PROJECT:

PROPOSED BLIKANA DAM BULK WATER SUPPLY SCHEME WITHIN THE JOE GQABI DISTRICT MUNICIPALITY, EASTERN CAPE

REPORT:

TERRESTRIAL BIODIVERSITY AND PLANT SPECIES ASSESSMENT REPORT

DATE:

April 2026

SPECIALIST:

Earthguard Consulting (Pty) Ltd

EARTHGUARD CONSULTING

CLIENT:

ABANTU ENVIRONMENTAL SERVICES

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EXECUTIVE SUMMARY

Earthguard Consulting (Pty) Ltd was appointed by Abantu Environmental Services to undertake a Terrestrial Biodiversity and Plant Species Assessment for the proposed Blikana Dam Bulk Water Supply Scheme (BWSS) within the Joe Gqabi District Municipality, Eastern Cape. The BWSS includes construction of a dam, abstraction works (C-B1/C-B2 and pick-up weir), a 7.5 ML/day water treatment works (WTW), command reservoirs (CR1–CR3), and associated rising and gravity mains across a rugged mountainous landscape near Blikana.

The National Web-Based Environmental Screening Tool identifies Very High terrestrial biodiversity theme sensitivity and Medium plant species theme sensitivity in the broader area, driven by overlap with biodiversity planning layers (including CBA/ESA features), the Eastern Cape Drakensberg Strategic Water Source Area (SWSA) and a FEPA sub-catchment. To verify site-scale sensitivity, a desktop assessment was undertaken using national and provincial biodiversity datasets (including VEGMAP, ECBCP layers, protected area and freshwater priority datasets), followed by field verification during 12–14 August 2025 (winter) and 31 January 2026 (summer).

Field verification confirmed a grassland-dominated montane landscape with rocky/cliff habitats and riparian/drainage features. Vegetation condition ranges from intact to disturbed, with localised erosion features and the presence of alien invasive/naturalised species (including *Agave* spp., *Opuntia* spp. and *Arundo donax*). No plant Species of Conservation Concern (SCC) were observed during the field surveys; however, the Screening Tool plant triggers include withheld sensitive species, therefore a precautionary approach is retained for high-risk microhabitats (riparian margins and rocky/cliff niches).

A Project Area of Influence (PAOI) was defined using a tiered approach comprising the mapped development footprint (Primary PAOI) and a 500 m nodal influence zone (Secondary PAOI) to account for likely indirect effects. Site Ecological Importance (SEI) was assessed using the guideline framework (CI and FI to derive BI, combined with RR to derive SEI), with sensitivity applied by receptor unit.

From a terrestrial biodiversity and vegetation perspective, the preferred WTW site is supported over Alternative 1. Although both sites are of low plant diversity and low ecological importance, the preferred site is located in a previously disturbed grazing/cultivation area, whereas Alternative 1 is associated with dongas and drainage lines that introduce additional erosion and disturbance constraints. The preferred WTW site is therefore considered the lower-risk option.

The main terrestrial biodiversity risks relate to localised vegetation loss and fragmentation within the footprint, disturbance of riparian/drainage receptors at crossing points, disturbance of rocky/cliff microhabitats at certain infrastructure nodes, erosion/sedimentation pathways on steep terrain, and the potential spread of alien invasive plants along disturbed corridors. Mitigation measures are provided to avoid and minimise disturbance where feasible through micro-siting, strict footprint discipline, riparian protection measures, erosion and sediment controls, progressive rehabilitation, and alien invasive plant management, supported by ECO monitoring and adaptive management.

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LIST OF ACRONYMS

AIPS	ALIEN INVASIVE PLANTS
BGIS	BIODIVERSITY GEOGRAPHIC INFORMATION SYSTEMS
CBA	CRITICAL BIODIVERSITY AREA
CREW	CUSTODIANS OF RARE AND ENDANGERED WILDFLOWERS
DEA	DEPARTMENT OF ENVIRONMENTAL AFFAIRS
DEDEAT	DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS AND TOURISM
DFFE	DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT
EA	ENVIRONMENTAL AUTHORISATION
EAP	ENVIRONMENTAL ASSESSMENT PRACTITIONER
ECBCP	EASTERN CAPE BIODIVERSITY CONSERVATION PLAN
ECO	ENVIRONMENTAL CONTROL OFFICER
EIA	ENVIRONMENTAL IMPACT ASSESSMENT
EMPR	ENVIRONMENTAL MANAGEMENT PROGRAMME
ESA	ECOLOGICAL SUPPORT AREA
FEPA	FRESHWATER ECOSYSTEM PRIORITY AREA
IAS	INVASIVE ALIEN SPECIES
IUCN	INTERNATIONAL UNION FOR CONSERVATION OF NATURE
NEWPOSA	NATIONAL ENVIRONMENTAL WEB PLANT OCCURRENCE SEARCH APP
NPAES	NATIONAL PROTECTED AREA EXPANSION STRATEGY
PAOI	PROJECT AREA OF INFLUENCE
PoO	PROBABILITY OF OCCURRENCE
SACNASP	SOUTH AFRICAN COUNCIL OF NATURAL SCIENTIFIC PROFESSIONS
SANBI	SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE
SCC	SPECIES OF CONSERVATION CONCERN
SEI	SITE ECOLOGICAL IMPORTANCE
SWSA	STRATEGIC WATER SOURCE AREA

SPECIALIST DETAILS

This report has been prepared in accordance with the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity, promulgated in terms of section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as published under Government Notice (GN) No. 320 of 20 March 2020. This report further aligns with the Species Environmental Assessment Guideline (GN 1150, Government Gazette 43855, 30 October 2020) for the plant species theme, including SCC probability-of-occurrence assessment, site verification and precautionary mitigation. It has been prepared independently of influence or prejudice by any parties.

The details of Specialist are as follows –

Mrs Zona Quvile

PhD Candidate (Environmental Science)- Rhodes University- Makanda

Main areas of specialisation

- Terrestrial ecology and biodiversity assessment with a focus on habitat sensitivity verification, ecological condition, and ecosystem functioning
- Field-based plant identification, including screening and identification of plant Species of Conservation Concern (SCC) and protected/regulated taxa (with supporting evidence capture and reporting)
- Application of the Terrestrial Biodiversity Protocol (GN 1150 of 2020) and the Species Environmental Assessment Guideline (v3.1) within EIA/BAR specialist studies
- Vegetation and habitat characterisation and interpretation using national datasets and frameworks (e.g., SANBI VEGMAP, land cover, threatened ecosystem information, provincial biodiversity plans)
- Assessment of ecological connectivity, fragmentation, and corridor functionality (including riparian corridors and grassland linkages), and interpretation of potential disruption by linear infrastructure
- GIS-supported terrestrial biodiversity outputs, including sensitivity mapping, buffers/no-go areas, and footprint/PAOI interpretation to support micro-siting
- Impact identification and assessment for construction and operation phases, including cumulative considerations, and development of EMPr-aligned mitigation, monitoring and rehabilitation recommendations
- Disturbance and pressure assessment (e.g., grazing, settlement influence, erosion, invasive species), and evaluation of receptor resilience and rehabilitation potential

Summary of expertise

Qualifications:	Med (Environmental Education), Rhodes University
	Biodiversity and Conservation Honours, Rhodes University
	Environmental Studies, Walter Sisulu University
	Tools for Wetland Assessment Course, Rhodes University
	Hydropedology and Wetland Course (WETREST; DSA)

The mini stream assessment scoring system (miniSASS); GroundTruth

Professional Affiliation: SACNASP: 115598

EAPASA: 2019/1039

Experience with fauna and flora assessments: 10 years

Professional Natural Scientist, South African Council for Natural Scientific Professions.

Member, Land Rehabilitation Society of Southern Africa

Employment

Jan 2020 – present	Earthguard Consulting, Director, Senior Environmental Scientist
Aug 2017 – Dec 2019	SRK Consulting (Pty) Ltd, Senior Environmental Scientist
Feb 2015 – Jul 2017	Sazi Environmental Consulting, Environmental Consultant
Sep 2014 & Aug 2015	Coastal and Environmental Services, Part-time Junior Environmental Consultant
Mar 2011 – Aug 2011	Walter Sisulu University, Research Assistant

DECLARATION OF INDEPENDENCE

I, **Zona Quvile**, in my capacity as specialist consultant, hereby declare that I –

- Act as an independent consultant;
- Have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the proposed activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code Of Conduct of the Council, as well as any other societies to which I am a member;
- Based on information provided to me by the project proponent and in addition to information obtained during this study, have presented the results and conclusion within the associated document to the best of my professional ability;
- Reserve the right to modify aspects about the present investigation should additional information become available through ongoing research and/or further work in this field; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

_____ 2026/04/07

1. INTRODUCTION

Earthguard Consulting (Pty) Ltd has been appointed by Abantu Environmental Services to conduct a terrestrial biodiversity and plant species assessment for the proposed Blikana Dam BWSS. This report follows on from the site verification screening report completed for the project area.

The National Web-Based Environmental Screening Tool rates the Terrestrial Biodiversity Theme for the broader area as Very High sensitivity ((e.g., CBA/ESA features, FEPA sub-catchment and the Eastern Cape Drakensberg SWSA) and the Plant Species Theme as Medium sensitivity, reflecting landscape-scale biodiversity priority layers and potential species triggers. This specialist assessment does not negate the Screening Tool sensitivity; rather, it verifies sensitivity at the footprint and PAOI scale and provides a receptor-based interpretation supported by field verification.

To address both themes efficiently and avoid duplication, the required terrestrial biodiversity and plant species specialist studies were undertaken and reported as a single integrated specialist report, incorporating: (i) a shared PAOI and field survey programme, (ii) habitat and vegetation verification, (iii) plant SCC screening and Probability of Occurrence assessment, (iv) Site Ecological Importance (SEI) evaluation by receptor unit, and (v) an integrated impact assessment with mitigation, monitoring and pre-construction verification measures applicable to both themes.

As per the assessment protocols identified in the DFFE Screening Report, a plant species and terrestrial biodiversity impact assessment were required. These assessments were conducted following the relevant protocols:

- Protocol for the Specialist Assessment and minimum report content requirements for environmental impacts on Terrestrial Biodiversity (GN 320, published 20 March 2020)
- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species (GN 1150 published on 30 October 2020).

The impact assessment methodology of the Species Impact Assessment Guidelines (SANBI 2020) was utilised to determine the impact of the proposed development on floral species.

The objectives of the assessment are to:

- Identify the Environmental Sensitivity of the site using desktop and online resources
- Describe the vegetation types on site, and identified sensitivities
- Determine the threat status and sensitivity of the vegetation type and plant species on site
- Describe the level of degradation of the vegetation and habitats on site
- Assess the impact of the proposed development on the vegetation, inclusive of ecological processes and plant Species of Conservation Concern (SCC), of the site
- Provide recommendations to mitigate the negative environmental impacts on the terrestrial biodiversity of the proposed development

1.1. PROJECT DESCRIPTION

The Joe Gqabi District Municipality (JGDM) is proposing the development of a bulk water supply using the eastern and western tributaries of the Blikana river Figure 1. The proposed development entails construction of a dam, reservoirs, abstraction points, water treatment works and pipelines to supply water within wards 2, 3, 4, 5 and 6 within Senqu Local Municipality (SLM). The proposed development entails:

- The Blikana river's eastern and western tributaries will supply water for this development
- A dam will be constructed upstream of abstraction point C-B1.

