vegetation. Expansion would result in a change in visual character from a 'woodland' unbuilt landscape to a cleared landscape.

3.2: The proposed expansion will require lighting which will have a visual impact at night. This will be visible to the surrounding areas and sensitive receptors in these areas.

6.3 Summary of impacts

The following table summarizes each visual impact identified and its respective ratings for each criteria:

Criteria	Impacts identified		
	Soil stockpiles	Change in character	Night lighting
Extent of impact	Site only	Local area	Local area
Duration of impact	Short term (less than 12 months)	Permanent	Permanent
Intensity	Low	Moderate	Moderate
Probability	Possible	Definite	Probable
Reversibility	Reversible	Reversible	Reversible
Irreplaceable loss of resource	Marginal	Significant	Marginal
Cumulative effect	Low	High	Moderate
Significance	Low	High	Moderate

7. Mitigations

The following mitigation measures are proposed:

- Providing expansion and architectural guidelines for all units to “blend in” to the surrounding environment.
- Keep dense woody alien trees to act as a visual screen.

8. References

DRIVER, A. et al. 2011. National Biodiversity Assessment 2011: an assessment of South Africa's biodiversity and ecosystems. Synthesis Report. SANBI and DEAT, Pretoria.

MUCINA, L. & RUTHERFORD, M.C. 2012. The vegetation of South Africa, Lesotho and Swaziland. SANBI, Pretoria.

Oberholzer, B. 2005. Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 F. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Expansion Planning, Cape Town.

A LETTER OF RECOMMENDATION (WITH CONDITIONS) FOR THE EXEMPTION OF A FULL PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE PROPOSED EXPANSION OF THE EXISTING PORT ELIZABETH RIFLE AND PISTOL CLUB ON PORTIONS 0 AND 5 OF ERF NO. 8 IN GREENBUSHES, GQEBERHA (PORT ELIZABETH), NELSON MANDELA BAY MUNICIPALITY, EASTERN CAPE PROVINCE

Prepared for: BlueLeaf Environmental Consulting (Pty) Ltd.
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Compiled by: Mr. Kobus Reichert

On behalf of: Eastern Cape Heritage Consultants cc
Reg. no: 2006/088345/23
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Date: July 2023

PROJECT INFORMATION

Eastern Cape Heritage Consultants cc has been appointed by BlueLeaf Environmental Consulting (Pty) Ltd to conduct a Phase 1 Archaeological Impact Assessment (AIA) for the proposed expansion of the existing Port Elizabeth Rifle and Pistol Club on Portions 0 and 5 of Erf No. 8 in Greenbushes, Gqeberha (Port Elizabeth), Nelson Mandela Bay Municipality, Eastern Cape Province.

The proposed expansion of the rifle and pistol range will be located on 6.8 ha of undeveloped land adjacent to the existing range. The proposed expansion will consist of the following:

- 4 x (25m x 50m) ranges.
- 2 x (25m x 115m) ranges.
- 12 x (25m x 25m) ranges.
- 1 x (50m x 70m) space for offices and storage containers
- Approximately 900m of new road, 3m wide
- A firebreak surrounding the entire expansion.

Applicant

Port Elizabeth Rifle and Pistol Club (PERPC)

Consultant

BlueLeaf Environmental Consulting (Pty) Ltd.
38 Tulip Avenue
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6001
Cell: 076 281 9660
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Email: roy@blueleafenviro.co.za

Purpose of the study

The purpose of the study was to conduct a Phase 1 Archaeological Impact Assessment (AIA) for the proposed project and the associated activities, to describe and evaluate:

- the importance of possible archaeological sites, features and materials,
- the potential impact of the development on these resources and,
- to propose recommendations to minimize possible damage to these resources.

Site and Location

The proposed development area is located within the 1:50 000 topographic reference map 3325CD & 3425BA Uitenhage (Map 1). Portions 0 and 5 of Erf No. 8 are located approximately 15 kilometres north - west (NW) of the Gqeberha (Port Elizabeth) CBD. An existing gravel road connects the proposed site to Blomme Lane in the suburb of Greenbushes (Map 2). The proposed development will take place on a relatively flat area covered by dense grass and trees but a recent veld fire caused severe damage to the vegetation on the properties. (Figure 1). It also appears that the site has been disturbed in the past by possible mining activities and heaps of soil mixed with large rocks and gravel can be observed at several locations. General GPS reading: 33.54.371S, 25. 25.854E.

Relevant Archaeological Impact Assessments

Binneman, J. 2014. A phase 1 archaeological impact assessment for the proposed integrated residential development and associated infrastructure in the Hunters Retreat area, Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province. Prepared for CEN Integrated Environmental Management Unit. Port Elizabeth. Eastern Cape Heritage Consultants cc. Jeffreys Bay.

Binneman, J. 2011. A phase 1 archaeological heritage impact assessment for the proposed residential development on the remainder of Erf 982, Parsonsvlei , Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province. Prepared for CEN Integrated Environmental Management Unit. Port Elizabeth. Eastern Cape Heritage Consultants cc. Jeffreys Bay.

Binneman, J. 2010. A letter of recommendation (with conditions) for the exemption of a full phase 1 archaeological heritage impact assessment for the proposed hard rock (quartzite) quarry on Erf 1, Parsonsvlei, Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province. Prepared for Stellenryck Environmental Solutions. Port Elizabeth. Eastern Cape Heritage Consultants cc. Jeffreys Bay.

Binneman, J. and Reichert, K. 2021. A letter of recommendation (with conditions) for the exemption of a full phase 1 archaeological heritage impact assessment for the proposed development of a Solar Photovoltaic (PV) facility on a portion of Erf 1, Parsonsvlei, Gqeberha within the Nelson Mandela Bay Municipality, Eastern Cape. Prepared for: JG Afrika. Greenacres. Eastern Cape Heritage Consultants cc. Jeffreys Bay.

Reichert, K. 2022. A letter of recommendation (with conditions) for the exemption of a full phase 1 archaeological heritage impact assessment for the proposed development of Erven 984 and 1134, Parsonsvlei, Nelson Mandela Bay Municipality, Eastern Cape Province. Prepared for Engineering Advice & Services (Pty) Ltd. Humewood. Eastern Cape Heritage Consultants cc. Jeffreys Bay.

Van Ryneveld, K. 2007. Phase 1 archaeological impact assessment. The Hopewell Conservation Project, Greenbushes, Port Elizabeth, South Africa. Prepared for SRK Consulting. Port Elizabeth. Archaeomaps Archaeological Consultancy. Danhof.

ARCHAEOLOGICAL INVESTIGATION

Methodology and results

Google aerial images as well as previous heritage reports related to the study area were studied prior to the investigation. The investigation was conducted on foot by an archaeologist. GPS readings were taken with a Garmin and all important features were digitally recorded. The archaeological visibility was poor due to the dense grass and other vegetation but the visibility was better in the gravel roads and other open areas as a result of the recent veld fire. No archaeological sites/materials were observed within the study area. In general, the area for the proposed development appears to be of **low archaeological sensitivity** and it is unlikely that any archaeological remains of any significance will be found *in situ* or exposed during the development.

Figure 1. General views of the proposed development area on Portions 0 and 5 of Erf No. 8 in Greenbushes, Gqeberha (Port Elizabeth), Nelson Mandela Bay Municipality, Eastern Cape Province.

DISCUSSION AND CONDITIONS

No archaeological sites/materials were observed during the investigation of the proposed study area. Although it is unlikely that archaeological remains will be found *in situ*, there is always a possibility that human remains and/or other archaeological and historical material may be uncovered during the development.

The main impact on possible archaeological sites/remains will be the physical disturbance of the material and its context. Should such material be exposed then work must cease in the immediate area and it must be reported to the archaeologist at the Albany Museum in Makhanda (Grahamstown) (Tel: 046 622 2312) or to the Eastern Cape Provincial Heritage Resources Authority (Tel.: 043 745 0888), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to remove/collect such material (See Appendix B for a list of possible archaeological sites that maybe found in the area). The applicant must finance the costs should additional investigations be required.

LETTER OF RECOMMENDATION

It is recommended that the proposed expansion of the existing Port Elizabeth Rifle and Pistol Club on Portions 0 and 5 of Erf No. 8 in Greenbushes, Gqeberha (Port Elizabeth), Nelson Mandela Bay Municipality, Eastern Cape Province, be exempted from a full Phase 1 Archaeological Heritage Impact Assessment. The proposed development area appears to be of **low archaeological sensitivity**, and it is therefore unlikely that any significant archaeological remains will be found on the property. The proposed development may therefore proceed as planned.

Note: This letter of recommendation only exempts the proposed development from a full Phase 1 Archaeological Heritage Impact Assessment, but not for other heritage impact assessments. It must also be clear that this letter will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

Section 35 of the National Heritage Resources Act, No. 25 of 1999 (see Appendix A) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus, any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

GENERAL REMARKS AND CONDITIONS

It must be emphasized that this letter of recommendation for the exemption of a full Phase 1 archaeological heritage impact assessment is based on the visibility of archaeological sites/material and may not therefore, reflect the true state of affairs. Sites and material may be covered by soil and vegetation and will only be located once this has been removed. In the unlikely event of such finds being uncovered, (during any phase of the development), it must be reported to the archaeologist at the Albany Museum in Makhanda (Grahamstown) (Tel: 046 622 2312) or to the Eastern Cape Provincial Heritage Resources Authority (Tel.: 043 745 0888) immediately. The developer must finance the costs should additional studies be required as outlined above. The consultant is responsible to forward this report to the relevant Heritage Authority for assessment, unless alternative arrangements have been made with the specialist to submit the report.

APPENDIX A: brief legislative requirements

Parts of sections 34, 35(4), 36(3) and 38(1) of the National Heritage Resources Act, No. 25 of 1999 apply:

Structures

34(1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

Archaeology, palaeontology and meteorites

35 (4) No person may, without a permit issued by the responsible heritage resources authority—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Burial grounds and graves

36. (3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Heritage resources management

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of the site –
(i) exceeding 5000m^2 in extent, or
(ii) involving three or more erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a

provincial resources authority;

(d) the re-zoning of a site exceeding 10 000m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

APPENDIX B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

Fossil bone

Fossil bones or any other concentrations of bones, whether fossilized or not, should be reported.

Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

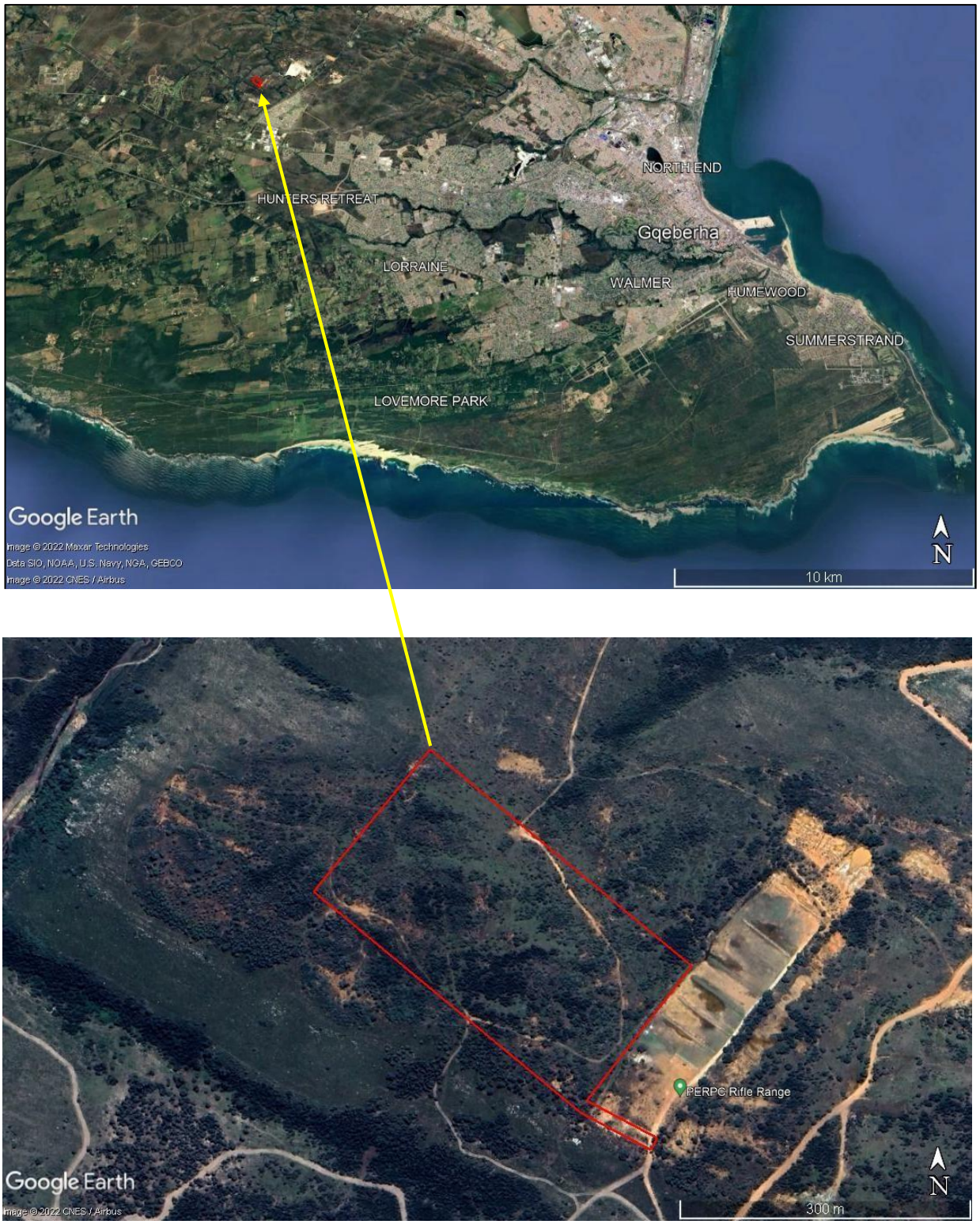
Stone features and platforms

These occur in different forms and sizes, but easily identifiable. The most common are an accumulation of roughly circular fire cracked stones tightly spaced and filled in with charcoal and marine shell. They are usually 1-2 metres in diameter and may represent cooking platforms for shell fish. Others may resemble circular single row cobble stone markers. These occur in different sizes and may be the remains of wind breaks or cooking shelters.

Historical artefacts or features

These are easy to identify and include foundations of buildings or other construction features and items from domestic and military activities.

Map 1. 1:50 000 Topographic maps indicating the approximate location of the proposed development area on Portions 0 and 5 of Erf No. 8 in Greenbushes, Gqeberha (Port Elizabeth), Nelson Mandela Bay Municipality, Eastern Cape Province (indicated with the red arrow).



Map 2. Aerial views of the location of the proposed development area on Portions 0 and 5 of Erf No. 8 in Greenbushes, Gqeberha (Port Elizabeth), Nelson Mandela Bay Municipality, Eastern Cape Province (indicated with the yellow arrow). The property boundary is outlined in red.

Map 3. Layout for the proposed development on Portions 0 and 5 of Erf No. 8 in Greenbushes, Gqeberha (Port Elizabeth), Nelson Mandela Bay Municipality, Eastern Cape Province. (Map courtesy of BlueLeaf Environmental Consulting).

Terrestrial Biodiversity, Plant and Animal Species Assessment

Expansion of the Port Elizabeth Pistol and Rifle Club (PERPC), Port Elizabeth, Eastern Cape Province

Prepared for:

Mr Franco Cilliers
Port Elizabeth Rifle and Pistol Club (PERPC)
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Date submitted: 19 January 2024

Mr Roy de Kock M. Sc (*Pri.Nat.Sc.*)
Ecologist and Biodiversity specialist
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6045

East London:
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East London
5213

DECLARATION OF INDEPENDENCE

I, Roy de Kock as duly authorised representative of BlueLeaf Environmental (Pty) Ltd, hereby confirm my independence (as well as that of BlueLeaf) as a specialist and declare that neither I nor BlueLeaf have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which BlueLeaf Environmental was appointed as environmental assessment practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for worked performed, specifically in connection with the Specialist Assessment for the proposed PERPC Expansion development in Port Elizabeth. I further declare that I am confident in the results of the studies undertaken and conclusions drawn because of it – as is described in this report.

_____

Full Name: Roy de Kock
Title / Position: Ecologist
Qualification(s): BSc (Hons) Geology; MSc Botany; Candidate PhD Botany
Experience (years/ months): 17 years
Registration(s): SACNASP (400216/16)

EXPERTISE

Roy has over 17 years' experience in environmental consulting and specialist services in South Africa. Various projects throughout Africa have also been undertaken. Projects include baseline studies, impact assessments and compliance auditing for various large-scale projects including numerous wind farms, roads (National and Provincial), and infrastructure development projects. Blue Leaf also offers a wide range of in-house specialities listed in the DFFE Screening Tool including but not limited to Plant Species, Animal Species, Aquatic Biodiversity, Terrestrial Biodiversity, Agricultural and Agri-Ecosystem and Landscape/Visual Studies.

Roy holds a BSc Honours in Geology and an MSc in Botany from the Nelson Mandela University in Port Elizabeth. He is currently busy with his PhD (Doctorate degree) in Botany and Soil Science.

Table of Contents

1. Introduction

BlueLeaf Environmental (Pty) Ltd has been appointed by PERPC to provide terrestrial biodiversity, plant and animal species input into the proposed expansion of the existing rifle range into several new ranges and infrastructure within Port Elizabeth, Eastern Cape Province. The existing site is located on Farm 8 portion 5 (5/8) and Farm 8 portion 6 (6/8), with the new PERPC expansion occurring only on Farm portion 5 in Greenbushes located in Port Elizabeth (Figure 1.1).

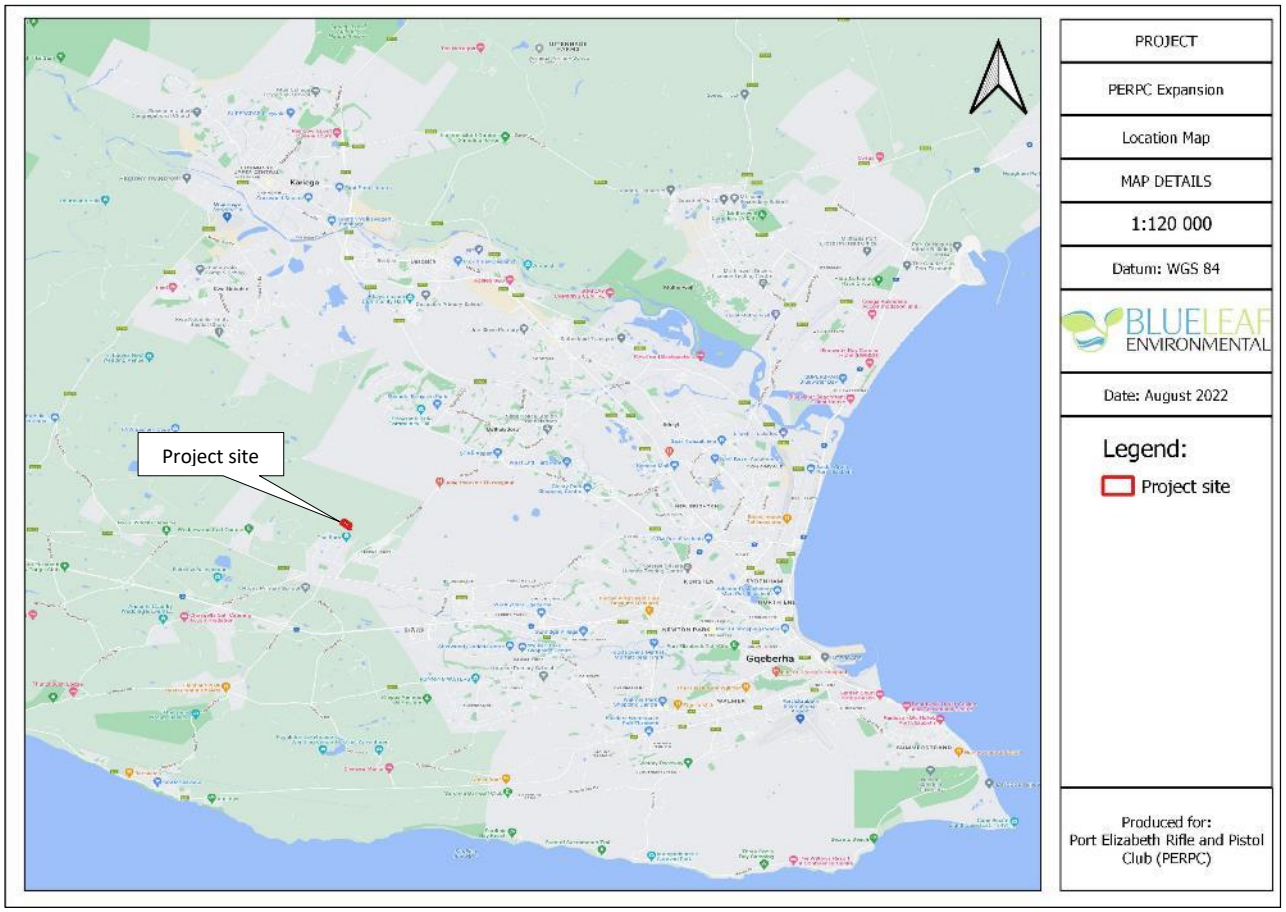

Figure 1.1 Location of the proposed PERPC Expansion in Greenbushes, Gqeberha in the Eastern Cape Province

The aerial image of the proposed site (Figure 1.2 below) shows the existing rifle range of Farm 8, Portion 5 and existing pistol range on Farm 8, Portion 6 adjacent to the proposed expansion which will be located on Portion 5 of Farm 8. (Figure 1.2).