- The required water will be released from the dam and then abstracted from a pick-up weir located at C-B2.
- A water treatment works (WTW) (7.5Mℓ/d) will be constructed downstream of the abstraction point CB2, where water will be treated, stored and pumped to the various reservoirs

The reservoir supply areas and sizes are indicated below:

- Command Reservoir 1 (CR1) (9Mℓ) – Supplies water to Ward 2 and Ward 3 (Northern Portion)
- CR2 (2Mℓ) – Supplies water to Ward 4 (Western Side) & 5
- CR3 (2.5Mℓ) – Supplies water to Ward 4 (Eastern Side)

Pipelines for this option include the following:

- Rising main from WTW to CR1 & SR 1
- Rising main from WTW to Era village, 5164.42m (5.16km) long, 200mm-400mm steel pipe
- Rising main middle portion from Era village through Tlakaneng to Musong village, 2015.97m (2.02km) long, 150mm-400mm steel pipe
- Rising main at Musong tying to SR1, 2048.33m (2.05km) long, 150mm-400mm steel pipe
- Rising main from WTW to CR2, 200mm-400mm steel pipe
- Rising main from WTW to CR3, 200mm-400mm steel pipe
- Rising main from CR3 to Emqheyen village, 6731.99m (6.73km) long, 150mm-400mm steel pipe
- Rising main from WTW to SR2, 7179m long (7.18km), 150mm-400, steel pipe
- Rising main from WTW to SR2, 4064.89m (4.06km) long, 150mm-400mmsteel pipe
- Gravity main from Henge village to Magalagaleni village, 2005.86m (2.01km) long,
- Gravity main from Abstraction point 2, 1101.48m (1.10km) long, 50mm to 400mm pipes (Steel/PVC/HDPE)
- Gravity main from CR2 to Blikana village, 1665.73m (1.67km) long, 50mm to 400mm pipes (Steel/PVC/HDPE)
- Gravity main from CR3 to Ntubeni village, 2837.39m (2.84km) long, 50mm to 400mm pipes (Steel/PVC/HDPE)

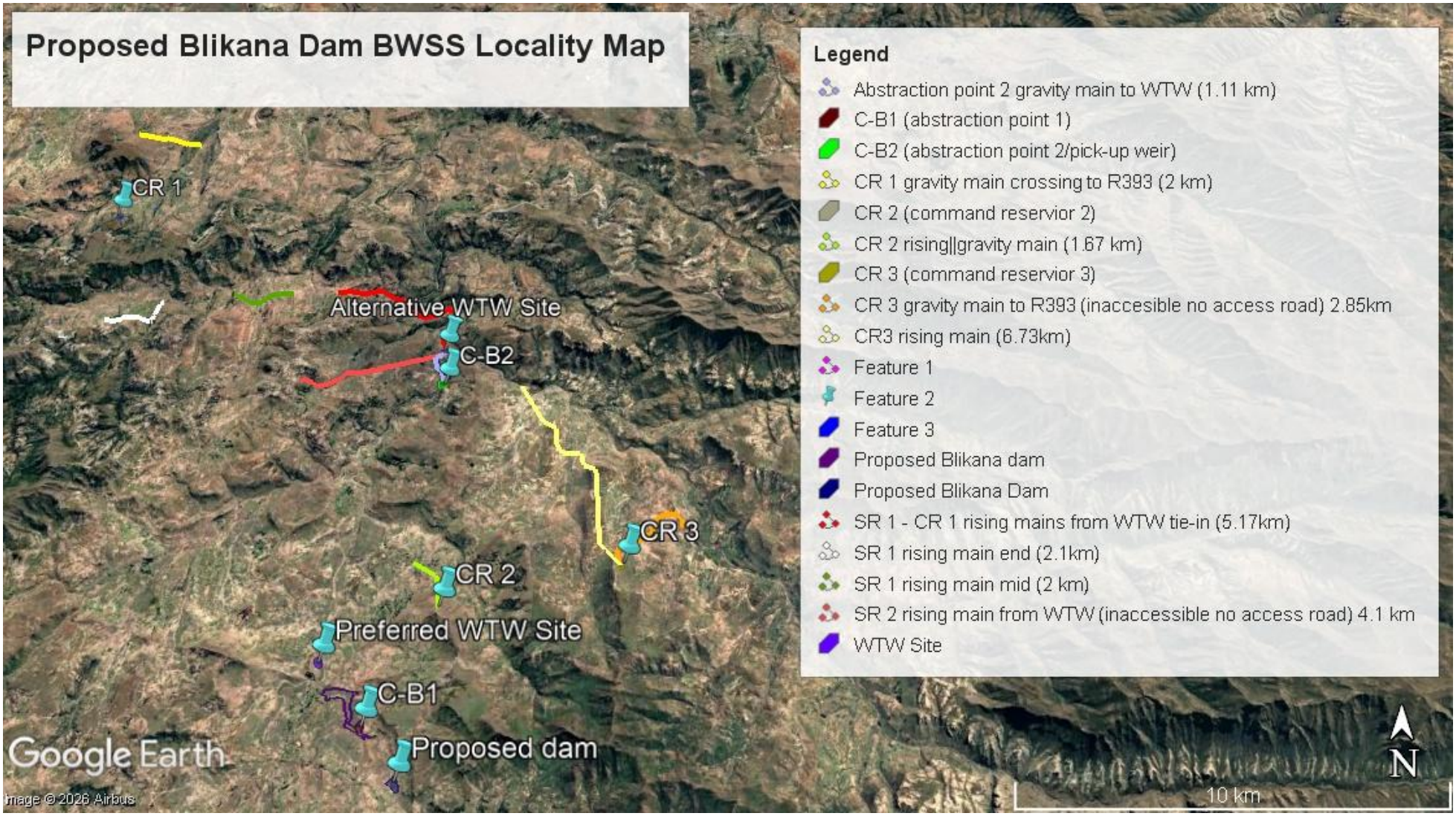


Figure 1: Blikana dam BWSS locality map.

1.2. LAND USE/COVER

The site consists mainly of natural grassland with some low shrubs scattered across it. Evidence of overgrazing is visible, with patches of bare soil, erosion, few trees and rocky outcrops present. Although the grassland is still recognisable, it shows signs of disturbance (Figure 2).

Figure 2: Rural settlements, alien invasive plant species, bare soil patches within the proposed project sites.

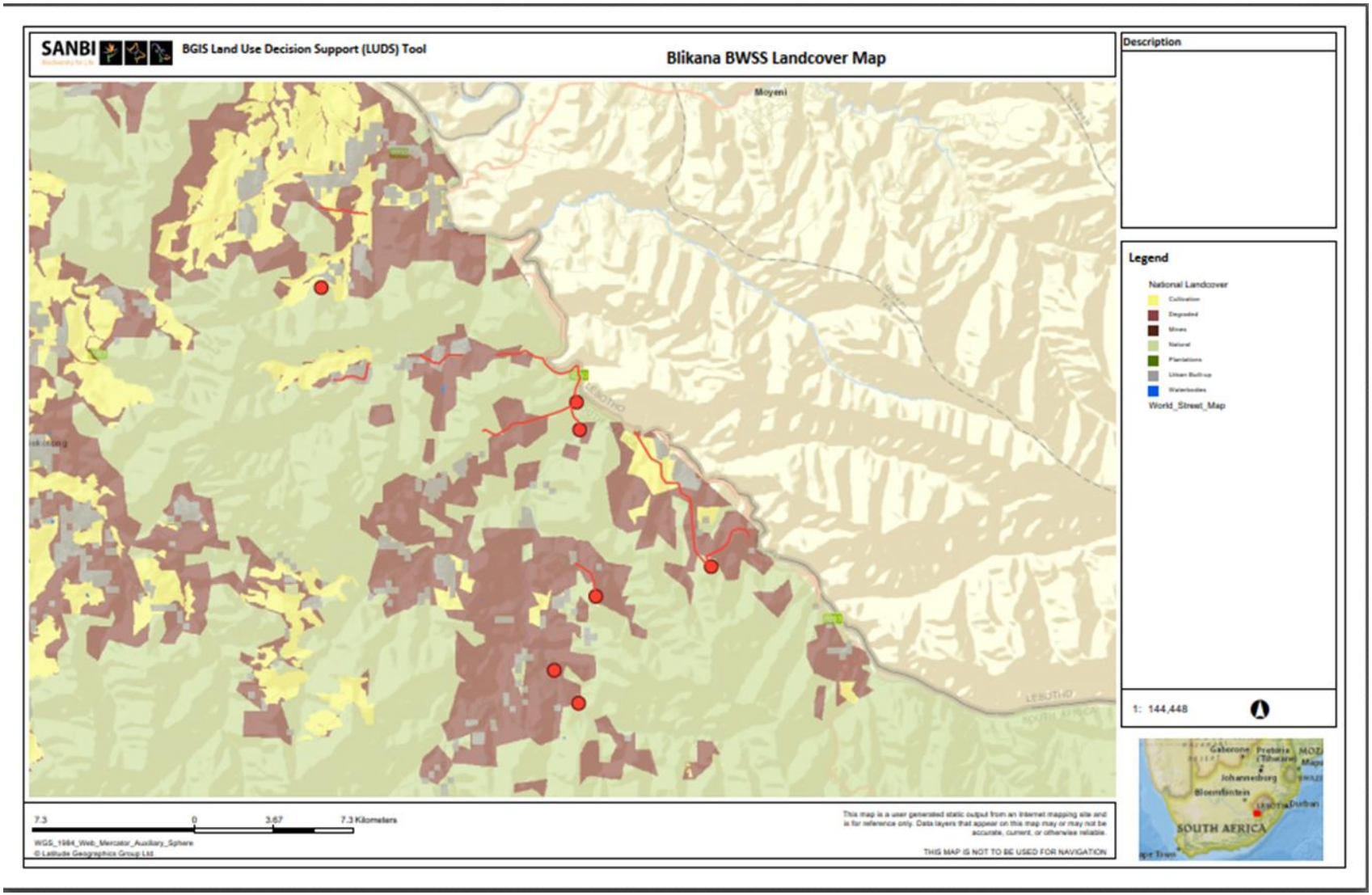


Figure 3: Landcover within and around the proposed development.

1.3. ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

The following assumptions and limitations are listed regarding the ecological assessment of the project site:

- Preferred footprint and data reliance: The assessment is based on the preferred development footprint and alignments supplied by the Client (KMZ/KML and project description). Any material changes to the final layout (pipeline routes, node locations, corridor width, construction camps/laydowns, access roads, borrow pits, spoil areas) may change habitat sensitivity, connectivity outcomes and the plant SCC risk profile, and may require re-validation.
- Linear corridor width assumption: Where linear infrastructure is represented as centre-lines, an assumed construction corridor width was used for footprint/PAOI interpretation and impact pathway assessment. If the final corridor width differs materially, the extent of habitat disturbance and fragmentation effects may change.
- Representative coverage in a large, dispersed project: The BWSS footprint is extensive and dispersed (multiple nodes connected by long linear infrastructure across rugged mountainous terrain). Surveys were designed to provide representative coverage of habitat units and sensitivity receptors. Not all portions of the corridor could be inspected at equal intensity, and some sections were assessed using habitat continuity interpretation and precautionary assumptions.
- Access and terrain constraints (cliffs/steep slopes): Some areas were not safely or practically accessible due to steep slopes, cliff faces, dense vegetation, and/or access limitations. These constraints can limit close inspection of microhabitats and may reduce detectability of plant SCC in specific niches. In such areas, the assessment relied on adjacent accessible vantage points, desktop interpretation, and precautionary sensitivity assignment.
- Multi-season surveys (winter and summer) but still not full phenology coverage: Field surveys were undertaken on 12–14 August 2025 (winter) and 31 January 2026 (summer). This provides improved seasonal coverage compared to a single survey and strengthens habitat condition and plant SCC detectability. However, certain plant SCC may only be detectable/identifiable during specific phenological windows (flowering/fruiting) outside these dates. Consequently, absence of detection does not confirm absence for all taxa.
- Habitat classification and mapping resolution: Habitat sensitivity and ecological connectivity interpretation relies on available national/provincial datasets (e.g., VEGMAP/land cover/CBAs) and satellite imagery, which may not capture fine-scale habitat mosaics typical of mountainous terrain and riparian zones. Field verification refines these datasets, but small patches of sensitive habitat may remain unmapped at a fine scale.
- Connectivity assessment is functional and pathway-based: Connectivity was assessed based on habitat continuity, riparian corridors, slope/ridge linkages, and barrier effects expected from linear infrastructure and access. Quantitative movement modelling for specific taxa was not undertaken. Connectivity conclusions are therefore functional and qualitative, supported by mapped habitat patterns and field verification.
- Dynamic ecological processes not measured directly: Processes such as fire regime, long-term grazing intensity, erosion dynamics and climate variability influence habitat condition and connectivity but were not measured directly through long-term datasets for the site. The assessment interprets these processes using field indicators and available desktop information.
- Construction method details and temporary works not fully confirmed: At the time of assessment, final method statements and the exact locations of temporary infrastructure (construction camps, laydown areas, contractor access routes, material stockpiles, spoil disposal areas) were not fully confirmed. These elements can drive additional habitat loss and fragmentation if not controlled and should be finalised through micro-siting and ECO oversight.

- Invasive alien plant dynamics: Invasive alien plant presence and spread risk can change rapidly following disturbance. The assessment provides a baseline view, but post-construction invasion risk depends on rehabilitation success, topsoil handling and ongoing maintenance.
- Uncertainty management: Where uncertainty remains (due to access or detectability limitations), the report applies a precautionary approach and recommends: (i) micro-siting to avoid sensitive habitat patches, (ii) strict footprint discipline, (iii) pre-construction walkdowns in high-sensitivity receptors (riparian zones, cliff-associated habitats), and (iv) adaptive management should additional SCC be detected during implementation.
- Sampling, by its nature, means that not all individuals are assessed and identified. Some species and taxa associated with the study area may have been missed during the assessment. It is, however, expected that most floral and faunal communities have been accurately assessed and considered. Relevant online sources and background information were further assessed to improve on the overall understanding of the study area's ecology;
- Compiling the list of species that could potentially occur on site is limited by the paucity of collection records for the area. The list of plant species that could potentially occur on site was therefore taken from a wider area and from literature sources that may include species that do not occur on site and may miss species that do occur on site. In order to compile a comprehensive site-specific list of the biota on site, studies would be required that would include different seasons, be undertaken over a number of years and include extensive sampling. Due to legislated time constraints for environmental authorisation processes, this is not possible;
- In addition, this report is based on currently available information and, as a result, is limited to the information provided;
- Sampling by its nature means that generally not all aspects of ecosystems can be assessed and identified;
- Information on the threat status of plants species was informed largely by the SANBI Threatened Species Online database, which was assumed to be up to date and accurate at the time of compiling this report. Any changes made after the compilation of the report are therefore not covered;
- The assessment of the potential occurrence was informed by the presence and condition of ideal habitat for each faunal species. The habitat condition / integrity was used as a surrogate indicator of the likelihood of a particular species being present;
- The assessment of impacts and recommendation of mitigation measures was informed by the site-specific ecological concerns arising from the vegetation field surveys and based on the assessor's working knowledge and experience with similar development projects;
- Additional information used to inform the assessment was limited to data and GIS coverage's available for the province and district municipality at the time of the assessment.
- The information regarding the proposed development received from the client and EAP is deemed accurate.

2. LEGAL FRAMEWORK

Environmental Impact Assessments (EIAs) are required in South Africa in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) and its' associated EIA Regulations (2014) as amended. Developments likely to have a major impact require scoping and EIA, and those likely to have a lesser impact require a Basic Assessment.

If natural vegetation will be affected by a proposed development, a vegetation survey should be commissioned as part of the environmental assessment process. If a subpopulation of a species of conservation concern is found to occur on the proposed development site, it would be one indicator that the proposed activity is likely to result in loss of biodiversity, bearing in mind that loss of subpopulations of these species will either increase their extinction risk or may in fact result in their extinction. The detection of a threatened species on a site during an environmental assessment should result in an Environmental Authorisation from the competent authority that avoids, mitigates, remedies or offsets loss of habitat for the species in question. The competent authority may also refuse authorisation for the proposed activity.

2.1. RELEVANT LEGISLATION

The proposed development will be subject to the requirements of various items of South African legislation (Table 1). These are described below.

Table 1. Legislation applicable to the project

Title of Environmental legislation, policy or guideline	Implications for the Proposed Development
Constitution of the Republic of South Africa (Act 108 of 1996)	- Obligation to prevent pollution and ecological degradation (Section 24);- Obligation to promote conservation; and- Obligation to secure ecologically sustainable development while promoting justifiable economic and social development.
National Environmental Management Act (NEMA) (Act 107 of 1998)	- Development must comply with NEMA environmental management principles;- Impacts on biodiversity must be avoided, minimised or remedied;- Duty of care applies to prevent environmental harm;- Integrated Environmental Management principles must guide decision-making.
EIA Regulations (2014, as amended)	- Requires assessment of impacts on terrestrial biodiversity and plant species;- Compliance with specialist protocols is mandatory.
Protocols for Specialist Assessment (GN 320 of 2020, as amended)	- Compliance statement must follow minimum reporting standards;- Site sensitivity verification required;- Plant SCC must be assessed and motivated.
National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004)	- Protection of threatened ecosystems;- Protection of Species of Conservation Concern;- Removal/relocation of protected species requires permits;- Alien invasive species must be controlled in accordance with regulations.
Threatened or Protected Species Regulations (TOPS), 2023	- Activities involving listed plant species require permits;- Handling, relocation, or rescue of SCC must comply with permit conditions.
Alien and Invasive Species Regulations, 2020	- Mandatory control and management of invasive plant species;- Duty to prevent spread of listed invasive species during construction.

Title of Environmental legislation, policy or guideline	Implications for the Proposed Development
National List of Threatened Ecosystems (GN 2747 of 2022)	- Development within Critically Endangered ecosystems triggers heightened biodiversity protection obligations;- Avoidance and mitigation hierarchy must be applied.
National Environmental Management: Protected Areas Act (Act 57 of 2003)	- Development may not compromise ecological integrity of protected areas;- Buffer zones around protected areas must be respected.
National Forests Act (Act 84 of 1998)	- Removal or disturbance of protected trees requires a forestry permit.
National Water Act (Act 36 of 1998)	- Protection of aquatic ecosystems connected to terrestrial biodiversity;- Activities affecting wetlands or watercourses require authorisation.
Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983)	- Requires control of invasive vegetation;- Promotes conservation of natural vegetation and soil resources.
Eastern Cape Biodiversity Conservation Plan (ECBCP, 2019)	- Identifies Critical Biodiversity Areas and Ecological Support Areas;- Guides land-use decisions to protect biodiversity priority areas.
National Biodiversity Assessment (NBA, 2018)	- Provides ecosystem threat status and conservation priorities;- Informs impact significance evaluation.

2.2. PROTOCOLS REGULATORY REQUIREMENTS

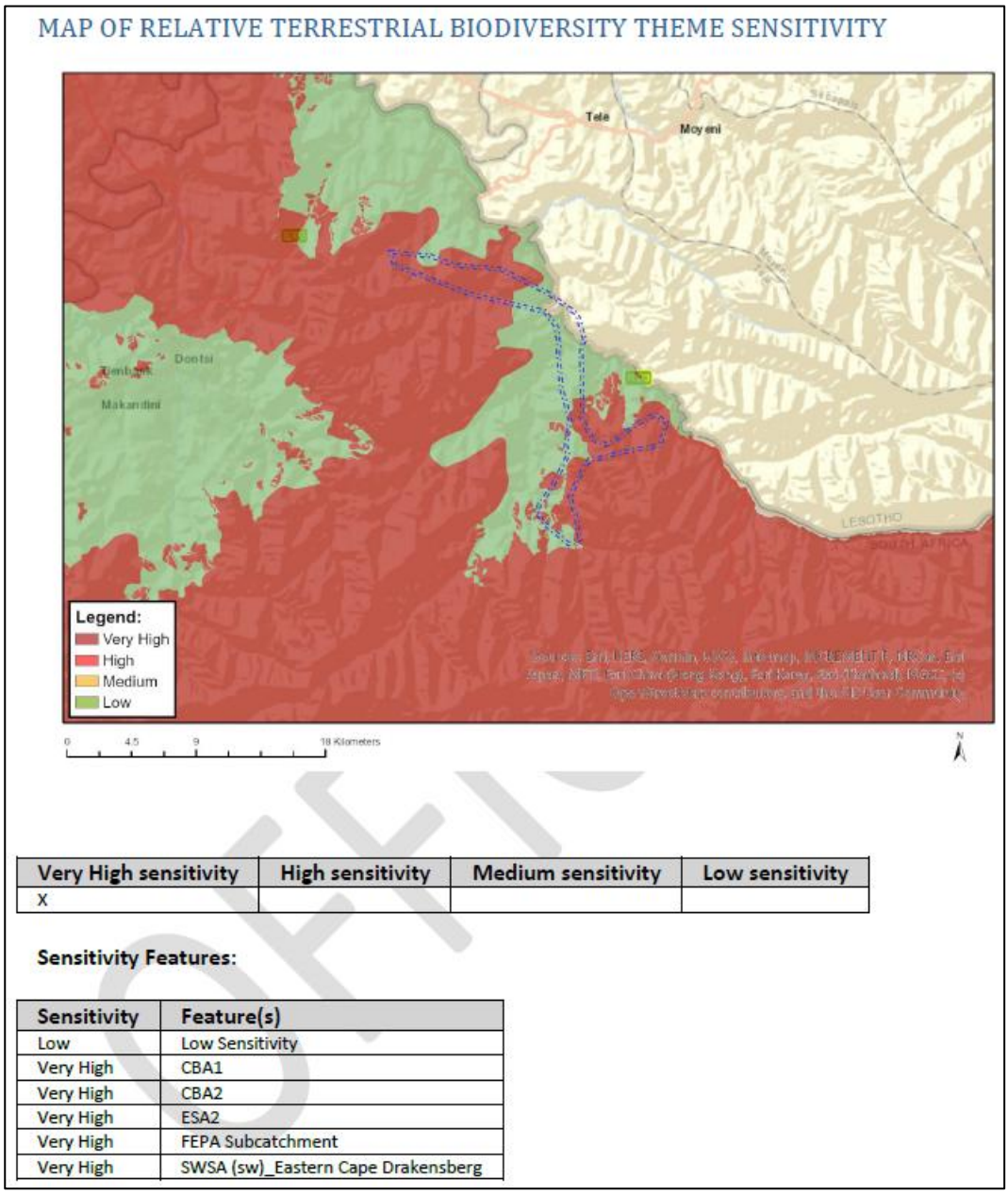
Based on the “Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation” (“the Protocols”) (Government Notice No. 320 as published in Government Gazette No. 43110 on 20 March 2020, which came into effect on 09 May 2020 and Government Notice No. 1150 as published in Government Gazette No. 43855 on 30 October 2020, which came into effect on the same date), it is hereby noted that the protocols are applicable to the proposed development. According to the Protocols, before commencing with a specialist assessment, the current use of the land and environmental sensitivity of the site under consideration identified by the screening tool must be confirmed by undertaking site sensitivity verification. A site sensitivity verification was conducted on 12 – 14 August 2025 and 31 January 2026 and a report was compiled, and it is included in the BAR.