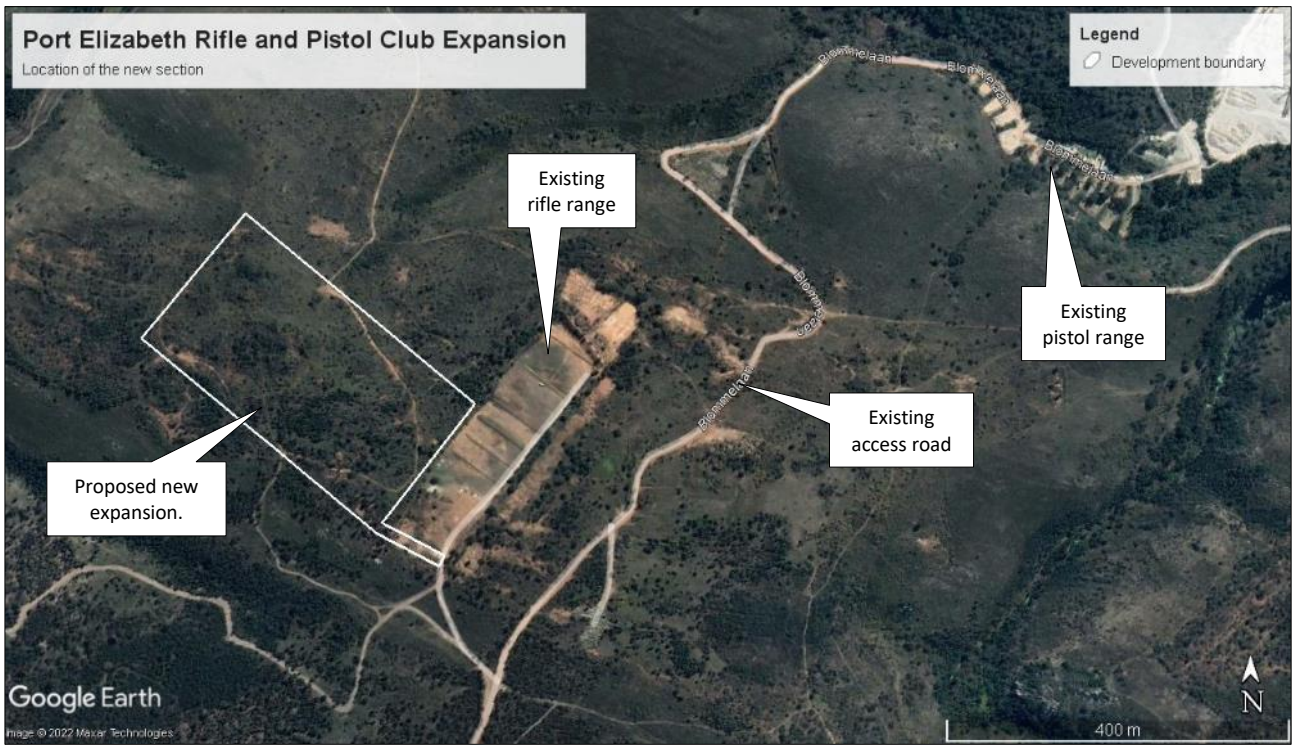

Figure 1.2: Aerial view of the proposed project site

1.1. Project description

The proposed expansion of the Port Elizabeth Rifle and Pistol Club (PERPC) will be located on farm 8 portion 5 in Greenbushes, Port Elizabeth. The PERPC will be expanded onto the 6.8 hectares land adjacent to the existing rifle range, and will include the following infrastructure (Figure 1.3):

- 4 x (25m x 50m) ranges.
- 2 x (25m x 115m) ranges.
- 12 x (25m x 25m) ranges.
- 1 x (50m x 70m) space for offices and storage containers
- Approx. 900m of new road, 3m wide
- A firebreak surrounding the entire expansion.

The existing pistol range will be moved onto the new expansion and will not be maintained after development moves into operational phase. The old pistol range will be deconstructed and rehabilitated.

Figure 1.3: Proposed layout of the new expansion section

Table 1.1: Comparing land cover size before and after expansion for farm 8 portion 5 and 6

Land cover sizes before development(ha)			TOTAL (ha) Combined properties
Description	Farm 5/8 (rifle range)	Farm 6/8 (pistol range)	
Farm size total	119	341	460
Existing footprint	2.84	1.21	4.05
Additional footprint	6.8	-1.21	5.64
New total footprint	9.64	0	9.64

The total combined property size of farm 8 portions 5 and 6 is 460ha which is mostly natural vegetation. The current existing PERPC footprint of portions 5 and 6 combined is 4.05ha. The new expansion area of PERPC which will take place on farm 8 portion 5, is 6.8ha. This 6.8ha will be then merge with the existing 2.84ha (rifle range) to make up a new total footprint of 9.64ha, which will be the new footprint of the PERPC expansion development. The existing portion 6 (1.21ha) will be deconstructed and rehabilitated (old pistol range).

1.2. Legislative context

The following legislation is directly relevant when assessing the terrestrial environment relating to the proposed new Gonubie fuel station in the Eastern Cape Province:

National Environmental Management Act (NEMA) (107 of 1998; as amended), and the Specialist Assessment Protocols (GNR 320 of 2020):

The contents of this specialist report comply with the legislated requirements as described in the following specialist assessment protocols as listed in the projects' Screening Report:

- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity.
- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Animal Species.
- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Plant Species.

The Species Environmental Assessment Guidelines published in 2022 were used for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols in this report.

National Environmental Management Act (NEMA) (107 of 1998; as amended), and the EIA regulations (as amended):

Although the Specialist Assessment Protocols (as listed above) supersedes this legislative requirement, the contents of this specialist report still comply with the legislated requirements as described in Appendix 6 of the National Environmental Management Act (No 107 of 1998; NEMA) Regulations of 2014 and updated in 2017 (GN R. 326 of 2017).

1. *Other national legislation*

Other national legislation relative to this project include:

Title of legislation or guideline	Administering authority	Applicability to the project
National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations 2014 as amended (Act No. 107 of 1998)	DEDEAT	The activity triggers activities listed in NEMA EIA Regulations GN R. 327 and GN R. 324.
National Water Act, 1998 (Act No. 36 of 1998)	Department of Water & Sanitation (DWS)	Infrastructure may impact on existing surface water systems. This impact is only mentioned in this report (if relevant) and NOT assessed.
National Environment Management: Biodiversity Act (NEMBA) (No. 10 of 2004)	DEDEAT	The proposed development must: - Conserve endangered ecosystems and protect and promote biodiversity. - Assess the impacts of the proposed development on endangered ecosystems. - No protected species may be removed or damaged without a permit; and

Title of legislation or guideline	Administering authority	Applicability to the project
		- The proposed site must be cleared of alien vegetation using appropriate means.
National Forest Act (84 of 1998)	Provincial Department of Forestry	Requires that a permit be obtained should any forests or protected trees be removed during the construction phase of the project.

Relevant Provincial and Metropolitan legislation include:

Title of legislation or guideline	Administering authority	Applicability to the project
Nelson Mandela Bay Municipal Biodiversity Sector Plan (NMB BSP, 2014)	DEDEAT	Listing of critical biodiversity areas and ecological support areas within the study site. The discussion in this report is based on vegetation type, connectivity, habitat condition and presence of Red List Threatened species.
Nature and Environmental Conservation Ordinance (No.19 of 1974)	DEDEAT	Listing of protected animal species. Permits are required for removal and relocating any of these listed species in the EC.

1.3. Alternative

No site alternatives or layout are proposed.

1.4. Public consultation

No consultation requirements were identified during the drafting of this specialist report. The findings of this report can be presented to stakeholders and I&APs as part of the Basic Assessment Public Participation Process (PPP).

No comments were received to date on this report.

1.5. Objectives

The objectives of the project are listed below. These objectives are based on the requirements of each specialist protocol as listed in the DFFE Screening Report:

- Describe both the existing area as well as the area prior to construction in terms of its current ecological characteristics and the general sensitivity of these components to change.
- Confirm if there are any outright fatal flaws to the establishment of the proposal at its current location from a biodiversity perspective.
- Map all existing areas to be directly affected by the proposals in terms of its current and previous biodiversity sensitivity (constraints).
- Map all 'No-Go' areas.

- Describe the likely scope, scale, and significance of impacts (positive and negative) on biodiversity components of the area associated with the construction of the proposals.
- Make recommendations on the scope of any mitigation measures that may be applied during construction to avoid/reduce the significance of the identified construction-related impacts.
- Describe the likely scope, scale, and significance of impacts (positive or negative) on the biodiversity components associated with the operation or use of the proposals.
- Make recommendations on the scope of any mitigation measures that may be applied to avoid/reduce the significance of the operations-related impacts. These mitigation measures could also be design recommendations as well as operational controls, monitoring programmes, management procedures and the like.
- It will be particularly important to identify any rehabilitation measures that can be reasonably applied on the completion of the construction works.
- Broadly comment on the cumulative ecological impacts (positive or negative) associated with the construction and/or operation of the proposals.

It should be noted that only datasets and base data relevant to the study area and affected environmental features are discussed below.

1.6. Assumptions and limitations

- The report is based on currently available information and, as a result, limited by the information provided by the Client.
- The report is limited by seasonality as the presented data will be based on a single site survey of species conducted within a single season (mid-summer) of a single year (2023).

1.7. Project Area of Influence

The Project Area of Influence (PAOI) is defined according to important ecosystem processes and functions that may be plausibly affected by the proposed development and its associated activities. Figure 1.3 below illustrates the PAOI for the proposed new development.

Primary PAOI: Area to be cleared of vegetation which is 4.60ha. This is the area directly impacted by the proposed development.

Secondary PAOI: The secondary PAOI includes farm 8 portion 5 and portions 6 all portions of Farm 8/55 and Farm 125/49 outside the Primary PAOI. This is a 199-ha land parcel and will not be impacted by the proposed development. The Secondary PAOI will therefore not be assessed in this report.

Tertiary PAOI: There are no tertiary PAOI as the Terrestrial Biodiversity, Plant and Animal Species areas outside the Primary PAOI will not be affected.

Only the Primary and Secondary PAOI's will be assessed in this report.

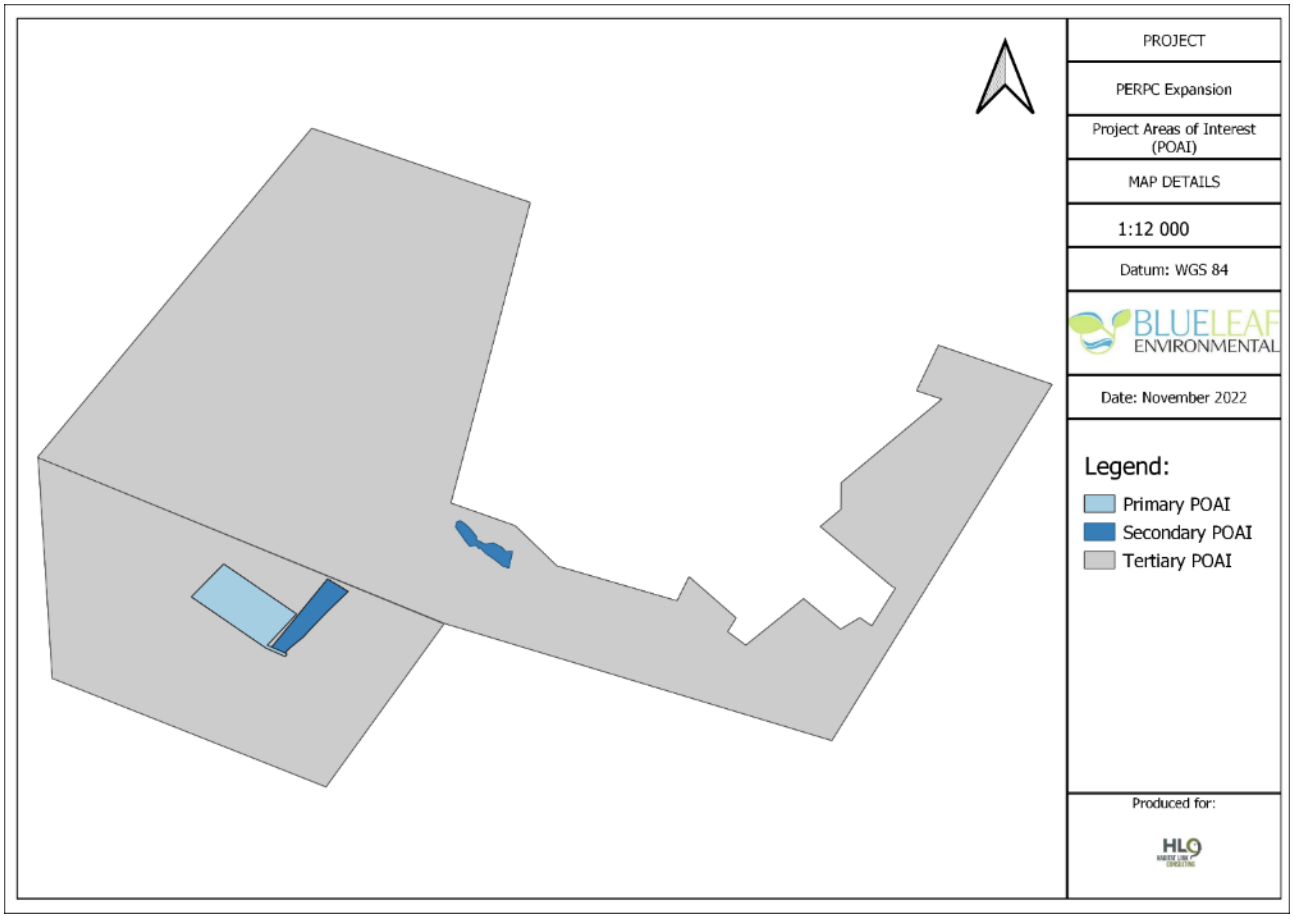

Figure 1.3: Site map showing the Project Area of Interest (PAOI).

2. Approach and Methodology

The aim of this assessment is to identify areas of ecological importance and to evaluate these in terms of their conservation importance. To do so, the ecological sensitivity of the area is assessed as well as an identification of potential plant Species of Conservation Concern (SCC) that may occur in habitats present in the area. The condition and sensitivity of the vegetation as well as the presence of plant SCC will determine areas with high biodiversity.

The study site was assessed using a two-phased approach. Firstly, a desktop assessment of the site was conducted in terms of current biodiversity programmes and plans.

Further to the above, a site visit was conducted on the 5th of October 2022. The site visit served to inform potential impacts of the proposed project and how significantly it would impact on the surrounding terrestrial environment.

2.1. Plant species classification

To identify plant species that potentially occur naturally in the project area firstly required an understanding of the broad botanical habitats in the area. These habitats were identified according to various ecological characteristics, including vegetation type (SANBI VegMap; 2018), the degree of transformation of the vegetation, geology and soil type, and topography.

The potential occurrence of plants that is considered as species of conservation concern within the project area was identified through a detailed assessment of the site. Published literature and online resources that are continuously updated with new species observations were consulted to compile lists of plant, including:

- The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford; 2006)
- iNaturalist.
- Plants of South Africa (new POSA).
- SANBI Red List of South African Plants.
- Screening Tool, and
- Global Biodiversity Information Facility (GBIF).

Plant Species of Conservation Concern (SCC) were limited to endemic flora, and were defined to include:

- Red Data species identified using the IUCN Red List of Threatened Species.
- Red Data species identified using the Red List of South African Species. This includes all species that are assessed according to the IUCN Red List Criteria as Critically Endangered, Endangered, Vulnerable, Near Threatened, Rare, Extremely Rare, or Data Deficient.
- Plants listed in terms of Section 56 of the National Environmental Management: Biodiversity Act, 2004 (NEMBA) (Act 10 of 2004, as amended), and regulated by the Threatened or Protected Species (TOPS) Regulations, 2007. This includes species that are Critically Endangered, Endangered, Vulnerable, and Protected.

In addition to plant SCC, the following plants were also identified:

- Plants protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Plants listed in terms of the Nature and Environmental Conservation Ordinance (NECO) (No 19 of 1974).

The inclusion of plant species on CITES Appendices (I–III) and NECO Schedules (1–2) are not necessarily equivalent to the species' conservation status. Many common species are pragmatically included on these lists even though their conservation status may not be of demonstrated concern. A permit is however required for the removal of species that occur on CITES and NECO lists.

Several sensitive plant species, identified by the Department of Forestry, Fisheries, and the Environment's (DFFE) National Web-based Environmental Screening Tool as important, required specific consideration. These species include:

Sensitivity	Feature(s)
Medium	Sensitive species 1252
Medium	*Erepsia aristate*
Medium	*Argyrolobium crassifolium*
Medium	*Aspalathus recurvispina*
Medium	Sensitive species 991
Medium	*Lotononis acuminata*
Medium	Sensitive species 1268
Medium	*Selago rotundifolia*
Medium	*Erica chloroloma*
Medium	*Erica zeyheriana*
Medium	*Gymnosporia elliptica*
Medium	Sensitive species 588
Medium	*Apodolirion macowanii*
Medium	Sensitive species 657
Medium	Sensitive species 670
Medium	Sensitive species 570
Medium	*Rapanea gilliana*
Medium	*Marsilea schelpeana*
Medium	*Holothrix longicornu*
Medium	*Agathosma gonaquensis*
Medium	*Agathosma stenopetala*
Medium	*Justicia orchioides subsp. orchioides*
Medium	*Corpuscularia lehmannii*
Medium	*Ellisochloa papposa*
Medium	*Caputia scapose var. addoensis*
Medium	*Aristea nana*
Medium	Sensitive species 448
Medium	*Bobartia macrocarpa*

Sensitivity	Feature(s)
Medium	*Erica glumiflora*
Medium	Sensitive species 654
Medium	*Disperis woodii*

The following criteria were evaluated during the site visit to assess habitat suitability for these species:

1. Vegetation type and cover.
2. Geology and soil type.
3. Rock cover, and
4. Topography.

Sensitive habitats were identified as those habitats that are vulnerable to disturbances and supporting SCC in the project area.

On the 5th of October 2023, a visit to the project area was conducted to:

1. Assess the micro-positioning for infrastructure.
2. Confirm the occurrence of sensitive vegetation habitats.
3. Note any occurrence of plant SCC and other indicator species occurrences, and
4. Assess the extent of current threats (not project related) on vegetation and plant SCC (e.g., evidence for direct exploitation, habitat transformation, etc.).

2.2. Vegetation mapping

Mucina and Rutherford (2010) developed the National Vegetation Map (VegMap). The latest update of the VegMap took place in 2018. This map describes each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa. The VegMap was used to identify vegetation types on site.

2.3. Animal species classification

Records of animal SCC (amphibians, reptiles, mammals, birds, and butterflies) that potentially occur naturally in the vicinity of the project area were extracted from published and online sources that are continuously updated with new species observations. The listed species were scrutinised, using published accounts of their ecology and habitat requirements, in terms of their likely use of habitats in the project area of influence. Sources consulted to compile species lists included:

Group	Source
Amphibians	➢ Frog Atlas of Southern Africa (http://vmus.adu.org.za; FrogMap) - Du Preez & Carruthers (2017)
Reptiles	➢ Reptile Atlas of Southern Africa ((http://vmus.adu.org.za; ReptileMap) - Alexander & Marais (2007)
Mammals	➢ Mammal Atlas of Southern Africa ((http://vmus.adu.org.za; MammalMap) - Skinner & Chimimba (2005)
Birds	➢ Southern African Bird Atlas Project 2 (SABAP2) - Harrison et al. 1997

Group	Source
Butterflies	➢ Atlas of African Lepidoptera ((http://vmus.adu.org.za; LepiMap) - Woodhall (2020)
Animal Species of Conservation Concern	➢ Fauna with their distribution ranges limited to the Eastern Cape Province. ➢ Red Data species identified using the IUCN Red List of Threatened Species (http://iucnredlist.org). ➢ Red Data species identified using the Red List of South African Species (http://speciesstatus.sanbi.org). Includes all species that are assessed according to the IUCN Red List Criteria as Critically Endangered, Endangered, Vulnerable, Near Threatened, Rare, Extremely Rare, or Data Deficient. Listings were corroborated with data from the South African amphibian (Measey 2011), reptile (Bates et al. 2013), mammal (Child et al. 2016), bird (Taylor et al. 2015), and butterfly (Mecenero et al. 2020) conservation assessments. ➢ Species listed in terms of Section 56 of the National Environmental Management: Biodiversity Act, 2004 (NEMBA) (Act 10 of 2004, as amended), and regulated by the Threatened or Protected Species (TOPS) Regulations, 2007 (Published in Government Notice 255 of 2015 in Government Gazette 38600 of 31 March 2015). Includes species that are Critically Endangered, Endangered, Vulnerable, and Protected.

In addition to Faunal SCC, the assessment also identified:

- Species protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Species listed in terms of the Nature and Environmental Conservation Ordinance (NECO) (No 19 of 1974).

The inclusion of faunal species on CITES Appendices (I–III) and NECO Schedules (1–2) are not necessarily equivalent to the species' conservation status. Many common species are pragmatically included on these lists even though their conservation status may not be of demonstrated concern. A permit is required for the removal of species that occur on CITES and NECO lists.

Expected Faunal SCC with very low detection probabilities were assessed according to the following criteria:

1. Probability of occurrence in the project area (4 categories: confirmed [observed during the site visit], high, medium, and low),
2. Potential distribution within the project area, and
3. Current threats (not project related).

Several sensitive animal species, identified by the DFFE National Web-based Environmental Screening Tool as important, required specific consideration. These species include:

Sensitivity	Feature(s)
High	Aves-*Circus ranivorus*
High	Aves – *Circus maurus*
High	Aves-*Neotis denhami*
High	Aves-*Bradypterus sylvaticus*
Medium	Invertebrate-*Aneuryphymus montanus*
Medium	Aves-*Tyto capensis*
Medium	Aves – *Afrotis afra*

Sensitivity	Feature(s)
Medium	Sensitive species 8
Medium	Mammalia-*Chlorotalpa duthieae*
Medium	Sensitive species 5

Because the likelihood of detecting any of the above listed Animal SCC during the site assessment is extremely low (even with optimal search methods and during optimal seasonal sampling; SANBI 2020) the precautionary principle was applied when assessing habitat suitability for these species in the project area.

Potentially suitable habitat exists in proximity of known locations for the species, then the species is assigned a high probability of occurrence and assumed to be present.

The following criteria were evaluated during the site visit to assess habitat suitability for these species:

1. Vegetation type and cover,
2. Presence of host plants (in the case of butterflies),
3. Geology and soil type,
4. Rock cover,
5. Topography,
6. Habitat disturbance, and
7. Habitat connectivity.

2.4. Biodiversity classification

Critical Biodiversity Areas (CBAs) are features critical for the conservation of biodiversity and maintenance of ecosystem functioning and should remain in a natural state as far as possible. CBAs also include freshwater components.

To assist in the development of these CBAs, each planning unit was classified by C-plan and Marxan based on a combination of factors including vegetation type, connectivity, habitat condition and presence of Red List Threatened species.

All features were grouped into the following CBA categories as listed in the Nelson Mandela Bay Municipality Bioregional Plan (NMBM BP; 2014) Handbook:

Critical Biodiversity Area Category	Critical Biodiversity Area Name
Protected areas 1 (PA1)	Protected areas managed by SAN Parks, provincial or local authorities, parastatals (e.g. NMMU), or the private sector. Includes National Parks, Provincial, Local and Private Nature Reserves. These areas must be maintained as Protected Areas
Protected areas 2 (PA2)	National Parks, Provincial, Local, Private Nature Reserves pending declaration. These areas must be declared and maintained as Protected Areas.
Critical Biodiversity Area (CBA)	All Critically Endangered habitats, ecological process areas, ecological corridors, habitats for Species of Special Concern, and some Endangered, Vulnerable or Least Threatened habitats. Such areas must be managed for

Critical Biodiversity Area Category	Critical Biodiversity Area Name
	biodiversity conservation purposes and incorporated into the protected area system.
Ecological Support Area 1(ESA1)	Agricultural or partly degraded land that plays an important role in ecosystem functioning and / or provides connectivity between natural areas. Such areas must be maintained for extensive agricultural or similar low intensity purposes and managed to promote ecological connectivity.
Ecological Support Area 2(ESA2)	Areas severely disturbed or transformed by human activities (e.g. mining), requiring restoration or rehabilitation. Such areas must be restored or rehabilitated to support ecological connectivity. Such areas must not be developed or utilised for medium to high intensity purposes (e.g. crop production, residential, industry etc.).
Other Natural Areas (ONA)	Natural areas that are not required to meet biodiversity targets. As per the Municipal SDF or local SDFs.
No Natural areas Remaining (DEV)	Areas severely disturbed or transformed by human activities with no natural habitat remaining, including airfields, cultivated lands, forestry plantations, industry, mines and quarries, severe overgrazing, and urban and rural development. As per the Municipal SDF or local SDFs.