The protocols specified in GN 320 (Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity) of the National Environmental Management Act (NEMA; Act No. 107 of 1998), assessment and reporting requirements for terrestrial biodiversity and plant species are associated with a level of environmental sensitivity identified by the national web-based environmental screening tool (screening tool).

The national web-based Environmental screening tool was queried about the Blikana River bulk water supply scheme.

2.3. IDENTIFIED SENSITIVITY THEME

The DFFE screening tool revealed the site to be under Very High sensitivity for the terrestrial biodiversity theme. The very high terrestrial biodiversity area sensitivity is because some components of the development are within CBA 1, CBA 2, ESA 2 and being within a FEPA Sub-catchment and within the Eastern Cape Drakensberg SWSA (surface water) (Figure 4).



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

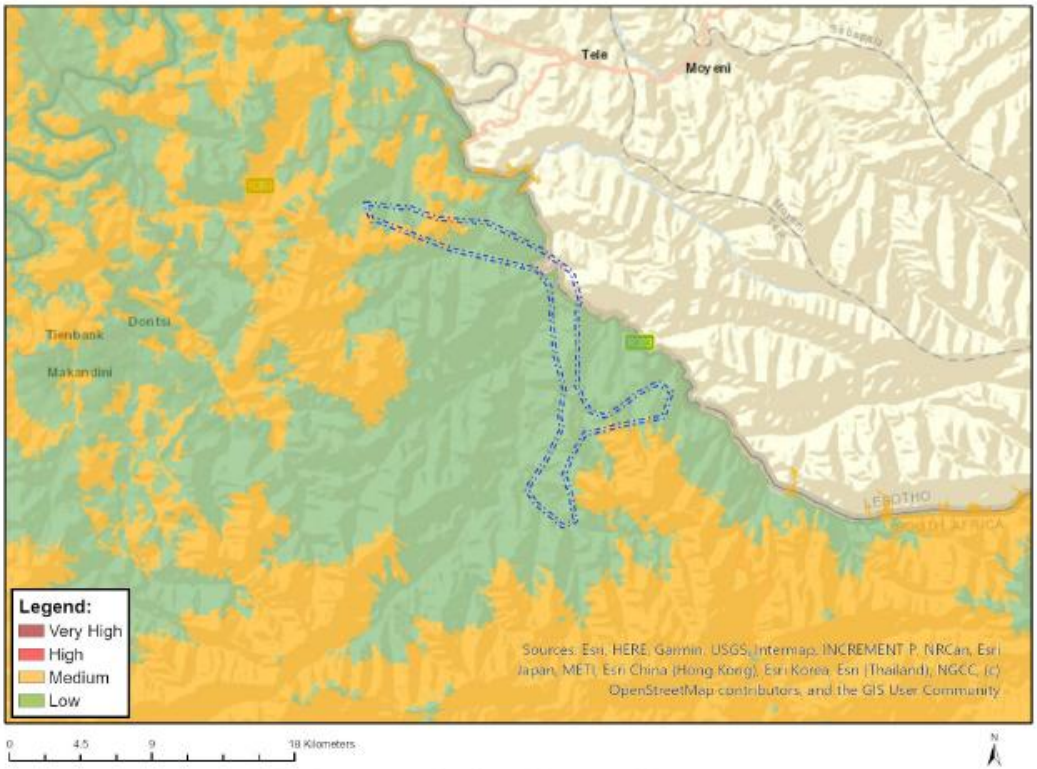
Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	CBA1
Very High	CBA2
Very High	ESA2
Very High	FEPA Subcatchment
Very High	SWSA (sw)_Eastern Cape Drakensberg

Figure 4: Screening Tool map of Terrestrial Biodiversity Theme sensitivity

The DFFE Screening Tool report for the area indicates a Medium Sensitivity for the Plant Species Theme due to presence of the *Pterygodium alticola and some* sensitive species. The spatial extent of the sensitive features, as extracted from the DFFE Screening Tool report output, is shown in Figure 5.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Pterygodium alticola
Medium	Sensitive species 441
Medium	Sensitive species 1248

Figure 5: Screening Tool map of the Plant Species Theme sensitivity

2.2. PROJECT ALTERNATIVES

No materially different alternative alignments or locations were identified for the majority of the Blikana Bulk Water Supply Scheme (BWSS) components, as the proposed dam, abstraction points, reservoirs and associated pipeline corridors are largely constrained by engineering feasibility, hydraulic requirements, topography and the need to service the intended supply areas in a mountainous landscape. These components are therefore considered to be fixed to a large extent by functional and technical requirements.

The only project component for which a locational alternative was considered is the proposed Water Treatment Works (WTW). Two WTW site options were assessed, namely the preferred WTW site and WTW Alternative 1 (Figure 5). From a terrestrial biodiversity and vegetation perspective, both sites are of low local plant diversity

and low ecological importance, and neither site is associated with particularly sensitive or intact vegetation of high conservation value. As such, there is no strong terrestrial biodiversity fatal flaw associated with either site.

The preferred WTW site is located within an area currently used as grazing fields, where there is evidence of previous cultivation and associated historical disturbance. The site is therefore already transformed to some degree and is characterised by relatively low vegetation diversity and limited ecological complexity. From a terrestrial biodiversity perspective, this reduces the significance of direct vegetation loss and habitat transformation associated with the proposed WTW footprint.

WTW Alternative 1 is located on an area characterised largely by bare patches of soil and rock substrate, and similarly supports low plant diversity and limited terrestrial ecological importance. In strictly vegetation and habitat terms, the alternative site is therefore also of relatively low sensitivity. However, Alternative 1 is associated with dongas and drainage line features, which increase the likelihood of erosion, sediment mobilisation and hydrological connectivity to surrounding landscape features if the site is disturbed. Although these drainage-linked features are more directly relevant from an aquatic perspective, they are also relevant to terrestrial habitat management because they represent unstable or erosion-prone areas and may function as local ecological conduits within the landscape.

On balance, while both WTW sites are regarded as being of low terrestrial biodiversity sensitivity, the preferred WTW site is considered the more suitable option from a terrestrial biodiversity and vegetation perspective because it is located in a previously disturbed grazing/cultivation area and is not associated with the same degree of local drainage feature constraint as Alternative 1. The preferred site is therefore supported as the preferred alternative, as it presents a slightly lower risk of erosion-linked habitat disturbance and a lower degree of local ecological complexity than the alternative site.

In summary, the WTW alternatives do not differ substantially in terms of plant diversity or ecological importance, as both occur in relatively disturbed, low-sensitivity habitat. However, the preferred WTW site is favoured because it is situated in an already disturbed grazing field with a history of cultivation, whereas Alternative 1 is associated with dongas and drainage lines that increase site sensitivity from a land stability and disturbance pathway perspective. The preferred WTW site is therefore recommended as the preferred option for the proposed development.

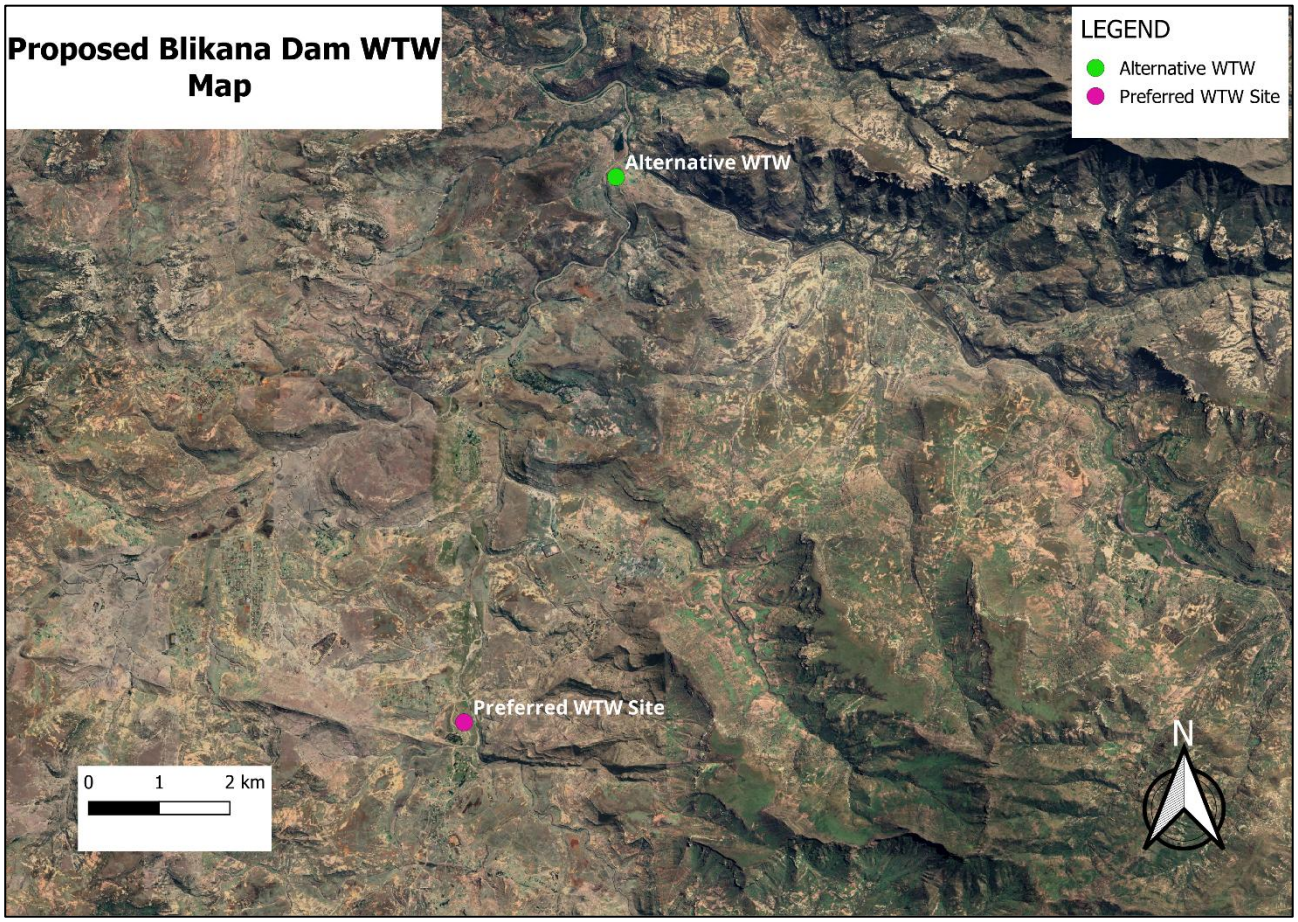


Figure 6: WTW site alternatives

2.3. TERMS OF REFERENCE

This specialist study is designed to meet the requirements of the Protocol for the Assessment and Reporting of Impacts on Terrestrial Biodiversity and Plant Species themes.
This site sensitivity assessment follows the requirements of The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020.

General information

- An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified on the screening tool as being of "**very high sensitivity**" for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment.
- An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being "**low sensitivity**" for terrestrial biodiversity must submit a Terrestrial Biodiversity Compliance Statement.
- However, where the information gathered from the site sensitivity verification differs from the designation of "very high" terrestrial biodiversity sensitivity on the screening tool and it is found to be of a "low" sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.
- Similarly, where the information gathered from the site sensitivity verification differs from that identified as having a "low" terrestrial biodiversity sensitivity on the screening tool, a Terrestrial Biodiversity Specialist Assessment must be conducted.
- If any part of the proposed development footprint falls within an area of "very high" sensitivity, the assessment and reporting requirements prescribed for the "very high" sensitivity apply to the entire footprint, excluding linear activities for which impacts on terrestrial biodiversity are temporary and the

land in the opinion of the terrestrial biodiversity specialist, based on the mitigation and remedial measures, can be returned to the current state within two years of the completion of the construction phase, in which case a compliance statement applies. Development footprint in the context of this protocol means the area on which the proposed development will take place and includes any area that will be disturbed.

Specific outcomes in terms of this report are outlined below:

- To state the indemnity and terms of use of this report as well as to provide the details of the specialists who prepared the report;
- To outline the legislative requirements that were considered for the assessment;
- Compile a desktop assessment with all relevant information as presented by SANBI's Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org) and the Environmental Geographical Information Systems (E-GIS) website (https://egis.environment.gov.za/). The desktop assessment aims to gain background information on the physical habitat and potential floral and faunal ecology associated with the study area;
- To define the Present Ecological State (PES) of the biodiversity of the study area;
- To determine and describe habitats, communities and the ecological state of the study area;
- To conduct a faunal and floral Species of Conservation Concern (SCC) assessment, including the potential of suitable habitat to occur within the study area for SCC;
- To identify and consider all sensitive landscapes, including rocky ridges, wetlands or any other special features such as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs);
- To determine the environmental impacts that the proposed development might have on the biodiversity associated with the study area; and
- To develop mitigation and management measures for all phases of the development.

2.4. PURPOSE OF THE BIODIVERSITY ASSESSMENT REPORT

The report content contains the minimum information and reporting requirements for a Terrestrial Biodiversity Impact Assessment and a Terrestrial Plant Species Specialist Assessment, as prescribed in Section 2 of Table 1 of the Protocol for the Terrestrial Biodiversity Theme (GN 320 of 20 March 2020), and is summarised in Table and Table below.

Table 2: Minimum information and report requirements for a terrestrial biodiversity impact assessment report.

Prescribed content of a Biodiversity Assessment Report	Reference in this report
(a) contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae.	Before Section 1
(b) a signed statement of independence by the specialist.	Before Section 1
(c) a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment	Section 3
(d) a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Section 3
(e) a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Section 1 and 3

Prescribed content of a Biodiversity Assessment Report	**Reference in this report**
(f) a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	Section 9.1.5
(g) additional environmental impacts expected from the proposed development;	Section 9
(h) any direct, indirect and cumulative impacts of the proposed development;	Section 9
(i) the degree to which impacts and risks can be mitigated;	Section 9
(j) the degree to which the impacts and risks can be reversed;	Section 9
(k) the degree to which the impacts and risks can cause loss of irreplaceable resources;	Section 9
(l) proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Section 9 and 10
(m) a motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	Not applicable
(n) a substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Section 11
(o) any conditions to which this statement is subjected.	Section 11
(p) The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	To be undertaken by EAP
(q) A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	Noted

Table 3: Summary of Terrestrial Plant Species Specialist Assessment Requirements.

Requirement	Section in this report
4.1. Medium sensitivity data represents suspected habitat for SCC based on occurrence records for these species collected prior to 2002 and/or is based on habitat suitability modelling.	2.2.2
4.2. The presence or likely presence of the SCC identified by the screening tool, must be confirmed through a site inspection by a specialist registered with the SACNASP in a field of practice relevant to the taxonomic group ("taxa") for which the assessment is being undertaken.	Section 3.3
4.3. The assessment must be undertaken within the study area.	Section 3.1
4.4. The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the *Species Environmental Assessment Guideline*[15].	Section 3
4.5. The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC within the site identified as "medium" sensitivity by the screening tool.	Section 6.3, 6.4, 6.5, 6.6
4.6. Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Plant Species Specialist Assessment must be submitted in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol.	N/A
4.7. Similarly, where no SCC are found on site during the investigation or if the presence is confirmed to be unlikely, a Terrestrial Plant Species Compliance Statement must be submitted.	No plant Species of Conservation Concern (SCC) were observed during the site investigation (August 2025 and January 2026), and the likelihood of SCC occurring within most of the footprint/PAOI is assessed as low. The plant species outcome is therefore documented within this integrated specialist report (Terrestrial Biodiversity and Plant Species), which provides the required evidence base, sensitivity verification and mitigation/monitoring measures.

3. METHODOLOGY

The terrestrial biodiversity assessment involved a desktop literature survey, as well as a site assessment that took place on 12 – 14 August 2025 and 31 January 2026. An observed plant species list was produced and annotated according to the relevant legislation. All Threatened or Protected Species were identified, as well as any Invasive Alien Species (IAS).

The approach used in this terrestrial biodiversity assessment, inclusive of terrestrial plant species, is as follows:

3.1. PROJECT AREA OF INFLUENCE

The Project Area of Influence is defined by the important ecosystem processes and functions that may be affected by the proposed development and its activities. The Species Environmental Assessment Guideline (2020) requires that the EAP and Specialists define the taxon-specific Project Area of Influence (PAOI) based on the spatial location of the project (footprint) and the potential extent of the impacts of the anticipated project activities.

For the terrestrial biodiversity and plant species themes, the Project Area of Influence (PAOI) was defined as the spatial extent within which direct and indirect impacts of the Blikana Water Supply Scheme (BWSS) on terrestrial habitats, ecological connectivity and potential plant SCC could reasonably occur. Given that the BWSS is a dispersed, linear-and-nodal scheme across rugged mountainous terrain, the PAOI was defined using a tiered, pathway-linked approach, rather than treating the entire broader landscape as uniformly affected.

Primary PAOI (direct footprint)

The Primary PAOI comprises the mapped BWSS development footprint, including the dam and abstraction works (C-B1/C-B2), WTW, command reservoirs (CR1–CR3), and the linear pipeline/rising and gravity main corridors and associated construction disturbance footprint (working areas and access where applicable). This is the zone within which direct habitat disturbance and loss may occur.

Secondary PAOI (localised zone of influence around nodes)

A Secondary PAOI was defined around the principal nodal infrastructure locations (dam/abstraction area, WTW/C-B2, and CR1–CR3) to represent the likely zone of indirect effects associated with construction activity and operational presence. For mapping purposes, a 500 m radius was applied around each nodal component (as shown in Figure 7). This radius is considered a realistic representation of the likely zone of influence in a mountainous setting and includes potential indirect pathways such as disturbance/edge effects, erosion and runoff mobilisation, invasive alien plant establishment along disturbed edges and access routes, and localised changes in habitat functionality and connectivity.

Receptor habitats explicitly included within the PAOI

In addition to the footprint and nodal influence zones, the PAOI explicitly includes habitat receptors that mediate biodiversity effects, namely:

- riparian corridors, rivers/streams and drainage lines intersecting or immediately adjacent to the footprint (important for habitat integrity and connectivity);
- rocky outcrops and cliff-associated habitats where present near infrastructure; and
- remaining natural/near-natural habitat patches relevant to ecological connectivity between nodes and along the linear corridor.

Survey coverage and defensibility

Field verification was undertaken on 12–14 August 2025 and 31 January 2026. Due to the large spatial extent of the scheme and rugged terrain, fieldwork focused on the infrastructure nodes and accessible sections of the linear footprint, including representative receptor habitats within the Primary PAOI and Secondary PAOI. The assessment therefore integrates: (i) site verification at representative nodes and receptor habitats, (ii)

desktop interpretation of habitat continuity and sensitivity layers, and (iii) a precautionary approach where access limited close inspection. This approach is appropriate for a dispersed mountainous scheme, provided that micro-siting, strict footprint discipline and pre-construction walkdowns are implemented as recommended in this report.

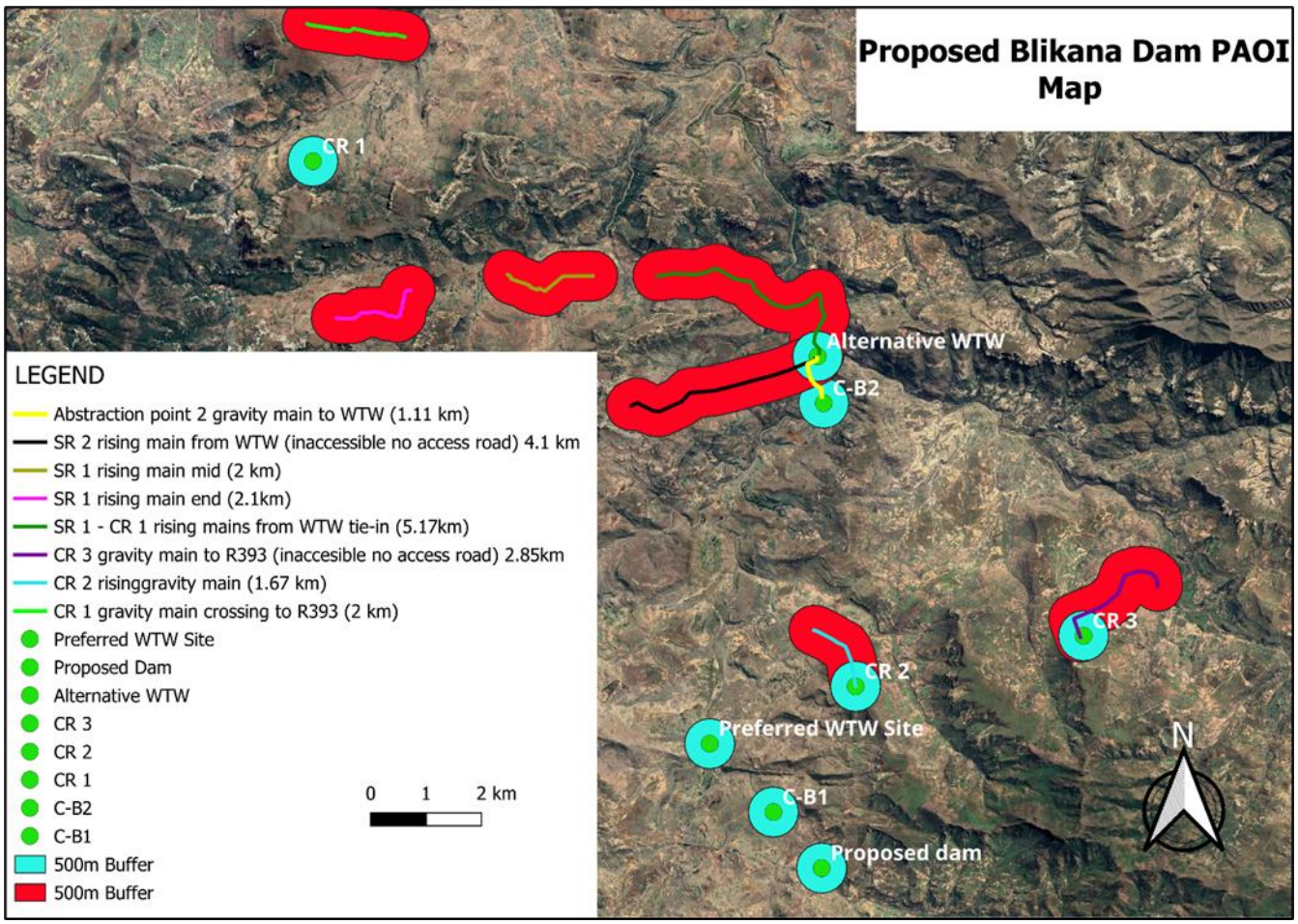


Figure 7: Project Area of Influence

3.2. DESKTOP ASSESSMENT

Maps and digital satellite images were generated prior to the field assessment to determine broad habitats, vegetation types and potentially sensitive sites. The biodiversity desktop assessment is not confined to the study area and includes the neighbouring and adjacent properties, and the sensitivity of surrounding areas is included on the respective maps. Relevant databases and documentation that were considered during the assessment of the study area included:

- 2010 National Protected Area Expansion Strategy (NPAES) (Government of South Africa. 2010; DEA & SANBI, 2009), including the below-listed vector datasets:
    - NPAES Focus Areas 2010: National Protected Areas Expansion Strategy: Focus areas for protected area expansion (South African National Parks (SanParks), 2010);
    - NPAES Formal: Polygons of formal protected national parks areas in South Africa (SANParks/SANBI, 2013); and
    - NPAES Protected Areas – Informal: Informal conservation areas in South Africa (SANParks/SANBI, 2012).
- The South African Protected Areas Database, Quarter 2 (SAPAD, 2021);
- Eastern Cape Biodiversity Conservation Plan (2019);

- The National Vegetation Map Project (VEGMAP), with the below vector dataset used for information on Biomes, Bioregions and Vegetation Type(s):
    - 2018 Final Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018a).
- The National List of Threatened Ecosystems 2011 (SANBI 2011; South Africa, 2011);
- From the National Biodiversity Assessment (NBA, 2018) Terrestrial Assessment project (Skowno et al., 2019):
    - 2018 Terrestrial ecosystem threat status and protection level - remaining extent (SANBI, 2018b); and
    - 2018 Terrestrial ecosystem threat status and protection level layer (SANBI, 2018c).
- The Important Bird and Biodiversity Areas (IBA) Programme and vector dataset (BirdLife South Africa, 2015; Marnewick et al., 2015a and 2015b), in conjunction with the South African Bird Atlas Project 2 (SABAP 2);
- The International Union for Conservation of Nature (IUCN);
- The National Screening Tool (accessed 2020); and
- From the 2017 Strategic Water Source Areas (SWSA) project:

2017 SWSA Surface water (Water Research Commission, 2017).

3.3. SITE ASSESSMENT / FIELD VERIFICATION

Site verification for the terrestrial biodiversity and plant species themes was undertaken during two field survey windows, namely 12–14 August 2025 (winter) and 31 January 2026 (summer). The use of two seasons strengthened the assessment by allowing verification of habitat condition and disturbance patterns under contrasting seasonal conditions, and improved confidence in the interpretation of vegetation structure, riparian condition and ecological connectivity across the project footprint and PAOI.

Seasonal timing has specific relevance to plant SCC detectability and habitat interpretation:

- The winter survey (August 2025) supported assessment of baseline habitat condition, grazing/disturbance patterns, erosion features and ecological connectivity. However, some plant SCC may be less detectable or not readily identifiable in winter due to limited flowering/fruiting.
- The summer survey (January 2026) improved detectability for many plant taxa and assisted with confirming vegetation vigour, riparian condition and microhabitat suitability. Summer conditions also enable clearer interpretation of drainage features and erosion risk pathways.

No plant SCC were observed during the winter or summer survey periods. Notwithstanding this, plant SCC detectability may still vary by phenological timing, localised microhabitats (e.g., rocky ledges, cliff-associated niches, riparian margins), and access constraints in rugged terrain. The assessment therefore applies a precautionary approach in higher-sensitivity receptors and recommends pre-construction micro-siting and walkdowns where appropriate.

3.3.1. FIELD VERIFICATION APPROACH

The BWSS comprises dispersed nodal infrastructure (dam/abstraction works, WTW and reservoirs) connected by extensive linear pipelines across rugged mountainous terrain. Field verification was therefore designed as a receptor- and pathway-based survey, focused on verifying terrestrial habitat sensitivity, ecological condition and connectivity within the Primary PAOI (footprint) and Secondary PAOI (500 m node influence zones).

The field approach included:

- Nodal infrastructure verification: targeted checks at or near the proposed dam/abstraction area (C-B1/C-B2), WTW site and reservoir sites (CR1–CR3) to confirm habitat condition, disturbance levels and sensitive receptor presence in areas of direct footprint disturbance.
- Linear corridor verification: representative verification along accessible portions of the pipeline corridors, focusing on habitat transitions, areas of higher naturalness, and potential connectivity pinch points (e.g., ridgelines, valleys, drainage crossings).
- Riparian and drainage features: targeted verification of rivers/streams and drainage lines intersecting or adjacent to the footprint/PAOI, to assess riparian condition, erosion risk, and the role of riparian corridors in ecological connectivity.
- Rocky outcrops/cliff-associated habitats: targeted verification of rocky habitats and cliff-associated zones near infrastructure where these features occur, recognising that these microhabitats can support specialised plant communities and influence habitat sensitivity.
- Plant SCC checks: field-based plant screening along accessible habitat units and microhabitats likely to support plant SCC, supported by photographic evidence of representative habitats and field notes.
- Disturbance gradients: recording of key pressures such as grazing intensity, settlement influence, existing access tracks, erosion features and invasive alien plants where present.

Where direct access was constrained by steep terrain or safety limitations (including cliff faces), verification relied on observations from adjacent accessible areas and desktop interpretation of habitat continuity and condition.

Figure 8: Drainage features: targeted verification

Figure 9: Cliff-associated habitats and rocky outcrops

Figure 10: Disturbance gradients: settlement influence, existing access tracks, erosion features

3.3.2. SURVEY INTENSITY AND COVERAGE

The BWSS footprint is spatially extensive and occurs within rugged terrain, making uniform, wall-to-wall coverage impractical. Survey intensity was therefore applied using a representative sampling strategy aligned to the purpose of the assessment, namely: verifying habitat sensitivity and connectivity at the footprint/PAOI scale and identifying sensitive receptors relevant to impact pathways.

Survey effort (two winter days and one summer day; 6–8 hours per day) was concentrated in:

- the mapped nodal infrastructure areas and their 500 m Secondary PAOI zones, where indirect effects are most likely;
- accessible sections of the linear corridor that represent key habitat units and disturbance gradients; and
- higher-risk receptors, particularly riparian corridors/drainage crossings and rocky/cliff-associated habitat features.

This intensity is considered appropriate for a terrestrial biodiversity and plant SCC assessment for a dispersed mountainous bulk water scheme.

3.4. SITE ECOLOGICAL IMPORTANCE

The species environmental assessment guidelines require that a Site Ecological Importance (SEI) be calculated to determine the importance of a project area for species spatially (SANBI, 2020a). the SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g. species of conservation concern, the vegetation/fauna community or habitat type present on the site20) and its resilience to impacts (receptor resilience [RR] as per:

$$SEI = BI + RR.$$

Biodiversity importance is a function of conservation importance (CI) and the functional integrity (FI) of the receptor, as per:

$$BI = CI + FI$$

- **Conservation Importance** is defined as "the importance of a site for supporting biodiversity features of conservation concern present, e.g., populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes" (SANBI, 2020).
- **Functional Integrity** 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" (SANBI, 2020).
- **Receptor Resilience** 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" (SANBI, 2020).

Table 4: Conservation Importance (CI) criteria.

Conservation Importance (CI)	Fulfilling 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 < 10km^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 an EN ecosystem type; and • Globally significant populations of congregatory species (>10% of global population).
High	• Confirmed of highly likely occurrence of CR, EN, VU species that have a global EOO of > 10km^2, IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed threatened only under Criterion A, 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).
Medium	• Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only 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; and • >50% of receptor contains natural habitat to support SCC.
Low	• No confirmed or highly likely populations of SCC; • No confirmed or highly likely populations of range-restricted species; and • <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; and • No natural habitat remaining.

Table 5: Functional Integrity (FI) criteria

Functional Integrity (FI)	Fulfilling Criteria
Very High	• Very large (>100 ha) intact area for any conservation status of ecosystem type or >5a ha for CR ecosystem type; • 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 disturbance (e.g., ploughing)
High	• Large (>5 ha but < 100 ha) intact area for any conservation status ecosystem types; • Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches; and • 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 (>5ha but< 20 ha) semi-intact area for any conservation status ecosystem type or >20 ha for VU ecosystem type; • Only narrow corridors of good 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 invasive flora) and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	• Small (> 1 ha but <5ha) 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; and • 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.

BI = CI + FI

Biodiversity Importance (BI) Rating Matrix

Biodiversity Importance (BI)		Conservation Importance				
		Very High	High	Medium	Low	Very Low
Functional Integrity	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

Table 6: Receptor Resilience criteria (RR)

Resilience	Fulfilling 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 impacts occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
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 impacts occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Habitat that can 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 impacts 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 impacts 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.

SEI = BI + RR

Site Ecological Importance (SEI) Rating Matrix

Site Ecological Importance		Biodiversity Importance				
		Very High	High	Medium	Low	Very Low
Receptor Resilience	Very Low	Very High	Very High	High	Medium	Low
	Low	Very High	Very High	High	Medium	Very Low
	Medium	Very High	High	Medium	Low	Very Low
	High	High	Medium	Low	Very Low	Very Low
	Very High	Medium	Low	Very Low	Very Low	Very Low

Guidelines for development activities within different importance levels are given in the

Table below:

Table 7: Guidelines for interpreting SEI in the context of the proposed development activities.

Site ecological importance	Interpretation 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 are acceptable. Offset mitigation may be required for high-impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium acceptable, followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation - development activities of medium to high acceptable, followed by appropriate restoration activities.
Very low	Minimisation mitigation - development activities of medium to high acceptable, and restoration activities may not be required.

3.5. IMPACT ASSESSMENT METHODOLOGY

Impacts identified were assessed according to the criteria outlined below. Each impact was ranked according to the nature, extent, duration, magnitude, probability, irreplaceable loss of resources and reversibility (Table 8). These criteria are based on the Department of Environmental Affairs and Tourism (DEAT) Guideline Document to the EIA Regulations (1998). A significance rating was calculated as per the methodology outlined below.

The significance rating of each identified impact / effect was further reviewed by the EAP and/or specialist by applying professional judgement. Where possible, mitigatory measures were recommended for the impacts identified.