2.5. Protected areas

The National Environmental Management Protected Areas Act (No 57 of 2003; NEMPAA) was developed to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. Refer to section 4.8 for more detail on this matter.

The NEMBA National List of Ecosystems that are Threatened and in need of Protection (G. NR. 1002 of 2011) contains a national list of threatened terrestrial ecosystems. Refer to section 4.8 for more detail.

2.6. Site ecological importance

The Screening Tool has identified species and ecosystem spatial triggers likely to indicate environmental sensitivity associated with a particular proposed development site, which in turn determined the necessity and requirements for conducting Specialist Assessments. The Species Environmental Assessment Guideline (SANBI; 2022) provided methodology for the identification of environmental sensitive areas within the PAOI.

Site Ecological Importance (SEI) is a function of the biodiversity importance (BI) of the identified receptor (e.g. species of conservation concern, the vegetation/fauna community or habitat type present on the site) and its resilience to impacts (receptor resilience [RR]):

SEI = BI + RR

BI in turn is a function of conservation importance (CI) and the functional integrity (FI) of the receptor:

BI = CI + FI

Conservation Importance

CI is defined as '*The importance of a site for supporting biodiversity features of conservation concern present, rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes*.' These criteria are defined as follow:

- **IUCN threatened and Near Threatened species** (CR, EN, VU and NT). Where the global (IUCN) and national assessments (SANBI Red List) differ for the same taxon, the national evaluation of status should be used in calculating SEI unless the global assessment is both more recent and of a more threatened category.
- **Rare species** are those included on South Africa's National Red List as Rare or Critically Rare or Extremely Rare.
- **Range-restricted species** – the presence of terrestrial flora, vertebrate and invertebrate fauna with a global population extent of occurrence (EOO) of 10 000 km^2 or less.
- **Globally significant populations of congregatory** species – a roughly estimated proportion (%) of the global population of a fauna species that congregate for breeding/feeding/ hibernation/other reasons.
- **Significant areas of threatened vegetation types** – this is a function of both the area (size) being considered in relation to the total extent of that vegetation type (i.e. proportion) and how threatened (CR, EN, VU) the vegetation types are.
- **Natural processes** – natural unmanaged areas with low levels of ecological disturbance have largely intact natural processes such as pollination, seed dispersal and migration, and thus have greater intrinsic conservation importance than those that are modified through ecological disturbance.

While most of the features in the CI will be provided by the screening tool, it is important to note that CI is evaluated at a much finer spatial scale and based on fieldwork data collection and comprehensive desktop analyses performed during the site visit. CI is determined for each identified habitat/vegetation unit within the entire PAOI.

The following table was used to determine CI for each receptor:

Table 2.1: Conservation importance (CI) criteria.

CI	Criteria
Very high	➢ Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km^2. ➢ Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type. ➢ Globally significant populations of congregatory species (> 10% of global population).
High	➢ Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km^2. Include if there are less than 10 locations or < 10 000 mature individuals remaining. ➢ Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. ➢ Presence of Rare species. ➢ Globally significant populations of congregatory species (> 1% but < 10% of global population).

CI	Criteria
Medium	➢ Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) and which have more than 10 locations or more than 10 000 mature individuals. ➢ Any area of natural habitat of threatened ecosystem type with status of VU. ➢ Presence of range-restricted species. ➢ > 50% of receptor contains natural habitat with potential to support SCC.
Low	➢ No confirmed or highly likely populations of SCC. ➢ No confirmed or highly likely populations of range-restricted species. ➢ < 50% of receptor contains natural habitat with limited potential to support SCC.
Very low	➢ No confirmed and highly unlikely populations of SCC. ➢ No confirmed and highly unlikely populations of range-restricted species. ➢ No natural habitat remaining.

Functional Integrity

FI is defined as "*A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts."* These criteria are defined as follow:

Connectivity to other natural areas – connectivity, which can also be measured conversely as the degree of habitat fragmentation, refers to how connected habitat patches are to each other, which has a significant influence on numerous ecological processes, such as migration and dispersal opportunities of biota and therefore genetic exchange between populations. Connectivity to other similar habitats becomes more important as the remaining intact and functional area of a habitat decreases, mainly because population sizes decrease and are therefore at greater risk from ecological perturbations and inbreeding effects. The degree of connectivity between habitat patches varies greatly with the dispersal ability of the taxon or taxon group (e.g. fossorial reptiles) in question.

Degree of current persistent negative ecological impacts – persistent negative impacts such as uncontrolled spread of alien and invasive flora effectively decreases both the remaining intact area and ecosystem functioning of a particular habitat.

Remaining intact and functional area – the proportion of the receptor that supports natural habitat with intact ecological processes – small areas are less likely to withstand ecological degradation compared to large areas, and the latter are therefore better able to maintain structure and function allowing for intact ecological processes. Ecological processes can be mostly intact and functional if the receptor area has low levels of current ecological disruptors, has good connectivity to other areas and is a relatively large area.

The following table was used to determine FI for each receptor:

Table 2.2: Functionality integrity (FI) criteria.

GI	Criteria
Very high	➢ Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. ➢ High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. ➢ No or minimal current negative ecological impacts with no signs of major past disturbance (e.g. ploughing).

GI	Criteria
High	➢ Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. ➢ Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches. ➢ Only minor current negative ecological impacts (e.g. few livestock utilising area) with no signs of major past disturbance (e.g. ploughing) and good rehabilitation potential.
Medium	➢ Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. ➢ Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. ➢ Mostly minor current negative ecological impacts with some major impacts (e.g. established population of alien and invasive flora) and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	➢ Small (> 1 ha but < 5 ha) area. ➢ Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. ➢ Several minor and major current negative ecological impacts.
Very low	➢ Very small (< 1 ha) area. ➢ No habitat connectivity except for flying species or flora with wind-dispersed seeds. ➢ Several major current negative ecological impacts.

Biodiversity Importance

Recalling that BI is a function of CI and the FI of a receptor. BI can be derived from the following matrix of CI and FI:

Table 2.3: Biodiversity importance (BI) matrix.

Biodiversity Integrity (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very low
Functional integrity (FI)	Very high	Very high	Very High	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Receptor Resilience

RR is defined as "*The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention*."

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor and require justification. RR will be evaluated and justified for each evaluation based on the criteria below.

Table 2.4: Receptor resilience (RR) criteria.

RR	Criteria
Very high	➢ Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.

RR	Criteria
High	➢ Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	➢ Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
Low	➢ Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
Very low	➢ Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

After evaluation of both BI and RR as described above, it is possible to evaluate SEI from the final matrix in Figure 2.3.

SEI description

The SEI was described in the above manner for each impact receptor identified within the PAOI and mapped in Section 5 of this report. The guidelines below (Figure 2.5) were used to interpret the SEI outcomes:

Table 2.5: Guidelines for interpreting SEI in the context of the proposed development activities

SEI	Interpretation in relation to proposed development activities
Very high	➢ Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e. last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	➢ Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	➢ Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities
Low	➢ Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities
Very low	➢ Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required

2.7. Impact assessment

The impacts that may result from the planning and design phase, construction phase, operation phase of the proposed development was assessed according to several criteria to arrive at an overall significance rating. The criteria used were as follows (based on DEAT 2002 - Impact Significance, IEM Information Series 5; and DEAT 2006 - Assessment of Alternatives and Impacts in support of the EIA Regulations, IEM Guideline Series 5):

Table 2.6: Criteria used in determining significance ratings to potential impacts

<table>
<tr><th>ASPECT</th><th>IMPACT RATING</th></tr>
<tr><td>Status of the Impact</td><td>A statement of whether the impact is positive (a benefit), negative (a cost), or neutral</td></tr>
<tr><td>Direct impact</td><td>Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.</td></tr>
<tr><td>Indirect Impacts</td><td>Indirect impacts are not a direct result of the project but are often produced away from or because of a complex impact pathway related to the project.</td></tr>
<tr><td>Cumulative Impacts</td><td>Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of the past, present, or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.</td></tr>
<tr><td>Nature of the Impact</td><td>The evaluation of the nature is impact specific. Most negative impacts will remain negative, however, after mitigation, significance should reduce to:
➢ Positive
➢ Negative</td></tr>
<tr><td>Extent</td><td>A description of whether the impact would occur on a scale limited to within the study area (local), limited to within 5 km of the study area (area) on a regional scale. i.e. the Nelson Mandela Metro & Eastern Cape (Region); or would occur on a national or international scale.
<table>
<tr><td>Local</td><td>1</td></tr>
<tr><td>Area</td><td>2</td></tr>
<tr><td>Regional</td><td>3</td></tr>
<tr><td>National</td><td>4</td></tr>
<tr><td>International</td><td>5</td></tr>
</table></td></tr>
<tr><td>Duration</td><td>A prediction of whether the duration of the impact would be immediate and once-off (less than one month), more than once, but short term (less than one year), regular, medium term (1 to 5 years), long term (6 to 15 years), project life/permanent (> 15 years, with the impact ceasing after the operational life of the development or should be considered as permanent).
<table>
<tr><td>Immediate</td><td>1</td></tr>
<tr><td>Short term</td><td>2</td></tr>
<tr><td>Medium term</td><td>3</td></tr>
<tr><td>Long term</td><td>4</td></tr>
<tr><td>Project life/permanent</td><td>5</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>ASPECT</th><th>IMPACT RATING</th></tr>
<tr><td>Intensity</td><td>This provides an order of magnitude of whether or not the intensity (magnitude/size/frequency) of the impact would be negligible, low, medium, high or very high. This is based on the following aspects:
➢ An assessment of the reversibility of the impact (permanent loss of resources, or impact is reversible after project life;
➢ Whether or not the aspect is controversial;
➢ An assessment of the irreplaceability of the resource loss cause by the activity (whether the project will destroy the resources which are easily replaceable, or the project will destroy the resources which are irreplaceable and cannot be replaced;
➢ The level of alteration to the natural system, processes or systems.
<table>
<tr><td>Negligible</td><td>The impact does not affect physical, biophysical or socio-economic functions and processes.</td><td>1</td></tr>
<tr><td>Low/potential harmful</td><td>The impact has limited impacts on physical, biophysical or socio-economic functions and processes.</td><td>2</td></tr>
<tr><td>Medium/slightly harmful</td><td>The impact has an effect on physical, biophysical or socio-economic functions and processes, but in such a way that these processes can still continue to function albeit in a modified fashion.</td><td>3</td></tr>
<tr><td>High/harmful</td><td>Where the physical, biophysical or socio-economic functions and processes are impacted on in such a way as to cause them to temporarily or permanently cease.</td><td>4</td></tr>
<tr><td>Very high/disastrous</td><td>Where the physical, biophysical or socio-economic functions and processes are highly impacted on in such a way as to cause them to permanently cease.</td><td>5</td></tr>
</table></td></tr>
<tr><td colspan="2">Severity (extent + duration + intensity)</td></tr>
<tr><td>Frequency</td><td>This provides a description of any repetitive, continuous or time-linked characteristics of the impact: Once-off (occurring any time during construction or operation); intermittent (occurring from time to time, without specific periodicity); periodic (occurring at more or less regular intervals); continuous (without interruption).
<table>
<tr><td>Once-off</td><td>Once</td><td>1</td></tr>
<tr><td>Rare</td><td>1/5 to 1/10 years</td><td>2</td></tr>
<tr><td>Frequent</td><td>Once a year</td><td>3</td></tr>
<tr><td>Very frequent</td><td>Once a month</td><td>4</td></tr>
<tr><td>Continuous</td><td>≥ once a day/per shift</td><td>5</td></tr>
</table></td></tr>
<tr><td>Probability of occurrence</td><td>A description of the chance that consequences of that selected level of severity could occur during the exposure.
<table>
<tr><td>Highly unlikely</td><td>The probability of the impact occurring is highly unlikely due to its design or historic experience.</td><td>1</td></tr>
<tr><td>Improbable</td><td>The probability of the impact occurring is low due to its design or historic experience.</td><td>2</td></tr>
<tr><td>Probable</td><td>There is a distinct probability of the impact occurring.</td><td>3</td></tr>
<tr><td>Almost certain</td><td>It is most likely that the impact will occur</td><td>4</td></tr>
<tr><td>Definite</td><td>The impact will occur regardless of any prevention measures.</td><td>5</td></tr>
</table></td></tr>
<tr><td colspan="2">Incidence (frequency + probability)</td></tr>
</table>

ASPECT	IMPACT RATING
Risk rating	The risk rating is calculated based on input from the above assessments. The incidence of occurrence is calculated by adding the extent of the impact to the duration of the impact. The severity of the impact is calculated based on input from the extent of the impact, the duration and the intensity. **Risk = Severity (extent + duration + intensity) x Incidence (frequency + probability)** **Significance:** The significance of the risk based in the identified impacts has been expressed qualitatively as follows: ➢ **Low –** the impact is of little importance/insignificant but may/may not require minimal management. ➢ **Medium –** the impact is important; management is required to reduce negative impacts to acceptable levels. ➢ **High –** the impact is of great importance, negative impacts could render development options or the entire project unacceptable if they cannot reduce to acceptable levels and/or if they are not balanced by significant positive impact, management of impacts is essential.

Based on a synthesis or combination of the information contained in the above-described criteria; and drawing on legal policies and guidelines as well as the status of the impacts and potential risks, the overall significance were determined as follows:

Table 2.7: Definition of significance ratings (positive and negative)

Significance	Description
Very high (VH) (150+)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
High (H) (101-149)	An impact of high significance which could influence a decision about whether to proceed with the proposed project, regardless of available mitigation options.
Medium (M) (51-100)	If left unmanaged, an impact of medium-high significance could influence a decision about whether to proceed with a proposed project. An impact of Low-medium significance would have some effect during decision making about whether to proceed with a proposed project, however, mitigation for this type of impact is manageable.
Low (L) (25-50)	An impact of low significance would have little effect on decision making and only a small influence on project design or alternative motivation.
Very low (VL) (1-24)	An impact of very low significance is likely to contribute to positive decisions about whether to proceed with the project. It will have little effect and is unlikely to have an influence on project design or alternative motivation.
Negligible / zero impact	There will be no impact, or any impact identified can be viewed as negligible. This rating will be unlikely to have an influence on project design or alternative motivation.
Positive impact (+)	A positive impact is likely to result in a positive consequence/effect and is likely to contribute to positive decisions about whether to proceed with the project.

3. Site assessment

This chapter compares baseline information with field survey data collected. A site visit was conducted on the 5th October 2023. Date collected during the site visit was then compared to existing literature on the site which included vegetation and animal classifications as well as biodiversity programmes and plans.

3.1. Topography

The landscape within the proposed development site is flat with a very low undulating flat landscape. The study area is located at 180m above sea-level (Figure 3.1).

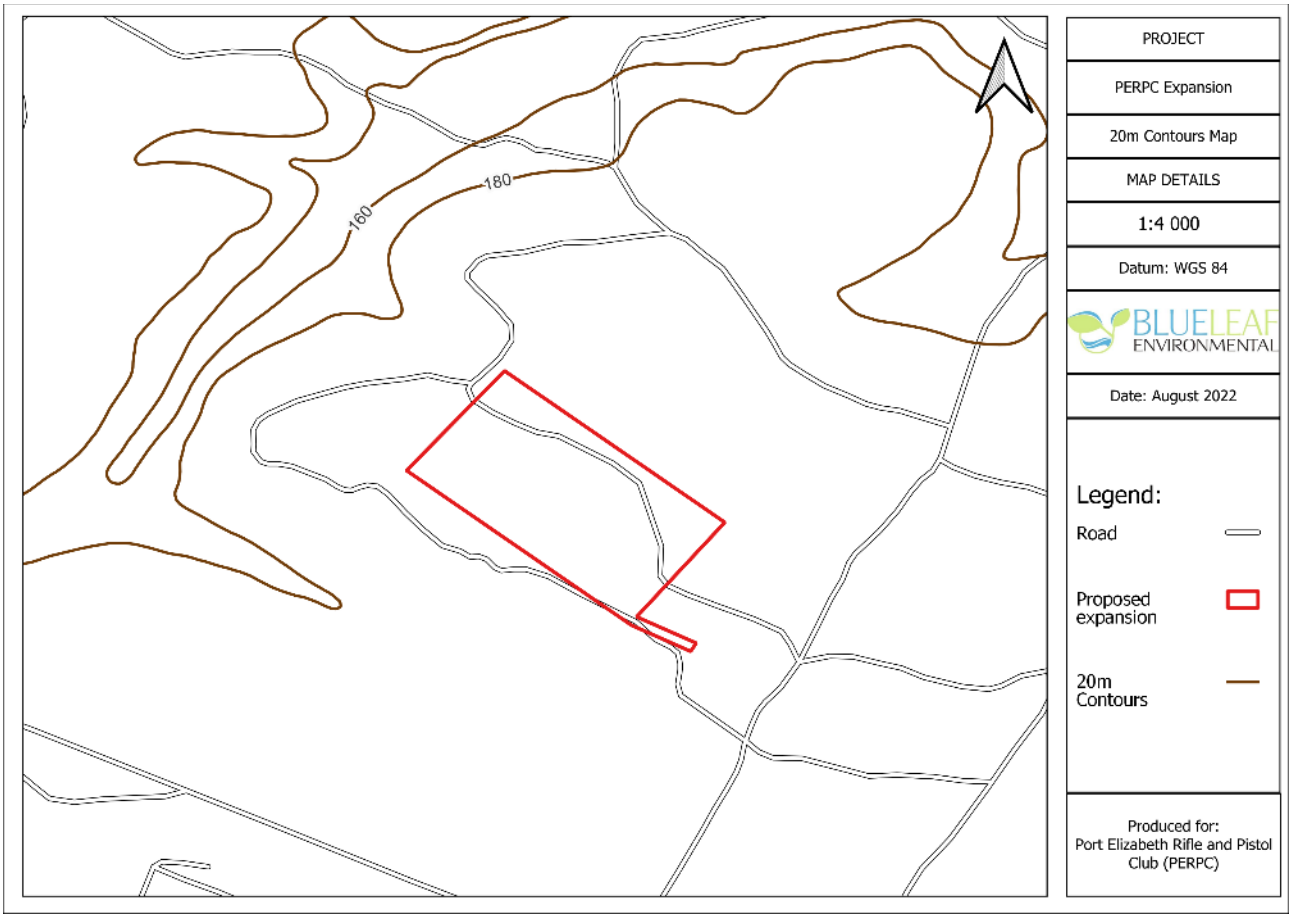

Figure 3.1: Topography of the proposed development and surrounding areas.

3.2. Local climate

The climate in Port Elizabeth, the nearest town with climate data, is considered as subtropical oceanic with mild winters, warm summers, and occasional wind. Port Elizabeth receives mostly winter rainfall (August). Rain is infrequent but averages around 625 mm annually. Temperatures average at 15°C. February is the hottest month of the year with average temperatures of 22°C, and July the coldest at 14.6°C.

3.3. Geology and Soils

Rocks within the entire site is uniform. It consists of Ordovician sandstones from the Table Mountain Group (Cape Supergroup). Soil is acidic lithosol with land types being mostly Db and Ha.

3.4. Land use

Current land use has been determined and the map in Figure 3.2 shows that almost the entire study site is covered by transformed natural vegetation dominated by wattle and gum woodlots. These atrea have been transformed because of historical surface mining (probably for sand and gravel). Intact endemic vegetation can be found on a small portion (1.65 ha) within the proposed expansion site.

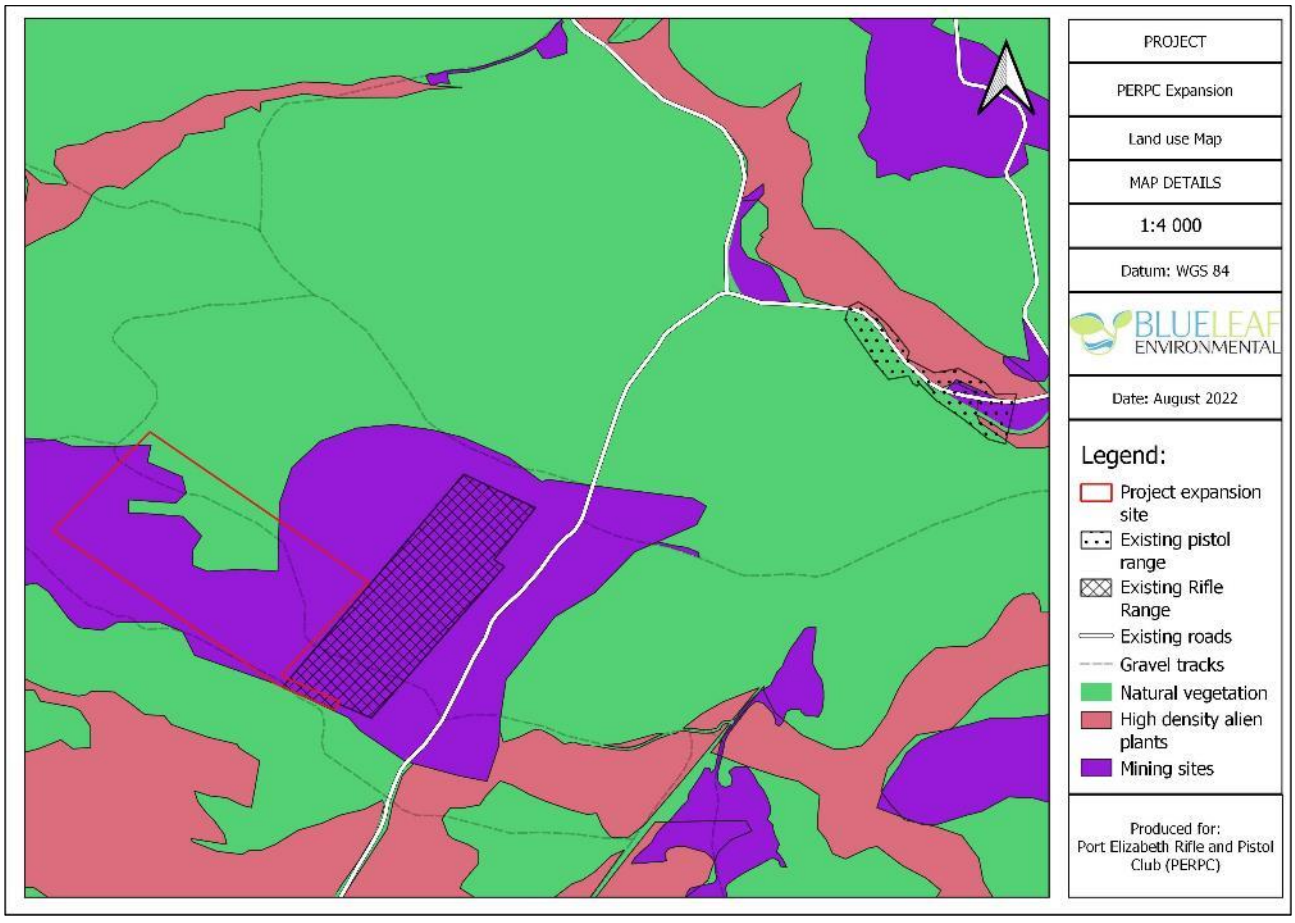

Figure 3.2: Land use map of the proposed development and surrounding areas.