Table 8. Impact Rating Methodology

Status of impact *The environmental impacts of an activity are those resultant changes in environmental parameters, in space and time, compared with what would have happened had the activity not been undertaken. It is an appraisal of the type of effect the activity would have on the affected environmental parameter. Its description includes what is being affected, and how*	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')

MAGNITUDE OF THE IMPACT		
This provides a qualitative assessment of the severity of a predicted impact / effect.	**None** - where the aspect will have no impact on the environment	0
	Minor - The affected environment is altered, but natural function and process continue.	1
	Low - where the impact affects the environment in such a way that the natural, cultural and social functions / processes are slightly affected.	2
	Moderate - where the affected environment is altered but natural, cultural and social functions / processes continue, albeit in a modified way	3
	High - natural, cultural or social functions / processes are altered to the extent that they will temporarily cease.	4
	Very High - natural, cultural or social functions / processes are altered to the extent that they will permanently cease.	5
IRREPLACEABLE LOSS OF RESOURCES		
Environmental resources cannot always be replaced; once destroyed, some may be lost forever. It may be possible to replace, compensate for or reconstruct a lost resource in some cases, but substitutions are rarely ideal. The loss of a resource may become more serious later, and the assessment must take this into account.	**Short-term** – Quickly recoverable. Less than the project lifespan. The resource can be renewed / recovered with mitigation or will be mitigated through natural process in a span shorter than any of the project phases, or in a time span of 0 to 5 years.	1
	Loss of an 'expendable' resource - one that is not deemed critical for biodiversity targets, planning goals, community welfare, agricultural production, or other criteria.	2
	Medium term – The resource can be recovered within the lifespan of the project. The resource can be renewed / recovered with mitigation or will be mitigated through natural process in a span between 5 and 15 years.	3
	Loss of an 'at risk' resource - one that is not deemed critical for biodiversity targets, planning goals, community welfare, agricultural production, or other criteria, but cumulative effects may render such loss as significant.	4
	Long term – The loss of a non-renewable / threatened resource which cannot be renewed / recovered with, or through, natural process in a time span of over 15 years, but can be mitigated by other means.	5
	Permanent – The loss of a non-renewable / threatened resource which cannot be renewed / recovered with, or through, natural process in a time span of over 15 years, or by artificial means.	7
REVERSIBILITY / POTENTIAL FOR REHABILITATION		

The distinction between reversible and irreversible impacts is a very important one and the irreversible impacts not susceptible to mitigation can constitute significant impacts in an EIA (Glasson *et al*, 1999). The potential for rehabilitation is the major determinant factor when considering the temporal scale of most predicted impacts.	**Short term** – The impact / effect will be returned to its benchmark state through mitigation or natural processes in a span shorter than any of the phases of the project, or in a time span of 0 to 5 years.	1
	Medium term – The impact / effect will be returned to its benchmark state through mitigation or natural processes in a span shorter than the lifetime of the project, or in a time span between 5 and 15 years.	3
	Long term - The impact / effect will be returned to its benchmark state through extensive mitigation or natural processes in a time span between 15 and 25 years.	5
	Permanent – The impact/ effect is permanent and will never be returned to is benchmark state	7
PROBABILITY OF OCCURRENCE		
The likelihood of the impact actually occurring.	**Remote possibility / unlikely**	0
	Possibility	1
	Low probability / anticipated	2
	Medium probability / strongly anticipated	3
	High probability / to be expected	4
	Absolute certainty / will occur	5

IMPACT SIGNIFICANCE

The overall significance of an impact / effect has been ascertained by attributing numerical ratings to each identified impact. The numerical scores obtained for each identified impact have been multiplied by the probability of the impact occurring before and after mitigation. High values suggest that a predicted impact / effect is more significant, whilst low values suggest that a predicted impact / effect is less significant.

((Spatial Extent + Magnitude + Duration) * Probability) = Significance.

	Overall Score
Insignificant – the impact is meaningless has no influence on the decision to develop	< 15
Low – the impact would not have a direct influence on the decision to develop in the area;	16 - 35
Medium – the impact could influence the decision to develop in the area unless it is effectively managed / mitigated; and	36 - 65
High - the impact must have an influence on the decision-making process for development in the area.	> 65

MITIGATION

In terms of the assessment process the potential to mitigate the negative impacts is determined and rated for each identified impact and mitigation objectives that would result in a measurable reduction or enhancement of the impact are considered. The significance of environmental impacts has therefore been assessed considering any proposed mitigation measures. The significance of the impact "without mitigation" is therefore the prime determinant of the nature and degree of mitigation required.

Confidence of assessment	
The degree of confidence in predictions based on available information, Specialist's judgment and/or specialist knowledge.	Low
	Medium
	High

Impact Mitigation Hierarchy and Residual Impacts

A residual biodiversity impact is the impact of an activity, or activities, on biodiversity that remains after all efforts have been made to avoid and minimise the impacts of the activity, or activities, and to rehabilitate the affected area to the fullest extent possible (DFFE, 2023).

After specialists and EAPs, as part of an EIA, identify and assess all negative biodiversity impacts of a development, they must investigate alternative project locations, designs, technologies, scales and layouts to determine if and how potentially significant negative impacts on biodiversity could be avoided or minimised, and how effective rehabilitation practices can be.

If the EIA determines that all negative impacts on biodiversity cannot be avoided, and/or that impact minimisation and rehabilitation of the affected area cannot fully mitigate the impacts of the activity/ies on biodiversity, the proposed development would have residual negative biodiversity impacts. The mitigation hierarchy, as illustrated in Figure 11, should be followed to determine if there will likely be residual impacts.

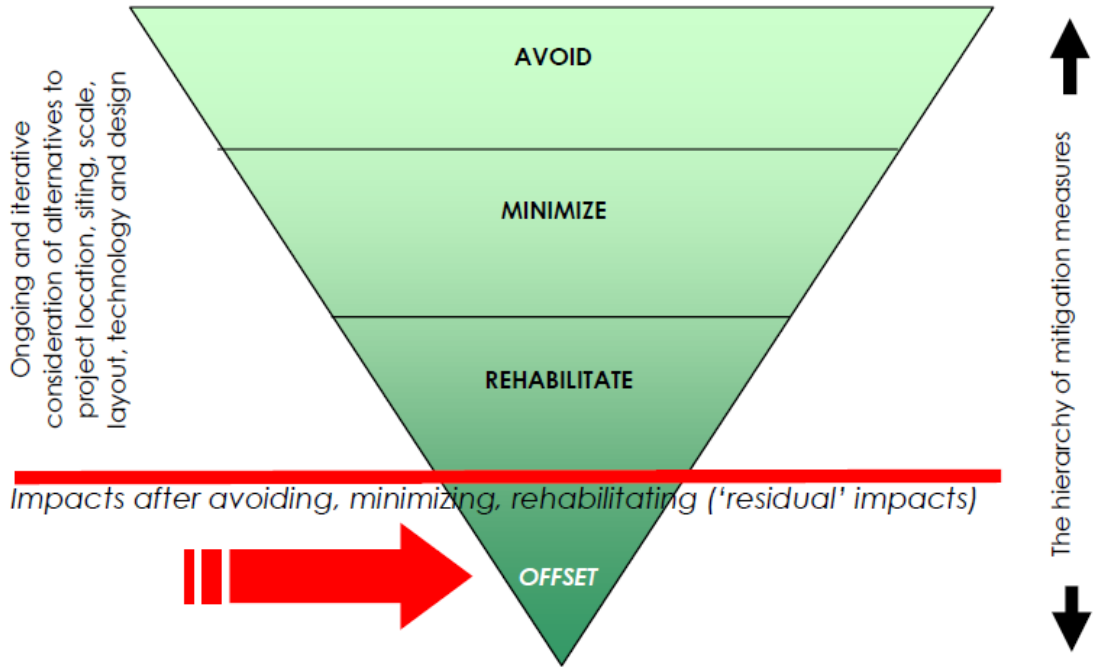


Figure 11: Impact mitigation hierarchy (DFFE, 2023).

Where residual negative biodiversity impacts are evaluated to be of medium or high significance, a biodiversity offset would be required. Impacts of low significance should not require an offset, whereas biodiversity offsets are not deemed appropriated for impacts of very high significance. Very high residual negative impacts that result in the loss or irreplaceable biodiversity should result in the development being considered fatally flawed and avoided.

4. RECEIVING ENVIRONMENT

4.1. Climate

The Blikana River area, located near Sterkspruit in the Eastern Cape, experiences a semi-arid to temperate interior climate. Summers (October–March) are warm to hot, with average daytime temperatures ranging between 25–32°C and occasional thunderstorms contributing most of the annual rainfall. Winters (May–August) are cold and dry, with temperatures frequently dropping below 5°C at night and frost common in low-lying areas. Annual rainfall generally ranges between 400–600 mm, occurring mainly in summer, while winters are typically dry with clear skies and strong winds. The climate is characterised by high evaporation rates, seasonal rainfall variability, and periodic droughts, all of which influence river flow patterns and water resource availability in the Blikana catchment.

4.2. Biodiversity

The project areas fall under the Zastron Moist Grassland and Senqu Montane Shrubland vegetation types. This vegetation unit Zastron Moist Grassland has been classified as Least Concern while the Senqu Montane Shrubland is classified as Least Concern by SANBI (VEGMAP 2018 ecosystem types) in terms of Section 52 of the National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004 (NEMBA). The Blikana area lies at high elevation (approx. 1 560 m above sea level) within the Drakensberg–highland grassland landscape of the Eastern Cape. This landscape forms part of the Grassland biome, and supports extensive montane and upland grasslands interspersed with rivers, wetlands, rocky outcrops, and fynbos-like patches on steep slopes. These environments are strongly influenced by summer rainfall, cold winters and periodic frost, creating a mosaic of microhabitats that support high species diversity.

4.3. Topography and landscape features

The topography of Blikana is characterised by a rugged and undulating landscape typical of the eastern interior highlands (Figure 12). The topography consists of rolling hills, dissected valleys, and elevated plateaus, with steep slopes occurring along river corridors and tributaries. Rocky outcrops and shallow soils are common, particularly on hilltops and upper slopes, while deeper alluvial soils occur along drainage lines. The landscape is largely open and expansive, shaped by erosion processes, seasonal water flow, and long-term grazing activities, resulting in a mosaic of grass-dominated areas, scattered shrubs, and exposed rock surfaces.

4.4. Geology and Soils

Blikana geology is underlain predominantly by sedimentary rocks of the Karoo Supergroup, mainly sandstones and mudstones, with occasional dolerite intrusions that form resistant ridges and rocky outcrops (Figure 13). These geological formations contribute to the undulating to rugged terrain and influence drainage patterns within the catchment. Soils are generally shallow, stony, and moderately to poorly developed on upper slopes and hilltops, while deeper, more fertile alluvial soils occur along valley bottoms and drainage lines. Due to the semi-arid climate and grazing pressure, soils in many areas show signs of compaction and erosion, particularly where vegetation cover is sparse.