Below is a photo sequence of the site illustrating land cover for the expansion site and surrounding areas:

Photos of the site	Description
	The proposed expansion site is mostly made up of transformed vegetation with a large component being alien invasive species interspersed with some individual endemics.
	A large component (over 80%) of the vegetation has been completely transformed. Soil profiles are also altered through historic surface mining.
	The sand mounds to the left of the image, shows that the site has historically been mined for sand. There has also been intensive illegal cutting down of trees for firewood use.

3.5. Vegetation

The site was first described according to available literature and databases. A site visit was conducted to confirm and describe the vegetation as well as the condition of each vegetation unit.

3.5.1. Regional-scale vegetation mapping

The national vegetation classification system called the SANBI VegMap (2018) identifies two (2) vegetation types within the PERPC expansion site namely **Algoa Sandstone Fynbos** and **Bethelsdorp Bontveld** (Figure 3.3).

Algoa Sandstone Fynbos occurs on coastal flats in the port Elizabeth area. Vegetation supports grassy shrubland (mainly graminoid fynbos) with grasses dominating in wet habitats. SANBI classifies this vegetation as **critically endangered** with about only 2% conserved in the Van Stadens Wild Flower Reserve and some other private nature reserves. More than 50% has been transformed already through cultivation and urban sprawl of the Metro). Up to 80% of the proposed PERPC extension land area is covered by by this vegetation type.

Bethelsdorp Bontveld forms part of the Albany Thicket biome and is found on steep slopes of deeply incised valleys. It consists of a mosaic of low thicket (2 - 3 m in height) consisting of bush clumps in a matrix of low, succulent-rich shrubland comprising of renosterveld and succulent karroid elements. Several of the tree and shrub species that make up the bush clumps (e.g. *Smelophyllum capense*) are shared with Baviaans Valley Thicket. SANBI classifies this vegetation as **least concerned.**

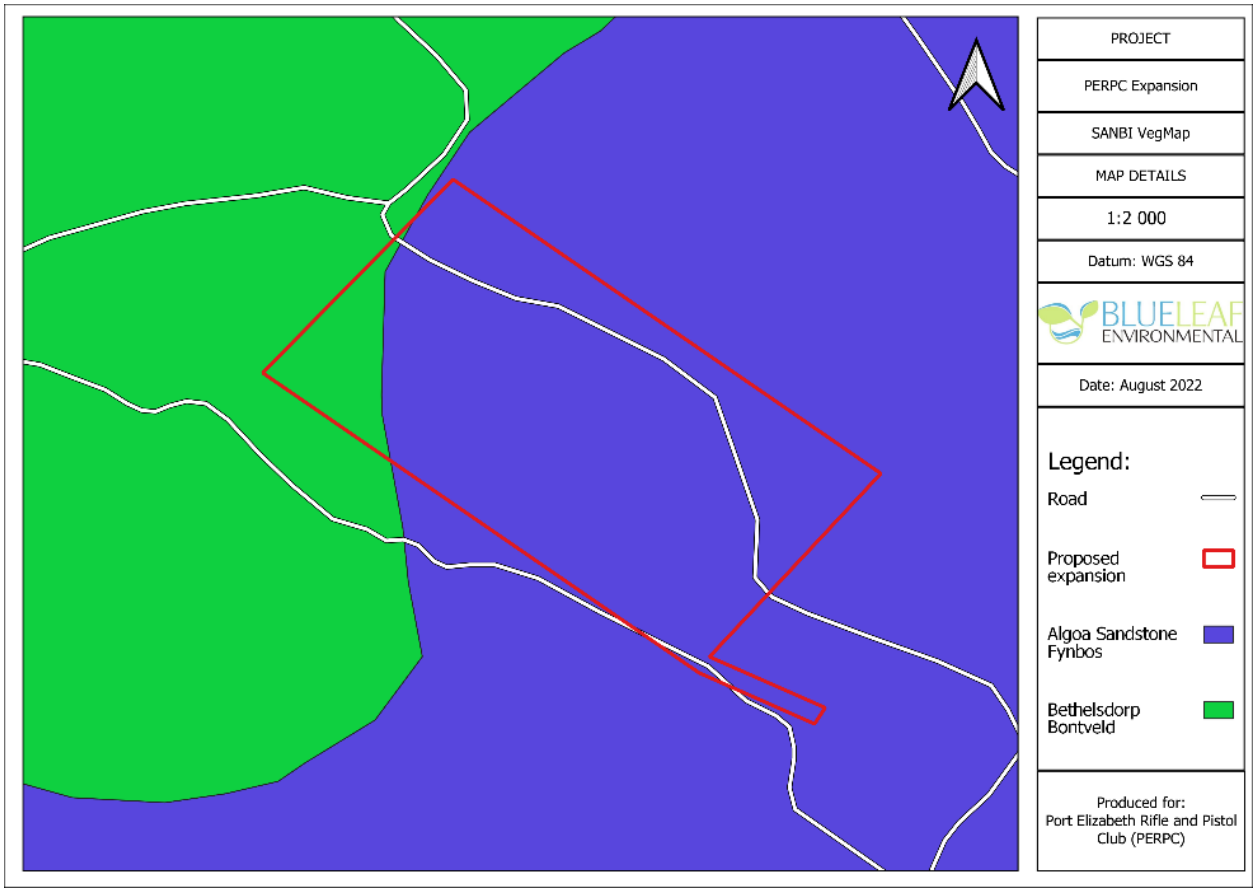

Figure 3.3: SANBI VegMap of the study area and surroundings.

3.5.2. Fine-scale vegetation mapping

During the site visit and assessment, two vegetation types was identified within the expansion site (Figure 3.4) namely:

1. Transformed vegetation.
2. Degraded fynbos.

Transformed vegetation.

Historical surface mining and alien infestation (mostly wattle) has completely transformed up to 76% of the land cover (5.13 ha) within the expansion site (Figure 4.4). Soils in this area has been completely altered by removal and stockpiling of topsoil during mining and as a result vegetation cannot be considered as remnants of the original vegetation types (either Algoa Sandstone Fynbos or Bethelsdorp Bontveld). Vegetation is dominated by dense clusters of wattle and gum trees with little to no shrubs and herbs.

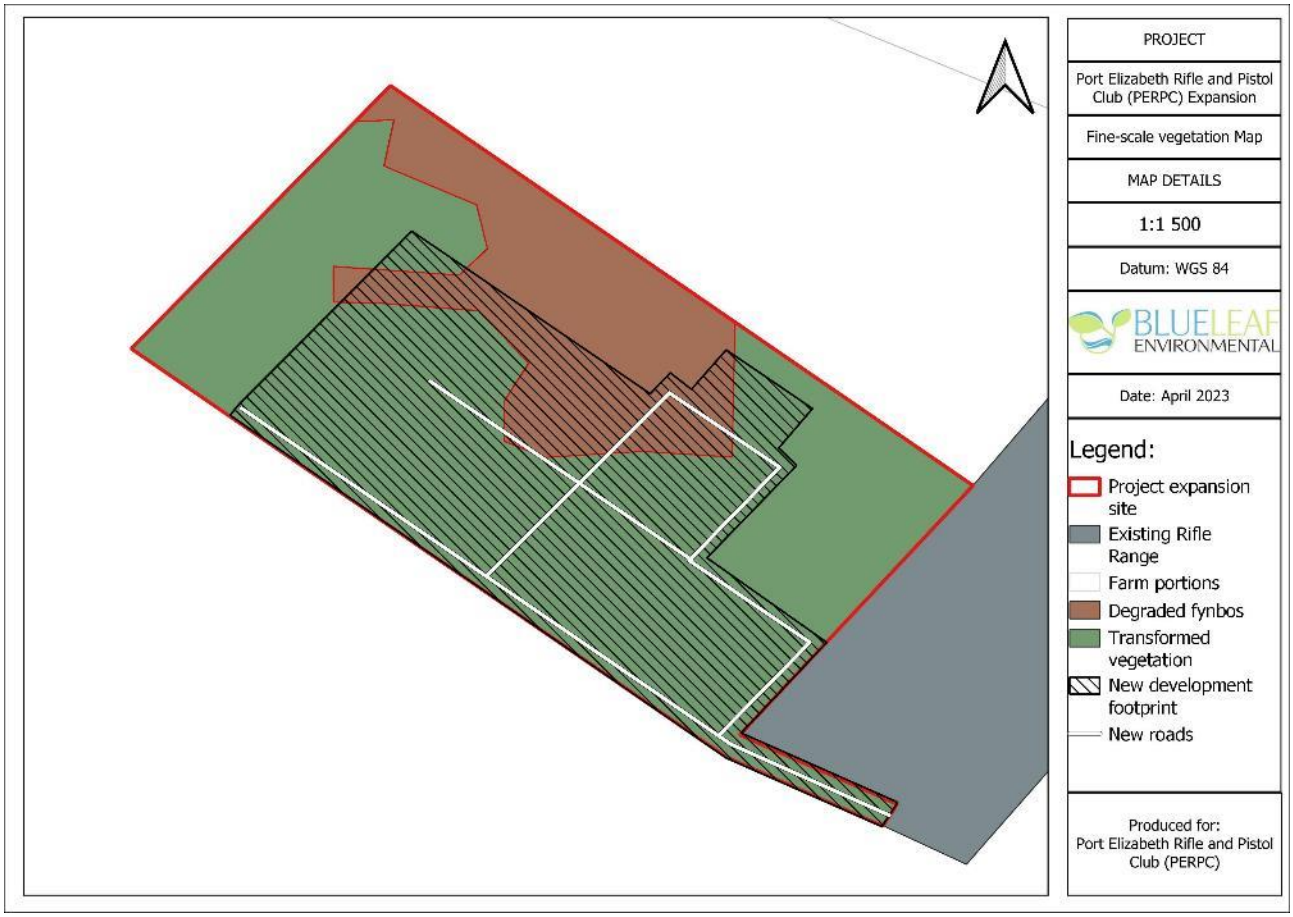

Figure 3.4: Fine-scale vegetation map of the study site.

Below is a photo sequence illustrating typical transformed vegetation found on site:

Dense wattle woodlots occur with little to no underbrush:




Soil stockpiles surrounded by dense wattle lots occur:


Wattle is illegally harvested on site:	
	

Degraded fynbos.

A small portion of land (approx. 24% of the land cover; 1.65 ha) in the north of the proposed expansion site consist of wattle woodlots interspersed with a grassy fynbos matrix (Figure 3.4). The grassy fynbos component is considered remnants of the original Algoa Sandstone Fynbos vegetation as some of the plant species are typically found in this vegetation type. Not all the typical Algoa Sandstone Fynbos species occur on site and wattle makes more than 60% of the plants classifying this vegetation type as degraded. Some sensitive plants were observed. Refer to section 3.6 for more details on plant species.

Only 0.7 ha of this fynbos layer will be permanently lost through the development while the remainder within the development footprint will remain unaffected. Considering that up to 1.1 ha of the old pistol range will be reverted to natural vegetation, there will be no nett loss of sensitive fynbos on site.

Below is a photo sequence illustrating typical degraded fynbos found on site:

Dense wattle woodlots occur with little to no underbrush. Fynbos can be seen in the foreground:	
	

3.6. Plant species

A list including all plants observed during the site visit as well as potential plant species that may occur on site (as per literature) are included in Appendix A. Species SCC listed in the Screening Report are also included regardless of being found on site or not. According to SANBI, the names of some of the species identified in the Screening Report may not appear in the final BAR report nor any of the specialist reports released into the public domain and are therefore just referred to as "*Sensitive Species #".* All SCC (Table 3.1) as well as plants not considered as SCC but still requiring permits for removal (Table 3.2) were noted and recorded. It was also noted whether the plant species was observed on site or not. Of the fifty-seven (57) potential species that may occur on site, only three (3) plant SCC were observed during the site visit.

Table 4.1: Plant SCC that may occur on site. Species observed are highlighted

FAMILY	GENUS	SPECIES	COMMON NAME	RED DATA LIST SPECIES	OBSERVED ON SITE
	Sensitive species 1252			VU	No
	Sensitive species 991			CR	No
	Sensitive species 1268			CR	No
	Sensitive species 588			VU	No
	Sensitive species 657			EN	Yes
	Sensitive species 670			VU	No
	Sensitive species 570			EN	No
	Sensitive species 448			VU	No

FAMILY	GENUS	SPECIES	COMMON NAME	RED DATA LIST SPECIES	OBSERVED ON SITE
	Sensitive species 654			VU	No
Acanthaceae	Justicia	orchioides	Ribbokbos	VU	No
Asteraceae	*Euryops*	*ericifolia*	Euryops	EN	Yes
Aizoacaeae	Corpuscularia	lehmannii	Ice-plant	CR	No
	Bergeranthus	addoensis	Bergeranthus	NT	No
	Erepsia	aristate	Eastern Spoonfig	EN	No
Amaryllidaceae	Apodolirion	macowanii	Apodolirion	VU	No
Fabaceae	Lotononis	acuminata		VU	No
Geraniaceae	Pelargonium	reniforme	Kidney-leaved pelargonium	NT	Yes

Table 4.2: Plants not considered as SCC but will still require permits.

FAMILY	GENUS	SPECIES	COMMON NAME	RED DATA LIST SPECIES	Observed on site
Amaryllidaceae	Cyrtanthus	obliquus	Knysna lily	PNCO	No
Amaryllidaceae	Haemanthus	sanguineus	April fool	PNCO	No
Apocynaceae	Microloma	tenuifolium	Kannetjie	PNCO	No
Asphodelaceae	*Aloe*	*micracantha*	Wateraalwyn	PNCO	Yes
Asphodelaceae	*Bulbine*	*abyssinicia*	Bulbine	PNCO	Yes
Asphodelaceae	*Bulbine*	*nascissifolia*	Strapped leaved bulbine	PNCO	Yes
Ericaceae	Erica	cerinthoides	Fire Erica	PNCO	Yes
Iridaceae	Bobartia	orientalis	Biesie	PNCO	No

Some of the plants observed on site are illustrated below:

Euryops ericifolius

Bulbine abyssinica

Agathosma ovata

Agathosma capensis

Aloe micracantha

Bulbine narcissifolia

	
Metalasia muricata	Pelargonium reniforme
	
Erica cerinthoides	*Chironia tetragona*
	
Drimia capensis	*Hermannea flammea*
	
Achyranthemum affine:	

3.7. Animal species

No animal species were observed within the study site upon site visit. The Screening Report lists animal SCC that may occur in the area (Table 4.3). If any traces of a specific animal were observed within the site, like droppings, spoor, and burrows, the animals that made them were listed as present on site.

Table 4.3: Animal species listed in the DFFE Screening Report

Sensitivity	Feature(s)
High	Aves-*Circus ranivorus*
High	Aves-*Neotis denhami*
High	Aves-*Circus maurus*
High	Aves-*Bradypterus sylvaticus*
Medium	Invertebrate-*Aneuryphymus montanus*
Medium	Aves-*Tyto capensis*
Medium	Aves-*Afrotis afra*
Medium	Mammalia-*Chlorotalpa duthieae*
Medium	Sensitive species 5
Medium	Sensitive species 8

The chances of any of these animals occurring on site is very low. The site is highly degraded with little habitat or food sources remaining for most of the listed species. This site is also immediately adjacent to an existing rifle shooting range. These ranges do make a lot of loud noises making the area unsuitable for most animal species. Below is a description of each animal family.

4.7.1. Mammals

No mammals were observed within the study site. A full list of mammal species that may occur are listed in Appendix B. The Screening report lists *Chlorotalpa duthieae* (Duthie's mole) as a mammal species that may occur on site. This is a mole that is only found in the Algoa Bay area and inland but has a broad habitat range, extending into montane areas. Like all, golden moles are subterranean dwellers but does come up to forage for insects and other invertebrates.

Sensitive species # 8 may also occur on site. This is a fast but small mammal species. As this is a highly protected species prone to poaching, the name will not be released in this report or any subsequent EIA report relating to this project.

4.7.2. Avifaunal species

A list of bird species that may occur within the local area are provided in Appendix B. This list is sourced from the Southern African Bird Atlas Project 2 (SABAP2) and lists all species that were observed over time in the 3325CD quaternary within which the study site also falls. A few sensitive birds were identified by the Screening report but none of them will breed within the study site. Chances of occurrence is also low.

4.7.3. Reptiles

A list of reptiles that occur in the region are listed in Appendix B. No reptile species were observed during the site visit but that does not mean that these species are not present on site. Geckos, lizards, tortoises and snakes may occur. An animal Search & Rescue for mostly reptiles are recommended prior to commencement of any clearing activities.

4.7.4. Amphibians

No amphibians were observed on site. A variety of river frogs (*Pyxicephalidae*), Painted Reed Frogs (*Hyperolius marmoratus*), and Caco's (Cacosternum) may occur, especially during the warmer summer times. African bull frogs are known to habitat wet areas in the district, but no suitable habitats occur on site.

4.7.5. Invertebrates

It is difficult to ascertain which invertebrates occur within or could possibly occur within the project site. What needs to be stated is that several invertebrates are protected under the NEMBA (ToPS) Act. All baboon spider species in South Africa, (*Harpactirinae*) are protected under NEMBA and the Golden Baboon Spider (*Harpactira tigrine*) has been observed in the region. Certain scorpions, under the *Opisthacanthus* genus are also protected under NEMBA. Both spiders and scorpions have a moderate likelihood of occurring on site. Various butterflies and other insects were observed but none are listed as faunal SCC.

3.8. Biodiversity

Half of the proposed expansion site (approx. 3.4 ha) is in a ESA2 area while the remainder is in a CBA1 (Figure 4.6). A site visit has confirmed that most of the site is completely transformed through previous sand mining while only a small area with degraded fynbos remains. Over 5.13 of the proposed 6.78 ha of land is severely transformed. Refer to Figure 4.4 above for more information and visualisation. This area is immediately adjacent to the existing rifle range and has been completely transformed by mining. Building a rifle and pistol range on this area aligns to the NMBM BP (2014) requirements for land management. The Bioregional Plan states that these areas must be restored or rehabilitated to support ecological connectivity and NOT be developed or utilised for medium to high intensity purposes. No infrastructure will be constructed in this area and although most vegetation will be kept very short, the land will still be managed for its ecological connectivity.

The other half of the site, or, as confirmed by a site visit, only 1.65 ha of land, is considered as a CBA. This allocation is due to the SANBI sensitivity classification (critically endangered) for the local vegetation type namely Algo Sandstone Fynbos (previously called Rowellan Park Grassy Fynbos). This vegetation type, regardless of this degraded value must be managed for biodiversity conservation purposes and incorporated into a protected area system to ensure that no further loss of natural habitat should occur. If not possible, an alternative management option is to consider possible biodiversity offset.

The old pistol range, covering an area of 1.65 ha of the same sensitive vegetation will be decommissioned and rehabilitated while 1.61 ha of CBA (only 0.7 ha of fynbos vegetation) will be lost within the proposed new expansion area. This means that only 400 m^2 of sensitive CBA will be lost. One alternative may be to offset this small loss by including a buffer around the proposed new expansion area.

It must also be remembered that currently the rifle and pistol ranges are located 700 m apart and connected by a gravel road, creating 2 separate nodes of potential impact on the surrounding biodiversity. Implementing the proposed new expansion will result in all shooting ranges to be in a single location within the larger land parcel (Farm 8 portions 5 and 6).

Figure 4.5: Biodiversity map relative to the proposed study site and surrounding areas

This expansion should be approved provided the existing pistol range be decommissioned and allowed to rehabilitate back not natural vegetation.

3.9. Protected areas

No protected areas were identified within or nearby the project site.

3.10. Alien and Invasive Species

It should be noted that the CARA regulations for the legal obligations regarding alien invasive plants in South Africa have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which was promulgated on 1 October 2014. However, CARA has not been repealed and is still included as a reference point to use in terms of the management of Alien and Invasive Species (AIS) within agricultural land.

The National Environmental Management: Biodiversity Act, (Act No. 10 OF 2004; NEM:BA) provide a list of Alien and Invasive Species (AIS) for management (GN. R. 898 of 2014 as amended in 2016). AIS are classified into the following categories:

- **Category 1a** - species which must be combatted or eradicated.
- **Category 1b** - species which must be controlled.
- **Category 2** - species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit.
- **Category 3** - as species which are subject to exemptions.

3.10.1. Category 1b plants

The following Category 1b plant has been identified within the study site. These species should be removed from the area and measures should be put in place to control these species:

FAMILY	GENUS	SPECIES	COMMON NAME	RED DATA LIST SPECIES	Observed on site
Verbenaceae	*Lantana*	*camara*	Lantana	AIS Category 1b	Yes
Asteraceae	*Cirsium*	*vulgare*	Scottish thistle	AIS Category 1b	Yes
Pinaceae	*Pinus*	*sp.*	Pine tree	AIS Category 1b	Yes

3.10.2. Category 2 plants

The following category 2 plants are species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit:

FAMILY	GENUS	SPECIES	COMMON NAME	RED DATA LIST SPECIES	Observed on site
Fabaceae	*Acacia*	*mearnsii*	Black wattle	AIS Category 2	Yes
Fabaceae	*Acacia*	*cyclops*	Rooikrans	AIS Category 2	Yes
Asteraceae	*Ricinus*	*communis*	Castor oil plant	AIS Category 2	Yes
Myrtaceae	*Eucalyptus*	*sp.*	Gum tree	AIS Category 2	Yes

Below is a photo sequence of some of the alien plants found on site:

Large black wattle (*Acacia mearnsii*) woodlots occur throughout the site:	
	
Rooikrans (*Acacia cyclops*):	Pine tree:
	
Lantana:	Thistle:
	

4. Site Ecological Importance

4.1. DFFE Screening Report Sensitivity

The DFFE Screening Report has listed the **terrestrial biodiversity theme** for the site as very high. Based on the site visit and assessment, is it confirmed that the site theme sensitivity remains as high. Half of the site falls within a CBA while the remainder is in an ESA2.

The DFFE Screening Report further listed the **terrestrial plant species theme** for the site as medium. Based on the site visit and assessment, is it confirmed that the site theme sensitivity remains as medium. Three plant SCC were observed and will require permits to relocate these species prior to commencement of vegetation clearing.

The DFFE Screening Report listed the **terrestrial animal species** theme for the site as high. The site assessment confirmed this allocation and the environmental sensitivity for the Terrestrial Biodiversity theme remains as high.

4.2. Site Ecological Importance

Site Ecological Importance (SEI) was determined for the proposed PERPC Expansion development in Greenbushes, Eastern Cape. Environmental constraints were identified and aligned with specific characteristics of the site. The following site characteristics contributed to determining an overall sensitivity:

Figure 5.1: Characteristics contributing to site sensitivity

Site characteristic	Description of characteristic	Sensitivity allocation
Vegetation	Transformed landscape	Low
	Degraded fynbos	Moderate
	Alien vegetation	Low
Animals	Animal habitats	Moderate
Biodiversity	CBA areas (Reclassifying the boundaries after the site visit)	High
	Transformed ESA areas	Moderate

A detailed sensitivity map for the study area and immediate surroundings were developed for each environmental theme. This was based on the identified environmental characteristics found within the site (Figure 5.1).

4.2.1. Vegetation theme sensitivity

Only two vegetation sensitivities were identified. The largest portion of the study site are considered as low sensitive. Here. historical surface mining and alien infestation (mostly wattle) has completely transformed the land. Soils in this area has been completely altered and as a result vegetation cannot be considered as remnants of the original vegetation types (either Algoa Sandstone Fynbos or Bethelsdorp Bontveld). Vegetation is dominated by dense clusters of wattle trees with little to no shrubs and herbs. Three plant SCC were identified and observed on site.

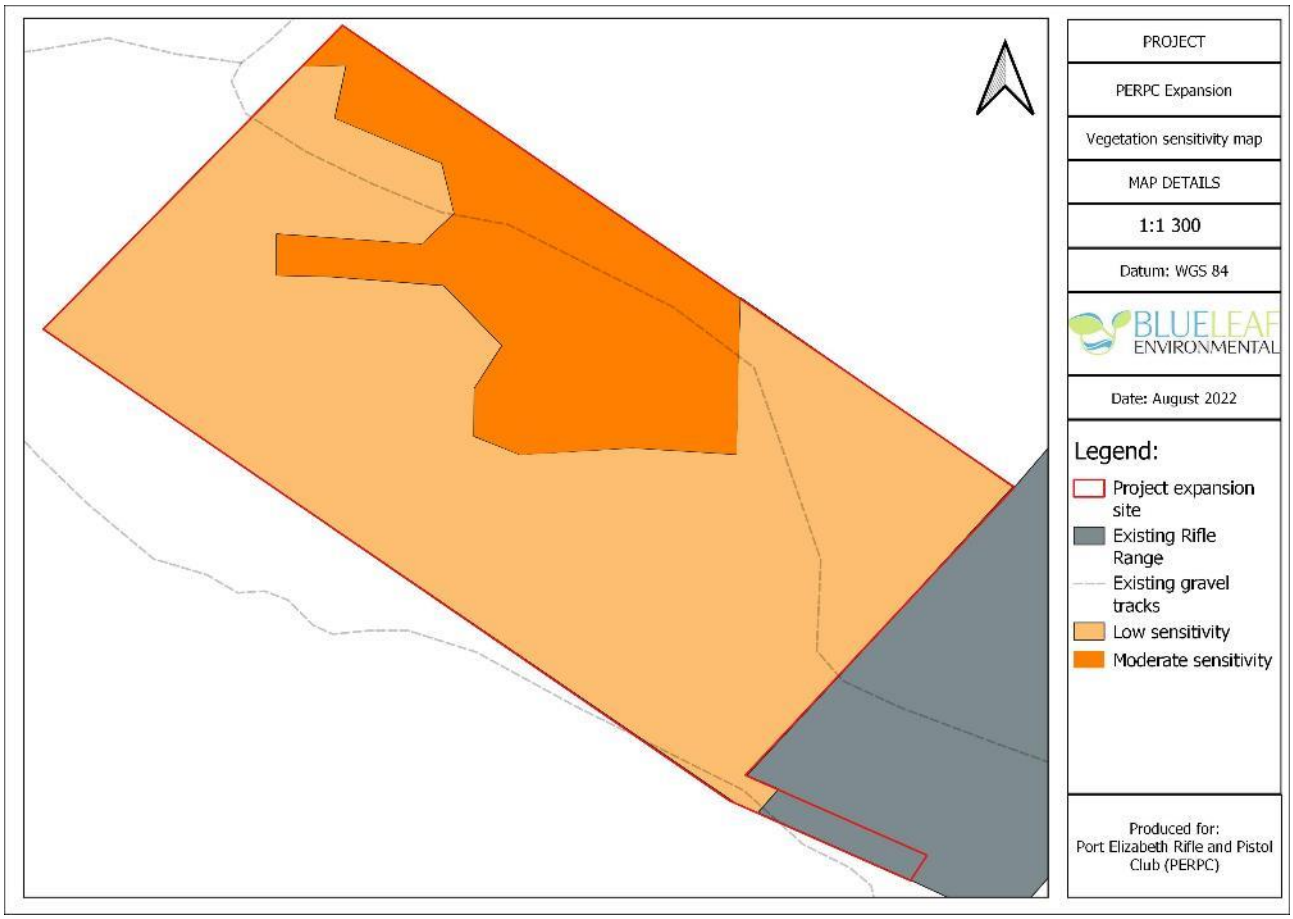

Figure 5.1: Vegetation sensitivity map for the proposed development area

A small portion of land consist of wattle woodlots interspersed with a grassy fynbos matrix. The grassy fynbos component is considered remnants of the original Algoa Sandstone Fynbos vegetation as some of the plant species are typically found in this vegetation type. Not all the typical Algoa Sandstone Fynbos species occur on site and wattle makes more than 60% of the plants classifying this vegetation type as degraded. All three plant SCC were also observed here.

4.2.2. Animal theme sensitivity

Habitats for animals are scarce so most species will not occur on site. This includes birds, moles, and invertebrates. Reptiles should be common, and a Search and Rescue is proposed for them prior to commencement of clearing.

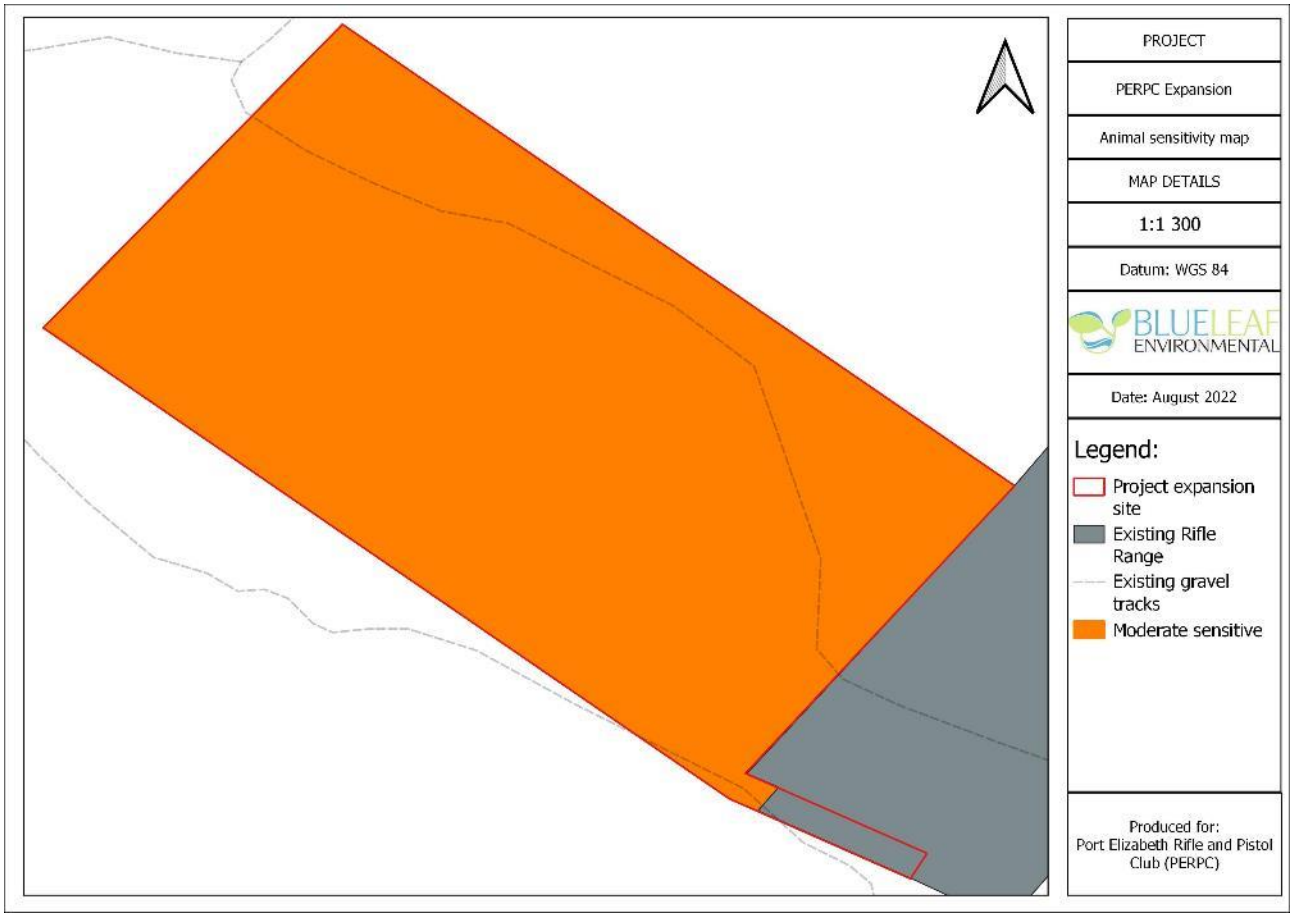

Figure 5.2: Animal sensitivity map for the proposed development area

4.2.3. Biodiversity theme sensitivity

A small portion of land – aligning with the fynbos remnant mentioned earlier – has a high sensitivity allocation. This is due to the high sensitivity of Algo Sandstone Fynbos in the area. The remainder is considered as moderate sensitivity.

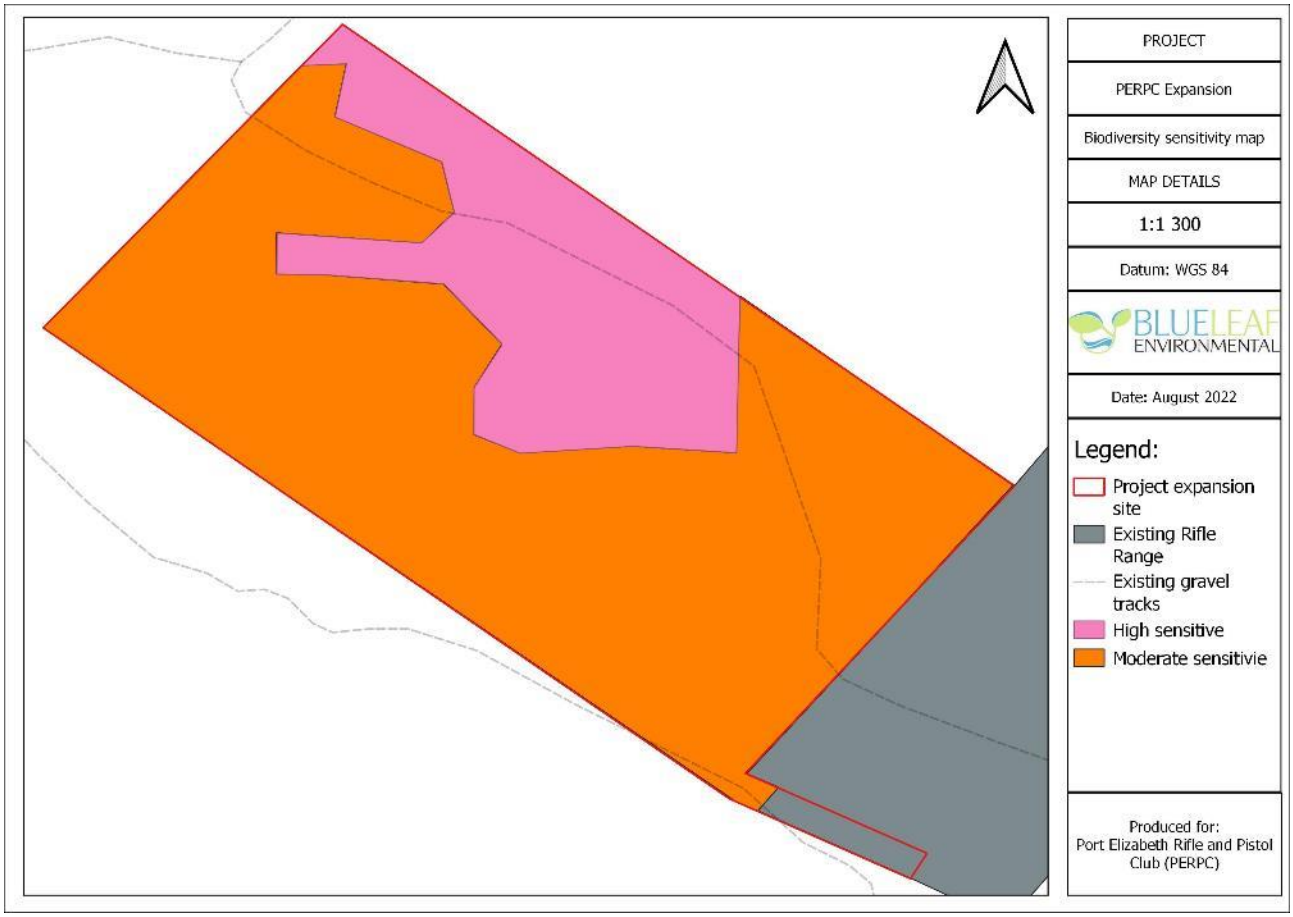

Figure 5.3: Biodiversity sensitivity map for the proposed development area

5. Impact assessment

The following issues were identified during the assessment of the proposed development.

5.1 Identified impacts

The following ecological issues were identified during the assessment of the development area:

#	Activity causing impact (Issue)	Description of impact
1	Non-compliance to existing legislation	***1.1. Legal compliance*** Non-compliance with ecological laws and policies of South Africa could lead to unnecessary delays in establishment activities, and potentially criminal cases, based on the severity of the non-compliance, being brought against the proponent and his/her contractors.
2	Vegetation clearing for construction	***2.1. Loss of natural vegetation*** Clearing will result in the loss of some fynbos vegetation.
		2.2. Loss of critical biodiversity areas Removal of natural vegetation will result in the permanent loss of biodiversity sensitive areas.
		2.3. Loss of plant SCC Clearing may result in the loss of identified and non-identified plant SCC.
		2.54. Loss of animal SCC Removal of natural habitats may result in the loss of identified and non-identified animal SCC.
		2.5. Erosion Loss of natural vegetation could lead to soil erosion***.***
		2.6. Spread of alien and invasive plant species Removal of natural vegetation will increase the risk of alien plant species invasion.

All impacts identified above were assessed as per the assessment methodology described in Chapter 3.8 of this report. Each impact was described on how it will impact within a specific phase of the project, namely Planning and Design, Construction and Operations.

Issue 1:	Non-compliance to existing legislation
Consequence of Issue	Non-compliance with ecological laws and policies of South Africa could lead to unnecessary delays in establishment activities, and potentially criminal cases, based on the severity of the non-compliance, being brought against the proponent and his/her contractors. Permits will be required for the removal of any protected plant and animal species.
Number of impacts identified associated with this issue	Only 1 (Impact 1.1)

Impact 1.1: Legal compliance
Phase of expansion: Planning and Design Phase

Nature of impact	Non-compliance with ecological laws and policies of South Africa could lead to unnecessary delays in establishment activities, and potentially criminal cases, based on the severity of the non-compliance, being brought against the proponent and his/her contractors.		
Cumulative impact	None		
Indirect impacts	None		
Residual impacts	None		
Classification of impact	Before mitigating	After mitigating	Consequence of Impact
Duration of impact	5	2	Only during construction phase.
Extent of impact	3	1	Provincial approval will be required.
Intensity of impact	5	2	Legislated approval is required to impact on any protected plants, animals, or environments.
Severity	**13**	**5**	**Duration + extent + intensity**
Probability of impact occurring	5	2	Impact will occur on commencement of construction.
Frequency	1	1	Impact will occur once only.
Incidence	**6**	**3**	**Frequency + Probability**
Degree of reversibility	High		Permits and authorisations may be required.
Irreplaceability	Low		No resource will be lost.
Mitigations	Mitigatory potential		Recommended mitigations
	High		- All relevant plant and animal removal/relocation permits must be obtained from the competent authorities to remove any protected plant species.
Significance of impact **(Severity x Incidence)**	Pre-mitigation significance		Post-mitigation significance
	Medium negative (78)		Very low negative (15)

Issue 2:	Vegetation clearing for construction
Consequence of issue	Clearing of natural vegetation will result in a loss of biodiversity and will include the loss of high value landscapes and the loss of protected plants and animal habitats.
Number of impacts	6 (Impacts 2.1 to 2.6)

Impact 2.1: Loss of natural vegetation	
Phase of expansion: Construction Phase	
Nature of impact	Clearing will result in the loss of 1.65 ha of degraded fynbos vegetation.
Cumulative impact	Reduction of overall Algoa Sandstone Fynbos vegetation.
Indirect impacts	Loss of natural habitat for various animal species.
Residual impacts	Permanent loss of natural vegetation. Up to 6.78 ha will be permanently lost.

Classification of impact	Before mitigating	After mitigating	Consequence of Impact
Duration of impact	5	5	Clearing will result in the permanent loss of 6.8 ha of natural vegetation.
Extent of impact	3	3	All the vegetation within the construction footprint will be removed.
Intensity of impact	5	2	Ecological processes will be permanently altered.
Severity	**13**	**10**	**Duration + extent + intensity**
Probability of impact occurring	5	3	Impact will occur on commencement of construction.
Frequency	5	1	
Incidence	**10**	**3**	**Frequency + Probability**
Degree of reversibility	Moderate negative		Impact cannot be reversed despite mitigation measures.
Irreplaceability	High		Vegetation will be permanently lost.
Mitigations	Mitigatory potential		Recommended mitigations
	Medium		- The construction footprint must be surveyed and demarcated prior to construction commencing. All contractors must be made aware of this demarcation. - All areas outside the demarcated footprint will be considered as No-Go areas. - No construction activities (temporary or permanent) will be allowed in these No-Go areas. - Temporary infrastructure such as the site camp, laydown areas and storage areas must be placed in areas already transformed and within the construction footprint.

Significance of impact **(Severity x Incidence)**	Pre-mitigation significance	Post-mitigation significance
	Medium-high negative (130)	Low-medium negative (30)

Impact 2.2: Loss of critical biodiversity areas	
Phase of expansion: Construction Phase	
Nature of impact	Clearing will result in the loss of 1.65 ha of degraded fynbos vegetation.
Cumulative impact	Reduction of overall critically endangered Algoa Sandstone Fynbos.
Indirect impacts	Loss of natural habitat for various animal species. Loss of plant SCC.
Residual impacts	Permanent loss of natural vegetation. Up to 6.78 ha will be permanently lost of which 1.65 ha is sensitive fynbos.

Classification of impact	Before mitigating	After mitigating	Consequence of Impact
Duration of impact	5	5	Clearing will result in the permanent loss of 6.78 ha of natural vegetation.
Extent of impact	5	3	All the vegetation within the construction footprint will be removed or mowed short.
Intensity of impact	5	2	Ecological processes will be altered.
Severity	**15**	**10**	**Duration + extent + intensity**
Probability of impact occurring	5	3	Impact will occur on commencement of construction.
Frequency	5	2	
Incidence	**10**	**5**	**Frequency + Probability**
Degree of reversibility	Low negative		Some of the impacts can be reversed.
Irreplaceability	High		Vegetation will be permanently lost.
Mitigations	Mitigatory potential		Recommended mitigations
	Medium		- Biodiversity offsetting of the lost Algoa Sandstone Fynbos is proposed. - The existing pistol range must be decommissioned, all infrastructure removed, and the area rehabilitated. This should be considered as part of biodiversity offsetting.
Significance of impact **(Severity x Incidence)**	Pre-mitigation significance		Post-mitigation significance
	High negative (150)		Low-medium negative (50)

Impact 2.3: Loss of plant SCC	
Phase of expansion: Construction Phase	
Nature of impact	Clearing may result in the loss of identified and non-identified plant SCC.
Cumulative impact	Reduction in individual protected plant species numbers.
Indirect impacts	Loss in genetic variability within a specific protected plant species.
Residual impacts	Reduction in individual protected plant species numbers.

Classification of impact	Before mitigating	After mitigating	Consequence of Impact
Duration of impact	5	1	Removal of SCC will only occur during the initial stages of clearing.
Extent of impact	3	2	Only SCC on site will be removed.
Intensity of impact	5	2	Genetic viability will be permanently lost.
Severity	**13**	**5**	**Duration + extent + intensity**
Probability of impact occurring	5	2	Impact will occur on commencement of construction.
Frequency	5	1	
Incidence	**10**	**3**	**Frequency + Probability**
Degree of reversibility	Low negative		Impact can be reversed through mitigation.
Irreplaceability	High		Plant species will be permanently lost.
Mitigations	Mitigatory potential		Recommended mitigations
	Medium		- A vegetation Search & Rescue must be undertaken by a qualified botanist prior to commencement of vegetation clearing. - Permits must be obtained to remove any plant SCC identified for removal. - SCCs must be relocated to suitable areas outside the footprint of the site where vegetation clearance will not occur. - Relocate or replant as many SCC as possible into the immediate surrounding areas. - No plant harvesting by construction staff will be allowed.

Significance of impact **(Severity x Incidence)**	Pre-mitigation significance	Post-mitigation significance
	Medium-high negative (130)	Very-low negative (15)

Impact 2.4: Loss of animal SCC	
Phase of expansion: Construction Phase	
Nature of impact	Vegetation clearing may result in the loss of individual animal species numbers
Cumulative impact	Reduction in individual protected animal species numbers.
Indirect impacts	Loss in genetic variability within a specific protected species.
Residual impacts	Reduction in individual protected species numbers.

Classification of impact	Before mitigating	After mitigating	Consequence of Impact
Duration of impact	2	1	Impact will only occur during the initial stages of clearing.
Extent of impact	1	1	Animal SCC and other animals will be impacted.
Intensity of impact	4	2	Genetic viability will be permanently lost.
Severity	**7**	**4**	**Duration + extent + intensity**
Probability of impact occurring	4	1	Impact will occur on commencement of construction.
Frequency	1	1	
Incidence	**5**	**2**	**Frequency + Probability**
Degree of reversibility	Low negative		Impact can be reversed through mitigation.
Irreplaceability	High		Plant species will be permanently lost.
Mitigations	Mitigatory potential		Recommended mitigations
	Medium		- A faunal Search & Rescue (specifically for reptiles) must be undertaken by a qualified faunal specialist prior to commencement of vegetation clearing. - Permits must be obtained to remove any animal SCC identified for removal. - SCCs must be relocated to suitable areas outside the footprint of the site where vegetation clearance will not occur. - Relocate as many SCC as possible into the immediate surrounding areas. - The site must be checked every morning during clearing for any animals hiding in/on plant and other construction infrastructure. - All animals trapped must be released in the local vicinity. - No animal poaching must be allowed.
Significance of impact **(Severity x Incidence)**	Pre-mitigation significance		Post-mitigation significance
	Low negative (35)		Very-low negative (8)

Impact 2.5: Erosion	
Phase of expansion: Construction and operational Phases	
Nature of impact	Clearing of vegetation will result in an increased erosion potential.
Cumulative impact	Loss in vegetation
Indirect impacts	Loss of fertile topsoil
Residual impacts	Surface erosion of mostly topsoil.

Classification of impact	Before mitigating	After mitigating	Consequence of Impact
Duration of impact	5	1	Erosion will be increased in this area once all vegetation and plant species have been cleared.
Extent of impact	2	2	Erosion will take place within the study area as well as affecting surrounding areas.
Intensity of impact	4	2	Due to soil erosion, natural vegetation and plant species will be lost.
Severity	**11**	**5**	**Duration + extent + intensity**
Probability of impact occurring	4	2	Impact will occur after the clearing of land has taken place.
Frequency	2	2	
Incidence	**6**	**4**	**Frequency + Probability**
Degree of reversibility	Low negative		Impact can be reversed through mitigation.
Irreplaceability	High		Plant species will be permanently lost.
Mitigations	Mitigatory potential		Recommended mitigations
	Medium		- Proper stormwater infrastructures should be in place. To ensure low energy dissipation of stormwater during rain events.
Significance of impact **(Severity x Incidence)**	Pre-mitigation significance		Post-mitigation significance
	Low negative (66)		Very-low negative (20)

Impact 2.6 Spread of alien and invasive plant species	
Phase of expansion: Construction Phase	
Nature of impact	Loss of natural vegetation will increase the risk of alien plant species invasion.
Cumulative impact	Increase in regional spread of alien plants.
Indirect impacts	Spread of alien vegetation to surrounding areas.
Residual impacts	Decreased risk of alien vegetation occurrence.

Classification of impact	Before mitigating	After mitigating	Consequence of Impact
Duration of impact	5	5	Clearing will mostly occur in the first few months of construction.
Extent of impact	3	1	Only the construction footprint will be impacted.
Intensity of impact	5	1	Areas will be cleared of vegetation.
Severity	**13**	**7**	**Duration + extent + intensity**
Probability of impact occurring	5	1	Impact will occur throughout construction phase.
Frequency	4	4	
Incidence	**9**	**5**	**Frequency + Probability**
Degree of reversibility	Moderate negative		Impact can be managed throughout all phases.
Irreplaceability	Low		Partial loss of resource. Natural functions are not affected.
Mitigations	Mitigatory potential		Recommended mitigations
	Medium		- Develop and implement an Alien Vegetation Management Plan to mitigate the establishment and spread of undesirable alien plant species during construction and operations. - All visible alien plants must be removed prior to top-and subsoil removal. Removal must occur through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance with the NEMBA: Alien Invasive Species Regulations.
Significance of impact **(Severity x Incidence)**	Pre-mitigation significance		Post-mitigation significance
	Medium negative (91)		Low negative (35)

6. Conclusion

6.1. Assessment summary

The proposed expansion of the Port Elizabeth Rifle and Pistol Club (PERPC) will be located on Farm 8 portion 5 in Greenbushes, Port Elizabeth. The expansion will involve the decommissioning and rehabilitation of the 1.61 ha pistol range located on Portion 6 of Farm 8 and the development of a new series of ranges on 6.78 hectares of land adjacent to the existing rifle range. This 6.78 ha of land will then merge with the existing 2.84 ha (rifle range), to make up a new total footprint of 9.64 ha, which will be the new footprint of the PERPC. BlueLeaf Environmental (Pty) has been appointed by PERPC to provide terrestrial biodiversity, plant and animal species input into the proposed expansion of the existing rifle range within Port Elizabeth, Eastern Cape Province, as part of the BA for the proposed PERPC expansion development.

The site is currently covered by natural vegetation which is almost entirely made up of alien invasives species. The SANBI VegMap (2018) lists the proposed activity within 2 vegetation types, namely Algoa Sandstone Fynbos and Bethelsdorp Bontveld vegetation. The site visit confirmed the following vegetation observations:

1. A total amount of 6.78 ha of natural vegetation will be removed which consists largely of alien invasive species, mostly wattle species.
2. A large portion of land within the expansion site (78 %) has been transformed by past mining. Wattle woodlots dominate in this area with little to no shrubs and geophytes layer.
3. Some SCC (3 species) do occur in the eastern sections of this portion.
4. Illegal harvesting of wattle trees for firewood were observed.
5. Dominant trees consist of *Acacia mearnsii* (Black wattle) as well as some Eucalyptus species (gum trees) and pine trees.
6. The site falls within a CBA and ESA2. After the site visit is was confirmed that only 24 % (1.65 ha) is considered as CBA while the remainder is ESA2.
7. By merging the pistol and rifle range and rehabilitating the old pistol range will result in almost no loss in biodiversity on the farm portion.
8. The proposed land use (shooting range) aligns with the land management requirements of an ESA2.

Only 3 plant SCC were observed on site. Two of these species are already threatened while the third is near threatened. Various other non-SCC species that still require permits for removal were also observed. Permits must be obtained for all these species and removed to adjacent but similar habitats by a qualified botanist prior to commencement of any vegetation clearing.

No animal SCC were observed on site. Reptiles especially are expected to occur on site. Permits must be obtained for all these species and removed to adjacent but similar habitats by a qualified faunal specialist prior to commencement of any vegetation clearing.

6.2. Alternatives

No site alternatives or layout alternatives are proposed. The proposed development is NOT considered as fatally flawed provided that all mitigation measures provided in this report are implemented.

6.3. Site Ecological Importance

Vegetation:
Two vegetation sensitivities were identified. The largest portion of the study site are considered as low sensitive. Here historical surface mining and alien infestation (mostly wattle) has completely transformed the land. Vegetation is dominated by dense clusters of wattle trees with little to no shrubs and herbs.

A small portion of land consist of wattle woodlots interspersed with a grassy fynbos matrix considered remnants of the original Algoa Sandstone Fynbos vegetation. This is allocated a high sensitivity. Thre plant SCC were observed although more species may occur.

Animal species:
Habitats for animals are scarce so most species will not occur on site. This includes birds, moles and invertebrates. The entire site has a moderate sensitivity allocation. Reptiles should be common, and a Search and Rescue is proposed for them prior to commencement of clearing.

Biodiversity:
A small portion of land – aligning with the fynbos remnant mentioned earlier – has a high sensitivity allocation. This is due to the high sensitivity of Algo Sandstone Fynbos in the area. The remainder is considered as moderate sensitivity.

6.4. Cumulative impacts

In terms of Environmental Impact Assessment, Cumulative Impact is defined as:

"*Means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*".

The following cumulative impacts were identified:
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1. Loss of high biodiversity landscapes. This will result in the loss of 1.65 ha of high value biodiversity Algoa Sandstone Fynbos (or remnants reheroff). This can be offset by rehabilitating the existing pistol range.

6.5. Levels of acceptable change

The proposed development is considered as an acceptable change to the environment provided all proposed mitigations are implemented.

6.6. Levels to be avoided

The proposed development may result in the negative impact on both terrestrial biodiversity and plant and animal species numbers. Provided that all mitigation measures proposed in this report are implemented, these risks are considered as an acceptable change to the local environment.

6.7. Current impacts

The following impacts are currently occurring on site and will be reduced/altered through the proposed development:

- Large portions of land within the expansion site are considered as completely transformed and dominated by wattle woodlots. Illegal wood harvesting for firewood is taking place in these areas. Left unmitigated, it is likely that alien vegetation will continue to spread and over time completely displacing indigenous vegetation.

6.8. Mitigations

The following mitigations must be included into the final EMPr:

Legal compliance:
- All relevant plant and animal removal/relocation permits must be obtained from the competent authorities to remove any protected plant species.

Loss of natural vegetation:
- The construction footprint must be surveyed and demarcated prior to construction commencing. All contractors must be made aware of this demarcation.
- All areas outside the demarcated footprint will be considered as No-Go areas.
- No construction activities (temporary or permanent) will be allowed in these No-Go areas.
- Temporary infrastructure such as the site camp, laydown areas and storage areas must be placed in areas already transformed and within the construction footprint.

Loss of critical biodiversity areas:
- Biodiversity offsetting of the lost Algoa Sandstone Fynbos is proposed.
- The existing pistol range must be decommissioned, all infrastructure removed, and the area rehabilitated. This should be considered as part of biodiversity offsetting.

Loss of plant SCC:
- A vegetation Search & Rescue must be undertaken by a qualified botanist prior to commencement of vegetation clearing.
- Permits must be obtained to remove any plant SCC identified for removal.
- SCCs must be relocated to suitable areas outside the footprint of the site where vegetation clearance will not occur.
- Relocate or replant as many SCC as possible into the immediate surrounding areas.
- No plant harvesting by construction staff will be allowed.

Loss of animal SCC:

- A faunal Search & Rescue (specifically for reptiles) must be undertaken by a qualified faunal specialist prior to commencement of vegetation clearing.
- Permits must be obtained to remove any animal SCC identified for removal.
- SCCs must be relocated to suitable areas outside the footprint of the site where vegetation clearance will not occur.
- Relocate as many SCC as possible into the immediate surrounding areas.
- The site must be checked every morning during clearing for any animals hiding in/on plant and other construction infrastructure.
- All animals trapped must be released in the local vicinity.
- No animal poaching must be allowed.

Erosion:

- Proper stormwater infrastructures should be in place. To ensure low energy dissipation of stormwater during rain events.

Spread of alien and invasive plant species:

- Develop and implement an Alien Vegetation Management Plan to mitigate the establishment and spread of undesirable alien plant species during construction and operations.
- All visible alien plants must be removed prior to top-and subsoil removal. Removal must occur through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance with the NEMBA: Alien Invasive Species Regulations.

6.9. General rehabilitation measures

The following general rehabilitation measures are recommended for inclusion into the EMPr:

Vegetation Search & Rescue

- Except to the extent necessary for the carrying out of the construction works, flora shall not be removed, damaged, or disturbed, nor shall any vegetation be planted.
- The search and rescue of rare, endemic, or endangered species, prior to site clearance must be carried out by a competent and qualified service provider. Translocation of these species shall take place strictly in accordance with the industry best practice.
- All plant species identified for re-vegetation purposes, must be relocated prior to clearing of the vegetation to a suitable holding site in the immediate vicinity.
- All animal species identified for relocation purposes, must be relocated prior to clearing of the vegetation to a suitable site in the immediate vicinity.

6.10. Specialist opinion

The proposed development is NOT considered to be Fatally Flawed and no components of the proposed project have been identified as flawed. No site or layout alternatives are proposed.

The ecological impacts of all aspects for the proposed new development were assessed and considered to be acceptable, provided that all mitigation measures provided in this report are implemented.

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8. Appendix A – List of all plant species

FAMILY	GENUS	SPECIES	COMMON NAME	RED DATA LIST SPECIES	OBSERVED ON SITE
	Sensitive species 448			VU	No
	Sensitive species 570			EN	No
	Sensitive species 588			VU	No
	Sensitive species 654			VU	No
	Sensitive species 657			EN	Yes
	Sensitive species 670			VU	No
	Sensitive species 991			CR	No
	Sensitive species 1252			VU	No
	Sensitive species 1268			CR	No
Acanthaceae	*Justicia*	orchioides	Ribbokbos	VU	No
Aizoacaeae	Corpuscularia	lehmannii	Ice-plant	CR	No
	Carpobrotus	*edulis*	Sourfig	LC	Yes
	Bergeranthus	addoensis	Bergeranthus	NT	No
	Erepsia	aristate	Eastern Spoonfig	EN	No
Amaryllidaceae	Cyrtanthus	obliquus	Knysna lily	PNCO	No
	Apodolirion	macowanii	Apodolirion	VU	No
	Haemanthus	sanguineus	April fool	PNCO	No
Apocynaceae	Microloma	tenuifolium	Kannetjie	PNCO	No
Asphodelaceae	*Bulbine*	*abyssinicia*	Bulbine	PNCO	Yes
	Aloe	*micracantha*	Wateraalwyn	PNCO	Yes
	Bulbine	*nascissifolia*	Strapped leaved bulbine	PNCO	Yes
Asteraceae	*Cirsium*	*vulgare*	Schottish thisle	AIS 1b	Yes
	Achyranthemum	*affine*	Plains chafflower	DD	Yes
	Ricinus	*communis*	Castor oil plant	AIS 2	Yes
	Euryops	*ericifolia*	Euryops	EN	Yes
	Metalasia	*muricata*	White bristle bush	LC	Yes
	Helichrysum	*teretifolium*	Needle Everlasting	LC	Yes
	Metalasia	*muricata*	Blombos	LC	Yes
Ericaceae	Erica	cerinthoides	Fire Erica	PNCO	No
Fabaceae	*Tephrosia*	*capensis*	Tephrosia	LC	No
	Aspalathus	setacea	Eastern Cape gorse	LC	No
	Indigofera	denudata	Bear indigo	LC	No
	Lotononis	acuminata		VU	No
	Acacia	*mearnsii*	Black wattle	AIS	Yes
	Acacia	*cyclops*	rooikrans	AIS 2	Yes
	Acacia	mearnsii	Black wattle	Alien Invasive	No
Gentianaceae	Chironia	tetragona	Sticky Chironia	LC	Yes
Geraniaceae	Pelargonium	reniforme	Kidney-leaved pelargonium	NT	Yes
Hyacinthaceae	Drimia	capensis	Maerman	LC	Yes
Hypoxidaceae	Hypoxis	angustifolia	yellow stars	LC	No
Iridaceae	Bobartia	orientalis	biesie	PNCO	No

FAMILY	GENUS	SPECIES	COMMON NAME	RED DATA LIST SPECIES	OBSERVED ON SITE
Lobeliaceae	Lobelia	tomentosa	Woolly lobelia	LC	No
Malvaceae	Hermannia	flammea	Poprosie	LC	Yes
Montiniaceae	Montinia	caryophyllacea	perdebos	LC	No
Myricaceae	Morella	quercifolia	maagpynbossie	LC	No
Myrtaceae	*Eucalyptus*	*sp.*	Gum tree	AIS 2	Yes
Pinaceae	*Pinus*	*sp.*	Pine tree	AIS	Yes
Plantaginaceae	Plantago	lanceolata	Ribwort Plantain	LC	No
Poaceae	Cymbopogon	marginatus	Lemon grass	LC	No
	Cynodon	dactylon	Couch grass	LC	No
	Ehrharta	calycina	Pipe grass	LC	No
	Thamnochortus	cinereus	Silver thachreed	LC	No
	Themeda	triandra	Red grass	LC	Yes
	Digitaria	eriantha	Woolly finger grass	LC	Yes
	Eustachys	paspaloides	Fan grass	LC	Yes
Rutaceae	*Agathosma*	*ovata*	Kluitjieskraal	LC	Yes
	Agathosma	*capensis*	spicy buchu	LC	Yes
Verbenaceae	*Lantana*	*camara*	lantana	AIS	Yes

9. Appendix A – List of all animal species

Mammals:

Family	Species name	Common name	Red list classification
Bathyergidae	*Bathyergus suillus*	Cape Dune Mole-rat	Least Concern
Bathyergidae	*Cryptomys hottentotus*	Southern African Mole-rat	Least Concern
Bathyergidae	*Georychus capensis*	Cape Mole-rat	Least Concern
Bovidae	*Antidorcas marsupialis*	Springbok	Least Concern
Bovidae	*Philantomba monticola*	Blue Duiker	Vulnerable
Bovidae	*Raphicerus melanotis*	Cape Grysbok	Least Concern
Bovidae	*Tragelaphus scriptus*	Bushbuck	Least Concern
Bovidae	*Tragelaphus strepsiceros*	Greater Kudu	Least Concern
Canidae	*Canis mesomelas*	Black-backed Jackal	Least Concern
Canidae	*Lycaon pictus*	African wild dog	Endangered
Canidae	*Otocyon megalotis*	Bat-eared Fox	Least Concern
Cercopithecidae	*Chlorocebus pygerythrus*	Vervet Monkey	Least Concern
Cercopithecidae	*Papio ursinus*	Chacma Baboon	Least Concern
Equidae	*Equus zebra zebra*	Cape Mountain Zebra	Least Concern
Felidae	*Caracal caracal*	Caracal	Least Concern
Felidae	*Felis silvestris*	Wildcat	Least Concern
Felidae	*Panthera pardus*	Leopard	Vulnerable
Gliridae	*Graphiurus (Graphiurus) murinus*	Forest African Dormouse	Least Concern
Herpestidae	*Cynictis penicillata*	Yellow Mongoose	Least Concern
Herpestidae	*Herpestes pulverulentus*	Cape Gray Mongoose	Least Concern
Herpestidae	*Suricata suricatta*	Meerkat	Least Concern
Leporidae	*Lepus saxatilis*	Scrub Hare	Least Concern
Muridae	*Aethomys namaquensis*	Namaqua Rock Mouse	Least Concern
Muridae	*Desmodillus auricularis*	Cape Short-tailed Gerbil	Least Concern
Muridae	*Gerbilliscus afra*	Cape Gerbil	Least Concern
Muridae	*Grammomys dolichurus*	Common Grammomys	Least Concern
Muridae	*Mastomys natalensis*	Natal Mastomys	Least Concern
Muridae	*Mus (Nannomys) minutoides*	Southern African Pygmy Mouse	Least Concern
Muridae	*Mus musculus musculus*		Least concern
Muridae	*Otomys irroratus*	Southern African Vlei Rat (Fynbos type)	Least Concern
Muridae	*Otomys saundersiae*	Saunders' Vlei Rat	Least Concern
Muridae	*Otomys unisulcatus*	Karoo Bush Rat	Least Concern
Muridae	*Rattus rattus*	Roof Rat	Least Concern
Muridae	*Rhabdomys pumilio*	Xeric Four-striped Grass Rat	Least Concern
Mustelidae	*Mellivora capensis*	Honey Badger	Least Concern
Nesomyidae	*Dendromus mesomelas*	Brants's African Climbing Mouse	Least Concern
Nesomyidae	*Saccostomus campestris*	Southern African Pouched Mouse	Least Concern
Nycteridae	*Nycteris thebaica*	Egyptian Slit-faced Bat	Least Concern
Procaviidae	*Procavia capensis*	Cape Rock Hyrax	Least Concern
Rhinolophidae	*Rhinolophus capensis*	Cape Horseshoe Bat	Least Concern
Rhinolophidae	*Rhinolophus clivosus*	Geoffroy's Horseshoe Bat	Least Concern
Soricidae	*Crocidura flavescens*	Greater Red Musk Shrew	Least Concern
Soricidae	*Myosorex varius*	Forest Shrew	Least Concern
Vespertilionidae	*Kerivoula lanosa*	Lesser Woolly Bat	Least Concern
Vespertilionidae	*Miniopterus natalensis*	Natal Long-fingered Bat	Least Concern
Vespertilionidae	*Neoromicia capensis*	Cape Serotine	Least Concern
Viverridae	*Genetta tigrina*	Cape Genet (Cape Large-spotted Genet)	Least Concern

Reptiles:

Family	Scientific name	Common name	Red list category
Agamidae	*Agama atra*	Southern Rock Agama	Least Concern
Chamaeleonidae	*Bradypodion taeniabronchum*	Elandsberg Dwarf Chameleon	Endangered
Chamaeleonidae	*Bradypodion ventrale*	Eastern Cape Dwarf Chameleon	Least Concern
Colubridae	*Dasypeltis scabra*	Rhombic Egg-eater	Least Concern
Colubridae	*Dispholidus typus typus*	Boomslang	Least Concern
Colubridae	*Philothamnus hoplogaster*	South Eastern Green Snake	Least Concern
Colubridae	*Philothamnus semivariegatus*	Spotted Bush Snake	Least Concern
Cordylidae	*Chamaesaura anguina anguina*	Cape Grass Lizard	Least Concern
Cordylidae	*Cordylus cordylus*	Cape Girdled Lizard	Least Concern
Cordylidae	*Pseudocordylus microlepidotus microlepidotus*	Cape Crag Lizard	Least Concern
Elapidae	*Hemachatus haemachatus*	Rinkhals	Least Concern
Elapidae	*Hydrophis platurus*	Yellow-bellied Sea Snake	Least Concern
Gekkonidae	*Hemidactylus mabouia*	Common Tropical House Gecko	Least Concern
Gekkonidae	*Pachydactylus maculatus*	Spotted Gecko	Least Concern
Gerrhosauridae	*Tetradactylus fitzsimonsi*	FitzSimons' Long-tailed Seps	Vulnerable
Lacertidae	*Nucras lalandii*	Delalande's Sandveld Lizard	Least Concern
Lacertidae	*Tropidosaura gularis*	Cape Mountain Lizard	Least Concern
Lamprophiidae	*Boaedon capensis*	Brown House Snake	Least Concern
Lamprophiidae	*Duberria lutrix lutrix*	South African Slug-eater	Least Concern
Lamprophiidae	*Homoroselaps lacteus*	Spotted Harlequin Snake	Least Concern
Lamprophiidae	*Lamprophis aurora*	Aurora House Snake	Least Concern
Lamprophiidae	*Lamprophis fuscus*	Yellow-bellied House Snake	Least Concern
Lamprophiidae	*Lycodonomorphus inornatus*	Olive House Snake	Least Concern
Lamprophiidae	*Lycodonomorphus rufulus*	Brown Water Snake	Least Concern
Lamprophiidae	*Lycophidion capense capense*	Cape Wolf Snake	Least Concern
Lamprophiidae	*Prosymna sundevallii*	Sundevall's Shovel-snout	Least Concern
Lamprophiidae	*Psammophis crucifer*	Cross-marked Grass Snake	Least Concern
Lamprophiidae	*Psammophis notostictus*	Karoo Sand Snake	Least Concern
Lamprophiidae	*Psammophylax rhombeatus*	Spotted Grass Snake	Least Concern
Lamprophiidae	*Pseudaspis cana*	Mole Snake	Least Concern
Leptotyphlopidae	*Leptotyphlops nigricans*	Black Thread Snake	Least Concern
Scincidae	*Acontias lineicauda*	Algoa Bay Legless Skink	Least Concern
Scincidae	*Acontias meleagris*	Cape Legless Skink	Least Concern
Scincidae	*Acontias orientalis*	Eastern Legless Skink	Least Concern
Scincidae	*Scelotes anguineus*	Algoa Dwarf Burrowing Skink	Least Concern
Scincidae	*Scelotes caffer*	Cape Dwarf Burrowing Skink	Least Concern
Scincidae	*Trachylepis capensis*	Cape Skink	Least Concern
Scincidae	*Trachylepis homalocephala*	Red-sided Skink	Least Concern
Scincidae	*Trachylepis varia sensu stricto*	Common Variable Skink	
Scincidae	*Trachylepis variegata*	Variegated Skink	Least Concern
Testudinidae	*Chersina angulata*	Angulate Tortoise	Least Concern
Testudinidae	*Homopus areolatus*	Parrot-beaked Tortoise	Least Concern
Testudinidae	*Stigmochelys pardalis*	Leopard Tortoise	Least Concern
Typhlopidae	*Rhinotyphlops lalandei*	Delalande's Beaked Blind Snake	Least Concern
Viperidae	*Bitis arietans arietans*	Puff Adder	Least Concern
Viperidae	*Causus rhombeatus*	Rhombic Night Adder	Least Concern

Amphibians:

Family	Scientific name	Common name	Red list category
Brevicepitidae	*Breviceps pentheri*	Eastern Cape Rain Frog	Least Concern
Bufonidae	*Sclerophrys capensis*	Raucous Toad	Least Concern
Bufonidae	*Sclerophrys pardalis*	Eastern Leopard Toad	Least Concern
Hyperoliidae	*Hyperolius marmoratus*	Painted Reed Frog	Least Concern
Hyperoliidae	*Hyperolius marmoratus verrucosus*	Painted Reed Frog (subsp. verrucosus)	Least Concern
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	Least Concern
Hyperoliidae	*Semnodactylus wealii*	Rattling Frog	Least Concern
Phrynobatrachidae	*Phrynobatrachus natalensis*	Snoring Puddle Frog	Least Concern
Pipidae	*Xenopus laevis*	Common Platanna	Least Concern
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	Least Concern
Pyxicephalidae	*Cacosternum boettgeri*	Common Caco	Least Concern
Pyxicephalidae	*Cacosternum nanum*	Bronze Caco	Least Concern
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bull Frog	Near Threatened
Pyxicephalidae	*Strongylopus fasciatus*	Striped Stream Frog	Least Concern
Pyxicephalidae	*Strongylopus grayii*	Clicking Stream Frog	Least Concern
Pyxicephalidae	*Tomopterna delalandii*	Cape Sand Frog	Least Concern

Butterflies:

Family	Scientific name	Common name	Red list category
GEOMETRIDAE	*Rhodometra sacraria*		Near threatened
GEOMETRIDAE	*Scopula internata*		Near threatened
HESPERIIDAE	*Afrogegenes letterstedti*	Brown dodger	Least Concern
HESPERIIDAE	*Afrogegenes ocra*	Yellow dodger	Least Concern
HESPERIIDAE	*Alenia sandaster*	Karoo dancer	Least Concern
HESPERIIDAE	*Eagris nottoana knysna*	Rufous-winged elfin	Least Concern
HESPERIIDAE	*Eretis umbra umbra*	Small-marbled elf	Least Concern
HESPERIIDAE	*Gomalia elma elma*	Green-marbled skipper	Least Concern
HESPERIIDAE	*Kedestes lepenula*	Chequered ranger	Least Concern
HESPERIIDAE	*Kedestes macomo*	Macomo ranger	Least Concern
HESPERIIDAE	*Metisella metis paris*	Gold-spotted sylph	Least Concern
HESPERIIDAE	*Metisella orientalis*	Eastern sylph	Least Concern
HESPERIIDAE	*Pelopidas thrax*	White-branded swift	Least Concern
HESPERIIDAE	*Sarangesa phidyle*	Small elfin	Least Concern
HESPERIIDAE	*Spialia asterodia*	Star sandman	Least Concern
HESPERIIDAE	*Spialia nanus*	Dwarf sandman	Least Concern
HESPERIIDAE	*Spialia spio*	Mountain sandman	Least Concern
HESPERIIDAE	*Tsitana uitenhaga*	Uitenhage sylph	Least Concern
LYCAENIDAE	*Aloeides almeida*	Plain russet	Least Concern
LYCAENIDAE	*Aloeides aranda*	Yellow russet	Least Concern
LYCAENIDAE	*Aloeides depicta*	Depicta russet	Least Concern
LYCAENIDAE	*Aloeides macmasteri*	Large plain russet	Least Concern
LYCAENIDAE	*Aloeides pallida pallida*	Giant russet	Least Concern
LYCAENIDAE	*Aloeides pierus*	Veined russet	Least Concern
LYCAENIDAE	*Aloeides quickelbergei*	Outeniqua russet	Least Concern
LYCAENIDAE	*Aloeides trimeni trimeni*	Brown russet	Least Concern

Family	Scientific name	Common name	Red list category
LYCAENIDAE	*Anthene amarah amarah*	Black-striped ciliate blue	Least Concern
LYCAENIDAE	*Anthene definita definita*	Steel-blue-ciliate blue	Least Concern
LYCAENIDAE	*Anthene livida livida*	Pale ciliate blue	Least Concern
LYCAENIDAE	*Anthene talboti*	Savanna ciliate blue	Least Concern
LYCAENIDAE	*Axiocerses croesus*	Dark-banded scarlet	Least Concern
LYCAENIDAE	*Cacyreus fracta fracta*	Water geranium bronze	Least Concern
LYCAENIDAE	*Cacyreus lingeus*	Bush bronze	Least Concern
LYCAENIDAE	*Cacyreus marshalli*	Common geranium bronze	Least Concern
LYCAENIDAE	*Capys alpheus alpheus*	Orange banded protea	Least Concern
LYCAENIDAE	*Chrysoritis beulah*	Gully opal	Least Concern
LYCAENIDAE	*Chrysoritis chrysaor*	Burnished opal	Least Concern
LYCAENIDAE	*Chrysoritis palmus margueritae*	Water opal	Least Concern
LYCAENIDAE	*Chrysoritis pyroeis hersaleki*	Sand-dune opal	Vulnerable
LYCAENIDAE	*Cupidopsis cissus cissus*	Meadow blue	Least Concern
LYCAENIDAE	*Deudorix antalus*	Brown playboy	Least Concern
LYCAENIDAE	*Durbaniella clarki jenniferae*	Little rocksitter	Least Concern
LYCAENIDAE	*Eicochrysops messapus messapus*	Cupreous ash blue	Least Concern
LYCAENIDAE	*Iolaus mimosae mimosae*	Mimosa sapphire	Least Concern
LYCAENIDAE	*Iolaus silas*	Southern sapphire	Least Concern
LYCAENIDAE	*Lachnocnema durbani*	Grassland woolly legs	Least Concern
LYCAENIDAE	*Lampides boeticus*	Pea blue	Least Concern
LYCAENIDAE	*Lepidochrysops asteris*	Brilliant giant cupid	Least Concern
LYCAENIDAE	*Lepidochrysops australis*	Southern giant cupid	Least Concern
LYCAENIDAE	*Lepidochrysops ketsi ketsi*	Ketsi giant cupid	Least Concern
LYCAENIDAE	*Lepidochrysops patricia*	Patrician giant cupid	Least Concern
LYCAENIDAE	*Lepidochrysops robertsoni*	Robertson's giant cupid	Least Concern
LYCAENIDAE	*Lepidochrysops variabilis*	Variable giant cupid	Least Concern
LYCAENIDAE	*Leptomyrina lara*	Cape black-eye	Least Concern
LYCAENIDAE	*Leptotes pirithous pirithous*	Common zebra blue	Least Concern
LYCAENIDAE	*Lycaena orus*	Western sorrel copper	Least Concern
LYCAENIDAE	*Myrina silenus ficedula*	Common fig tree blue	Least Concern
LYCAENIDAE	*Oraidium barberae*	Dwarf blue	Least Concern
LYCAENIDAE	*Phasis braueri*	Eastern arrowhead	Least Concern
LYCAENIDAE	*Tarucus thespis*	Vivid pierrot	Least Concern
LYCAENIDAE	*Trimenia argyroplaga argyroplaga*	Large silver-spotted copper	Least Concern
LYCAENIDAE	*Trimenia macmasteri macmasteri*	Karoo silver-spotted copper	Least Concern
LYCAENIDAE	*Zizeeria knysna knysna*	African grass blue	Least Concern
NYMPHALIDAE	*Acraea acara acara*	Acara acraea	Least Concern
NYMPHALIDAE	*Acraea horta*	Garden acraea	Least Concern
NYMPHALIDAE	*Acraea lygus*	Lygus acraea	Least Concern
NYMPHALIDAE	*Acraea neobule neobule*	Wandering donkey acraea	Least Concern
NYMPHALIDAE	*Aeropetes tulbaghia*	Table mountain beauty	Least Concern
NYMPHALIDAE	*Bicyclus safitza safitza*	Black-haired bush brown	Least Concern
NYMPHALIDAE	*Cassionympha cassius*	Rainforest dull brown	Least Concern
NYMPHALIDAE	*Catacroptera cloanthe cloanthe*	Pirate	Least Concern
NYMPHALIDAE	*Charaxes brutus natalensis*	White-barred charaxes	Least Concern
NYMPHALIDAE	*Charaxes jahlusa jahlusa*	Pearl-spotted charaxes	Least Concern
NYMPHALIDAE	*Charaxes pelias*	Protea charaxes	Least Concern
NYMPHALIDAE	*Charaxes varanes varanes*	Pearl charaxes	Least Concern

Family	Scientific name	Common name	Red list category
NYMPHALIDAE	*Danaus chrysippus orientis*	African plain tiger	Least Concern
NYMPHALIDAE	*Dira clytus eurina*	Cape autumn widow	Least Concern
NYMPHALIDAE	*Eurytela hiarbas angustata*	Pied piper	Least Concern
NYMPHALIDAE	*Hypolimnas misippus*	Common diadem	Least Concern
NYMPHALIDAE	*Junonia hierta cebrene*	Yellow pansy	Least Concern
NYMPHALIDAE	*Junonia orithya madagascariensis*	African blue pansy	Least Concern
NYMPHALIDAE	*Neptis saclava marpessa*	Spotted sailer	Least Concern
NYMPHALIDAE	*Pardopsis punctatissima*	Polka dot	Least Concern
NYMPHALIDAE	*Precis archesia archesia*	Garden inspector	Least Concern
NYMPHALIDAE	*Precis octavia sesamus*	Southern gaudy commodore	Least Concern
NYMPHALIDAE	*Pseudonympha magus*	Silver-bottom brown	Least Concern
NYMPHALIDAE	*Stygionympha vigilans*	Western hillside brown	Least Concern
NYMPHALIDAE	*Telchinia rahira rahira*	Marsh telchinia	Least Concern
NYMPHALIDAE	*Vanessa cardui*	Painted lady	Least Concern
NYMPHALIDAE	*Vanessa hippomene hippomene*	Southern short-tailed admiral	Least Concern
PAPILIONIDAE	*Papilio dardanus cenea*	Mocker swallowtail	Least Concern
PAPILIONIDAE	*Papilio demodocus demodocus*	Citrus swallowtail	Least Concern
PAPILIONIDAE	*Papilio nireus lyaeus*	Narrow green-banded swallowtail	Least Concern
PIERIDAE	*Belenois creona severina*	African caper white	Least Concern
PIERIDAE	*Belenois gidica abyssinica*	African veined white	Least Concern
PIERIDAE	*Belenois zochalia zochalia*	Forest caper white	Least Concern
PIERIDAE	*Catopsilia florella*	African migrant	Least Concern
PIERIDAE	*Colias electo electo*	African clouded yellow	Least Concern
PIERIDAE	*Colotis antevippe gavisa*	Red tip	Least Concern
PIERIDAE	*Colotis euippe omphale*	Southern round-winged orange tip	Least Concern
PIERIDAE	*Colotis evagore antigone*	Small orange tip	Least Concern
PIERIDAE	*Dixeia charina charina*	African ant-heap white	Least Concern
PIERIDAE	*Dixeia pigea*	Small ant-heap white	Least Concern
PIERIDAE	*Eronia cleodora*	Vine-leaf vagrant	Least Concern
PIERIDAE	*Eurema brigitta brigitta*	Broad-bordered grass yellow	Least Concern
PIERIDAE	*Mylothris agathina agathina*	Eastern dotted border	Least Concern
PIERIDAE	*Nepheronia buquetii buquetii*	Buquet's vagrant	Least Concern
PIERIDAE	*Pinacopteryx eriphia eriphia*	Zebra white	Least Concern
PIERIDAE	*Pontia helice helice*	Southern meadow white	Least Concern
PIERIDAE	*Teracolus eris eris*	Banded gold tip	Least Concern

Scorpions:

Family	Scientific name	Common name	Red list category
HORMURIDAE	*Opisthacanthus capensis*		
HORMURIDAE	*Opisthacanthus diremptus*		

Spiders:

Family	Scientific name	Common name
Aranaeidae	Nephila fenestrata	Black legged golden orb-web spider
Lycosidae	FAMILY Lycosidae	Wolf spiders
Salticidae	Heliophanus sp.	jumping spiders
Theraphosidae	FAMILY Theraphosidae	Unidentified Theraphosidae
Theraphosidae	Harpactira tigrina	

Draft Aquatic Biodiversity Compliance Statement

Expansion of the Port Elizabeth Pistol and Rifle Club (PERPC), Port Elizabeth, Eastern Cape Province

Prepared for:

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Port Elizabeth Rifle and Pistol Club (PERPC)
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Date submitted: 24 January 2024

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Table of Contents

1. Declaration of independence

I, Roy de Kock as duly authorized representative of BlueLeaf Environmental (Pty) Ltd, hereby confirm my independence (as well as that of BlueLeaf) as a specialist and declare that neither I nor BlueLeaf have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which BlueLeaf was appointed as environmental assessment practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for worked performed, specifically in connection with the Aquatic Compliance Statement for the proposed expansion of the PERPC. I further declare that I am confident in the results of the studies undertaken and conclusions drawn because of it – as is described in this report.

Full Name: Roy de Kock

Title / Position: Ecologist
Qualification(s): BSc (Hons) Geology; MSc Botany; Candidate PhD Botany
Experience (years/ months): 17 years
Registration(s): SACNASP (400216/16)
Tel: +27 76 281 9660
Email: roy@blueleafenviro.co.za

2. Expertise of specialist

Roy has over 17 years' experience in environmental consulting and specialist services in the Eastern Cape. Various projects throughout South Africa as well as Africa at larges has also been undertaken. Projects include baseline studies, impact assessments and compliance auditing for various large-scale projects including numerous wind farms, roads (National and Provincial), and infrastructure development projects. BlueLeaf also offers a wide range of in-house specialties that aligns to the NEMA Regulations and its associated Specialist Themed Protocols including but not limited to Animal and Plant Species, Terrestrial and Aquatic Biodiversity, Agricultural and Soils and the Visual/Landscape environment. Other specialist fields include Plant and Animal Search and Rescue, Fauna and Flora permit applications, Venomous Animals Training Workshops, Water Use Licensing and General Authorization Applications.

Roy holds a BSc Honours in Geology (2008) and an MSc in Botany (2010) from the Nelson Mandela University in Port Elizabeth. He is currently busy with his PhD (Doctorate degree) in Botany and Soil Science.

Roy is a registered as a Professional Natural Scientist (Pri.Sci.Nat.) with SACNASP (Registration nr: 400216/16).

This study complies with the requirements as listed in the Gazetted protocols for an aquatic biodiversity assessment (GN. R 320 of 2020) and minimum report content requirements.

3. Introduction

BlueLeaf Environmental (Pty) Ltd has been appointed by the Port Elizabeth Rifle and pistol Club (PERPC) to provide aquatic biodiversity input into the proposed expansion of the existing rifle and pistol club on Farm 8 Portions 5 and 6 Greenbushes, Port Elizabeth in the Eastern Cape Province. (Figure 3.1).

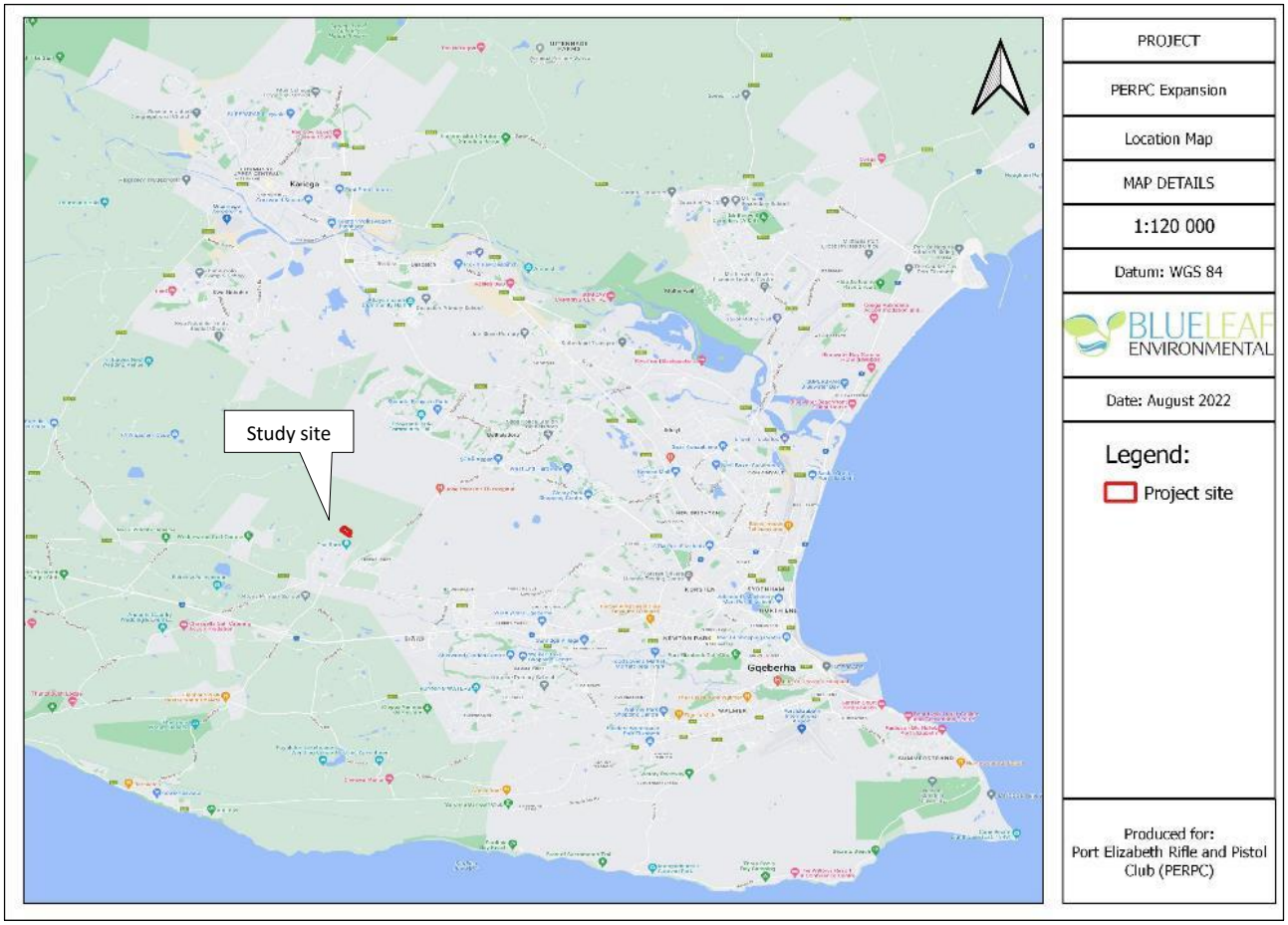

Figure 3.1: Location on the study site in Greenbushes, Port Elizabeth.

The aerial image of the proposed site (Figure 3.2 below) shows the existing rifle range of Farm 8, Portion 5 and existing pistol range on Farm 8, Portion 6 adjacent to the proposed expansion which will be located on Portion 5 of Farm 8. Figure 3.3 shows the proposed layout within the expansion area.

Current land use has been determined and the map in Figure 3.3 shows that almost the entire study site is covered by transformed natural vegetation dominated by wattle and gum woodlots. These areas have been transformed as a result of historical surface mining (probably for sand and gravel). Intact endemic vegetation can be found on a small portion (1.65 ha) within the proposed expansion site.

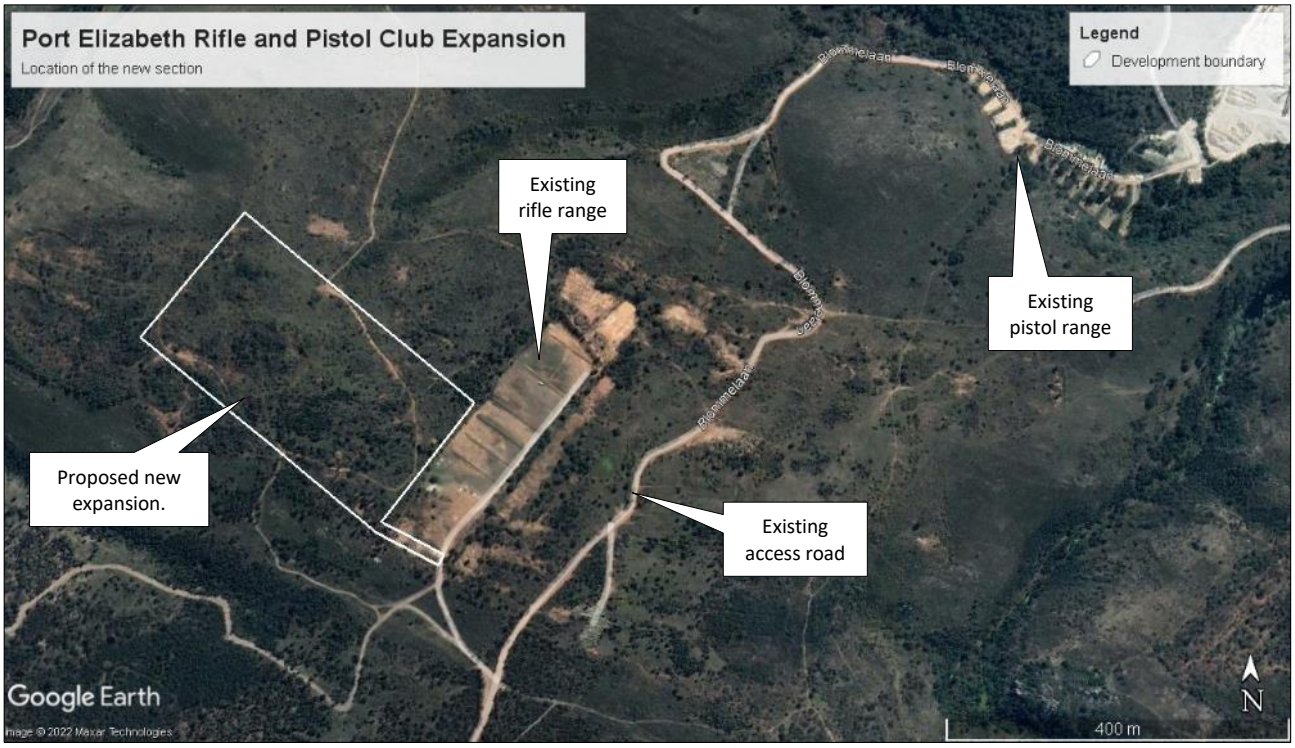

Figure 3.2: Aerial image of the farm area and study site

Figure 1.3: Proposed layout of the new expansion section

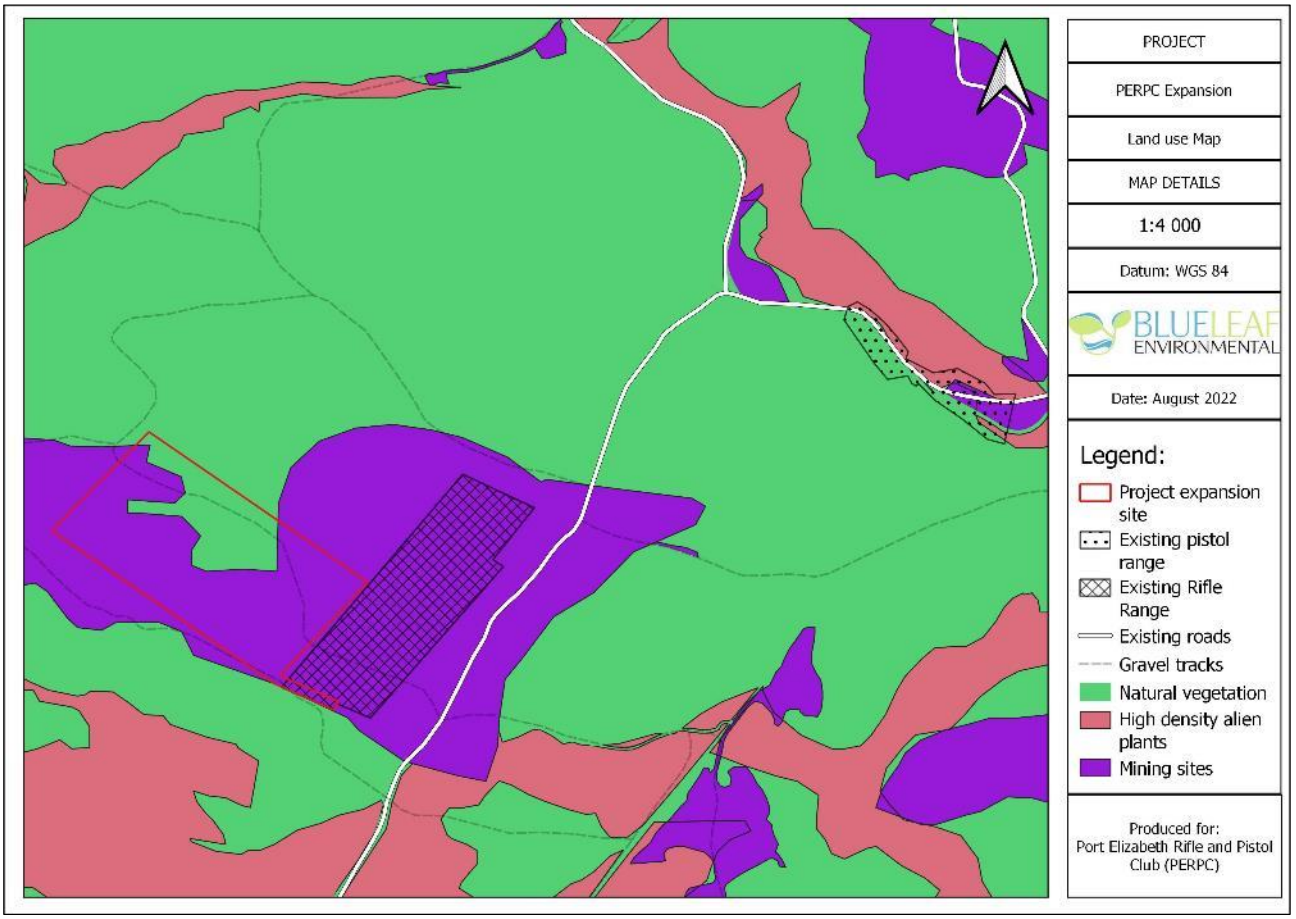

Figure 3.3: Land cover map of the study site and surrounding areas.

3.1 Project description

The proposed expansion of the Port Elizabeth Rifle and Pistol Club (PERPC) will be located on farm 8 portion 5 in Greenbushes, Port Elizabeth. The PERPC will be expanded onto the 6.8 hectares land adjacent to the existing rifle range, and will include the following infrastructure (Figure 1.3):

- 4 x (25m x 50m) ranges.
- 2 x (25m x 115m) ranges.
- 12 x (25m x 25m) ranges.
- 1 x (50m x 70m) space for offices and storage containers
- Approx. 900m of new road, 3m wide
- A firebreak surrounding the entire expansion.

The existing pistol range will be moved onto the new expansion and will not be maintained after development moves into operational phase. The old pistol range will be deconstructed and rehabilitated.

Table 1.1: Comparing land cover size before and after expansion for farm 8 portion 5 and 6

Land cover sizes before development(ha)			TOTAL (ha) Combined properties
Description	Farm 5/8 (rifle range)	Farm 6/8 (pistol range)	
Farm size total	119	341	460
Existing footprint	2.84	1.21	4.05
Additional footprint	6.8	-1.21	5.64
New total footprint	9.64	0	9.64

The total combined property size of farm 8 portions 5 and 6 is 460ha which is mostly natural vegetation. The current existing PERPC footprint of portions 5 and 6 combined is 4.05ha. The new expansion area of PERPC which will take place on farm 8 portion 5, is 6.8ha. This 6.8ha will be then merge with the existing 2.84ha (rifle range) to make up a new total footprint of 9.64ha, which will be the new footprint of the PERPC expansion development. The existing portion 6 (1.21ha) will be deconstructed and rehabilitated (old pistol range).

3.2 Methodology

This report has been drafted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(a) and (h) and 44 of NEMA (G.NR. 1150 of 2020) – Protocol for the specialist assessment and minimum report content requirements for environmental impacts on aquatic biodiversity.

A site sensitivity verification has been conducted (see Chapter 6) to confirm/dispute the current use of the land and aquatic sensitivity as identified by the Screening Tool. Motivation, with photographic evidence, was provided as part of the site sensitivity verification.

Current literature that was used to describe the site includes:

- Aquatic CBA classification according to the Nelson Mandela Bay Metropolitan Biodiversity Sector Plan (NMBM BP; 2014).
- Department of Water and Sanitation Desktop Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) Model (2014).
- Department of Water Affairs and Forestry: Level 2 River Ecoregional Classification System for South Africa, Lesotho, and Swaziland (2005).
- The National Freshwater Ecosystem Priority Areas (NFEPA) project (2011 - 2014).
- National Spatial Biodiversity Assessment (NSBA) – River Ecosystems (2004).
- SANBI National Vegetation Map (updated 2018).
- Screening Report – PERPC Expansion (Generated: 26/09/2022).

4. Desktop analysis

This section consists of a desktop analysis of the site based on available literature, plans andlegislation.

4.1 Vegetation

The national vegetation classification system called the SANBI VegMap (2018) identifies two (2) vegetation types within the PERPC expansion site namely **Algoa Sandstone Fynbos** and **Bethelsdorp Bontveld** (Figure 4.1).

Algoa Sandstone Fynbos occurs on coastal flats in the port Elizabeth area. Vegetation supports grassy shrubland (mainly graminoid fynbos) with grasses dominating in wet habitats. SANBI classifies this vegetation as **critically endangered** with about only 2% conserved in the Van Stadens Wildflower Reserve and some other private nature reserves. More than 50% has been transformed already through cultivation and urban sprawl of the Metro). Up to 80% of the proposed PERPC extension land area is covered by by this vegetation type.

Figure 4.1: SANBI VegMap of the study site

Bethelsdorp Bontveld forms part of the Albany Thicket biome and is found on steep slopes of deeply incised valleys. It consists of a mosaic of low thicket (2 - 3 m in height) consisting of bush clumps in a matrix of low, succulent-rich shrubland comprising of renosterveld and succulent karroid elements. Several of the tree and shrub species that make up the bush clumps (e.g. *Smelophyllum capense*) are shared with Baviaans Valley Thicket. SANBI classifies this vegetation as **least concerned.**

4.2 Topography

The regional landscape is low undulating hills and slopes, while the study area is found on a relative level platform elevating at 205 m.a.s.l. (meters above sealevel).

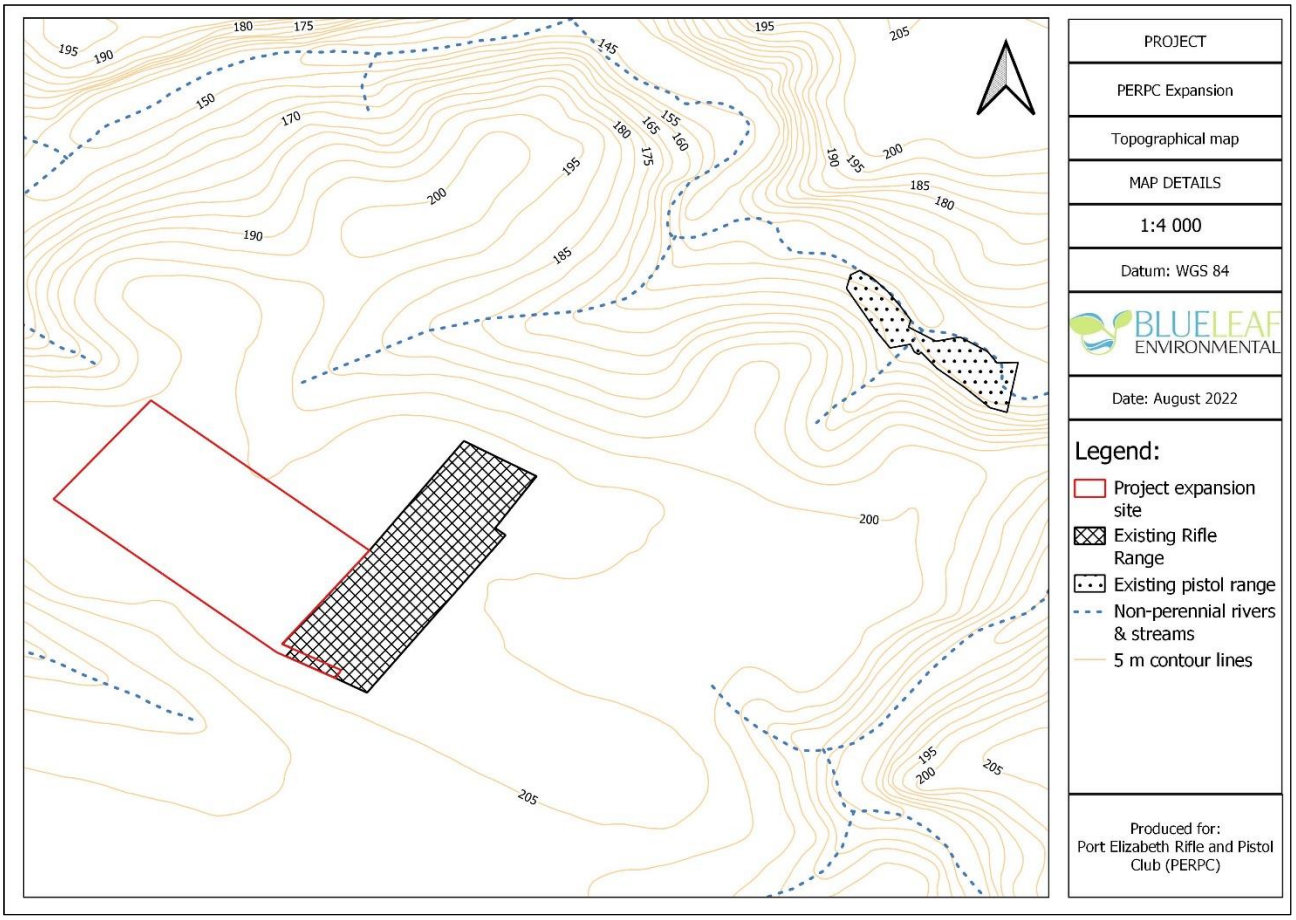

Figure 4.2: Topography of the study site and surrounding areas

4.3 Biodiversity

According to the NMBM BP (2014), the site is not located in any critical biodiversity area (CBA). It is however surrounded by various ESA1's (Figure 4.3).

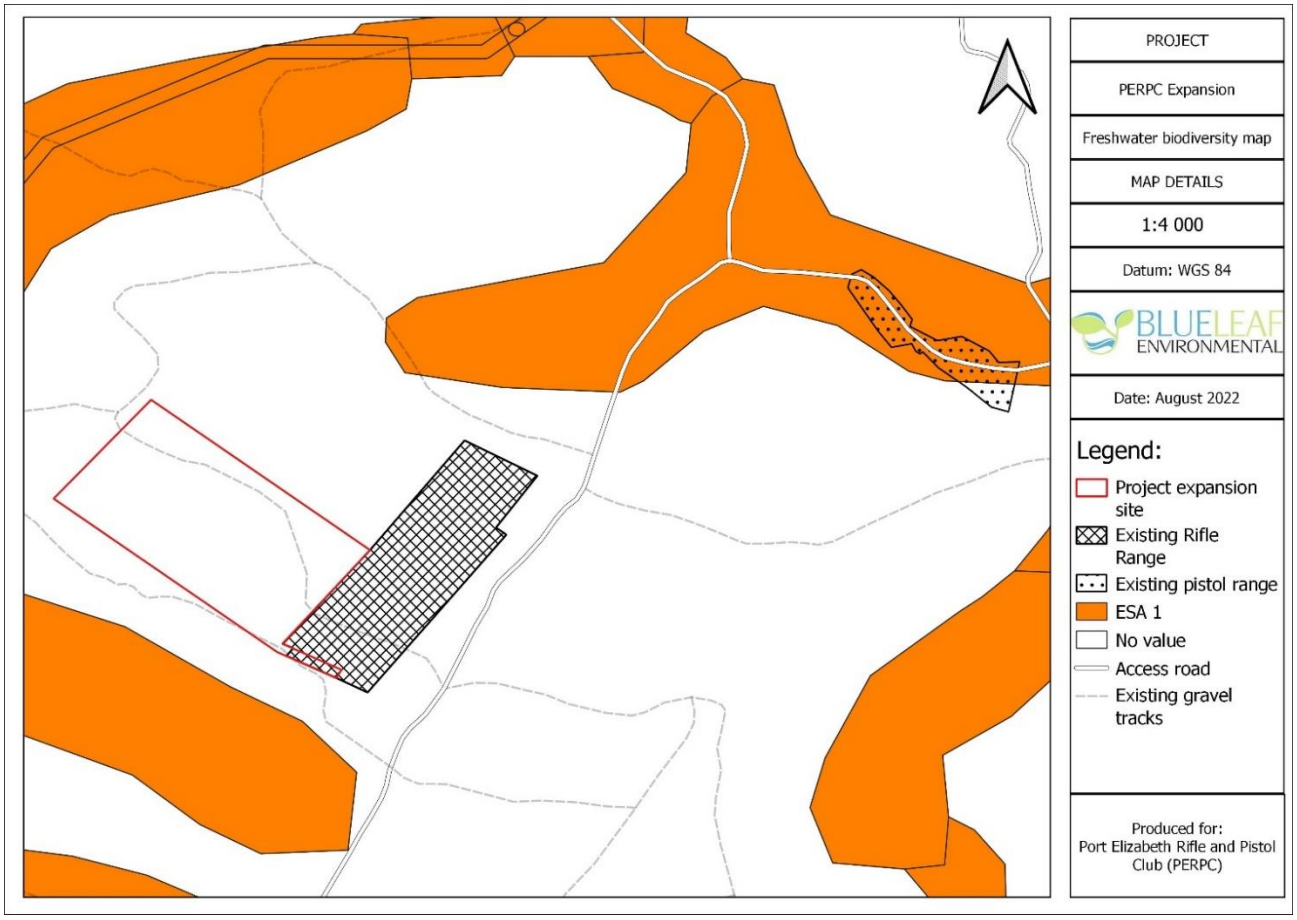

Figure 4.3: ECBCP – Freshwater Biodiversity for the study site and surrounding areas

4.4 Quaternary catchment and Water Management Area

The study area is located within Water Management Area 7 (Mzimvubu to Tsitsikamma) and quaternary catchment M10D.

4.5 Surface water

No wetlands occur on site or within 500 m of the expansion site boundary.

No rivers or streams are in or within 100 m of the study site. The nearest river, the Chatty River, is located 290 m to the west. This is a non-perennial river with a NFEPA classification of Class E – F (Not an acceptable classification). This river will not be impacted by the proposed expansion.

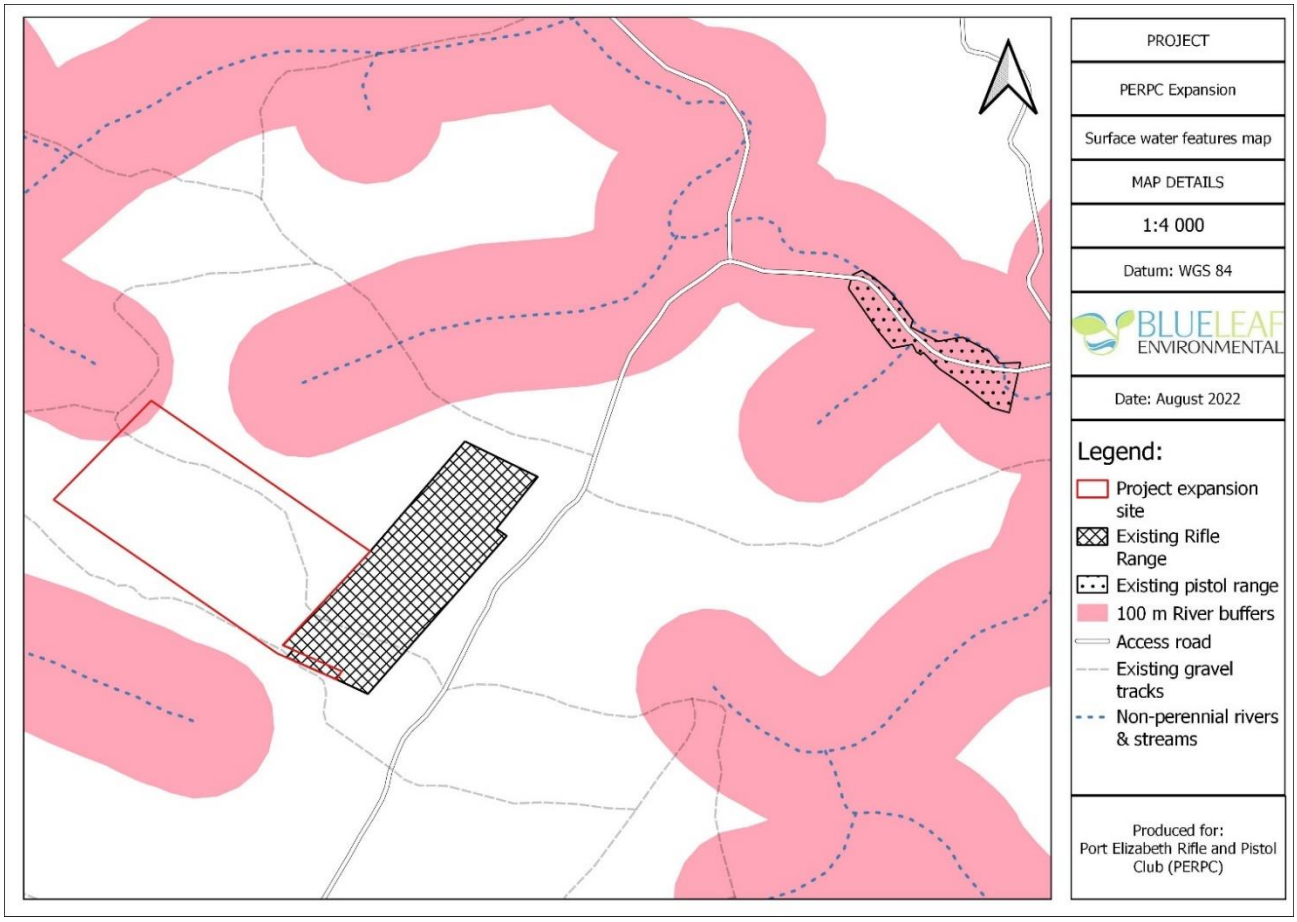

Figure 4.4: Freshwater rivers and wetlands in and surrounding the study area.

4.6 Ecoregions

South Africa is a geologically, geomorphologically, climatically and ecologically complex country, and this has resulted in a diverse range of ecosystems, including rivers. River ecoregional classification or typing allows the grouping of rivers according to similarities based on a top-down nested hierarchy. The principle of river typing is that rivers grouped together at a particular level of the typing hierarchy will be more like one another than rivers in other groups. Ecological regions are regions within which there is relative similarity in the mosaic of ecosystems and ecosystem components (biotic and abiotic, aquatic, and terrestrial).

According to the Department of Water and Sanitation Level 1 River Ecoregional Classification System (2005), the study area falls within Ecoregion 20.01: ***South Eastern Coastal Belt***.

This ecoregion has the following characteristics:

- Mean annual precipitation: Predominantly high.
- Coefficient of variation of annual precipitation: Low to very low.
- Drainage density: Medium to high.
- Stream frequency: Medium/high to very high.
- Slopes <5%: Predominantly <20%.
- Median annual simulated runoff: High.
- Mean annual temperature: Moderate.

4.7 Screening report

The screening report classifies the study site as **low sensitive** due to the absence of any sensitive freshwater features within the project site.

4.8 Site survey

The site survey showed the following:

Photos of the site	Description
	The proposed expansion site is mostly made up of transformed vegetation with a large component being alien invasive species interspersed with some individual endemics.
	A large component (over 80%) of the vegetation has been completely transformed. Soil profiles are also altered through historic surface mining.

	The sand mounds to the left of the image, shows that the site has historically been mined for sand. There has also been intensive illegal cutting down of trees for firewood use.

5. Site sensitivity verification

The following was found during the site assessment:

- No rivers or streams occur within 100m of the boundary of the study site.
- No wetlands occur within the study site.
- No wetland occur within 500 m of the study site boundary.
- Vegetation is typical Algoa Sandstone Fynbos but only a small, degraded extent remains within the study area. The remaining landscape is completely transformed and dominated by wattle woodlot.
- Up to 76% of the site was previously surface mined and the soils therefore completely altered.

Based on the above, it is the opinion of the specialist that the land is considered as **low sensitivity for aquatic biodiversity**. A full assessment will therefore NOT be required. Refer to Chapter 6 below for sitespecific management actions which must be included into the EMPr.

6. Conclusion

Based on the findings during the site assessment, the following management actions are recommended during all phases of the proposed Southwell mining development and must be included into the EMPr:

6.1. Management actions

A DWS Section 21 c&I application will not be required as the development is not located within 500 m of a wetland or 100 m of a river or stream.

8. Reference

DRIVER, A. et al. 2011. National Biodiversity Assessment 2011: an assessment of South Africa's biodiversity and ecosystems. Synthesis Report. SANBI and DEAT, Pretoria.

MUCINA, L. & RUTHERFORD, M.C. 2012. The vegetation of South Africa, Lesotho and Swaziland. SANBI, Pretoria.