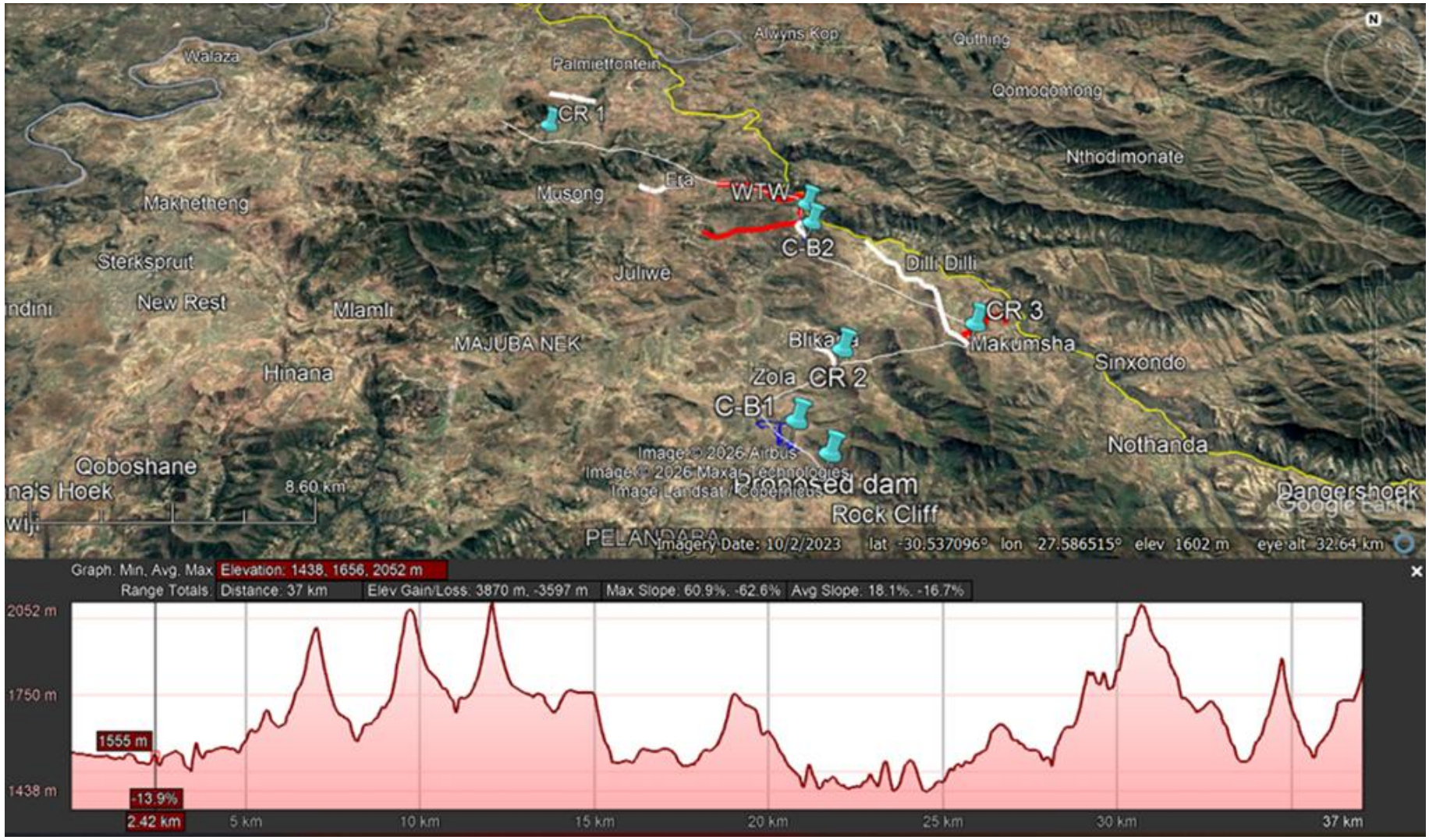


Figure 12: Blikana topographic profile

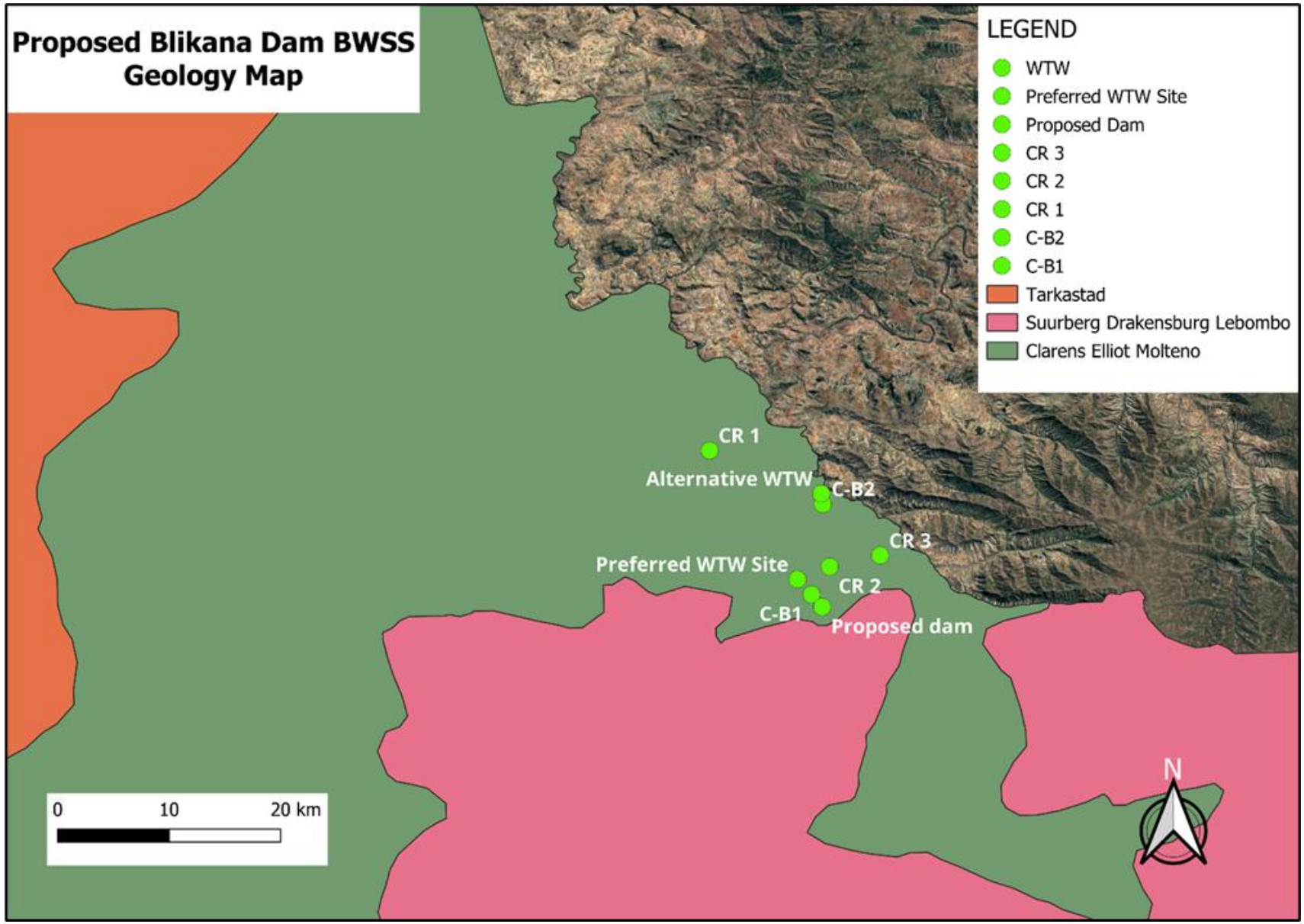


Figure 13: Geology of the study area

5. CONSERVATION PLANNING TOOLS

5.1. BIOME AND VEGETATION

The South African Vegetation Map (SA VEGMAP) of 2018 is an important resource for biodiversity monitoring and conservation management in South Africa. Under the custodianship of the South African National Biodiversity Institute (SANBI) the SA VEGMAP, (2018) was updated in order to '*provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before*'. The map provides a detailed description of each of South Africa's unique vegetation types along with a comprehensive list of the important species associated with each, including endemic and biologically important species.

The South African Biodiversity Institute (SANBI) Vegetation Type of South Africa (2018) database indicates that the proposed development areas are located in the Grassland Biome and within the Zastron Moist Grassland (Gm 1) and Senqu Montane Shrubland (Gm 2) vegetation type.

The proposed sites are located within the Senqu Montane Shrubland, recognised as a high-altitude shrubland vegetation unit occurring within the upper catchment of the Senqu (Orange) River system, primarily in the north-eastern Eastern Cape and adjacent Lesotho highlands. This cold, frost-prone montane shrubland is associated with rocky slopes, shallow soils, and high elevations typically above ±1 600 m. It forms a transitional mosaic between Drakensberg–Maloti montane grasslands and karoo-like shrublands, characterised by low, woody shrubs interspersed with grasses and forbs. Dominant structural elements include small-leaved shrubs (often Asteraceae and Fabaceae), dwarf karroid shrubs, and hardy montane grasses adapted to fire, grazing, and extreme seasonal temperature variation. Whereas the Zastron Moist Grassland occurs in the high-lying interior around Zastron in the southern Free State and extends into adjacent parts of the north-eastern Eastern Cape, particularly near the Lesotho border. This vegetation type is characterised by moist, high-altitude grassland on gently undulating plains and foothills, typically between ±1 400–1 800 m above sea level. The vegetation is dominated by perennial grasses such as *Themeda triandra*, *Eragrostis* spp., and *Festuca* spp., with a rich assemblage of forbs and geophytes. Trees are generally absent except along drainage lines. The area experiences summer rainfall, frequent frost, and periodic fire, which maintain the open grassland structure.

Below is a discussion on the **Senqu Montane Shrubland** Vegetation type:

Distribution: It is found in Lesotho as well as in Eastern Cape and Free State Provinces: Mainly in the lower Senqu Valley, particularly in the Moyeni (Quthing)–Mount Moorosi regions, strongly attenuating upstream northwards in the direction of Thaba-Tseka. Extends into South Africa mainly south of the Orange River in the Herschel District. This shrubland unit covers the valley slopes of the Senqu River as well as its numerous tributaries. Altitude 1 600–1 900 m, with outliers found as low as 1 440 m and reaching 1 960 m in places.

Vegetation & Landscape Features: The vegetation occurs on restricted to steep, boulder-strewn slopes of valleys and deep gullies, supporting open-canopy montane shrubland. The shrub species diversity decreases towards low-lying, southwestern areas. The vegetation is dominated by evergreen shrubs, namely *Rhus erosa*, *Olea europaea* and *Diospyros austro-africana*. In a few sheltered inaccessible areas, the shrubland turns into thicket with *Kiggelaria africana*, *Leucosidea sericea* and *Rhamnus prinoides*.

Geology & Soils: The vegetation occurs in Karoo Supergroup sedimentary rocks of the Clarens, Elliot and Molteno Formations as the Senqu River cuts through the landscape in the low-lying southwestern regions. Intrusive Drakensberg Group (Jurassic) basalts at high altitudes at the interface with the Gd 8 Lesotho Highland Basalt Grassland. Dominant land type Fa, followed by the Ea. The most common soil forms that dominate these lands types are Mispah and Glenrosa.

Climate: Summer rainfall, with overall MAP of 687 mm. Much of the rainfall is convectional. Cool-temperate thermic pattern (MAT around 13°C), with 52 days of frost incidence.

Important Taxa:

Graminoids: *Eragrostis curvula, Hyparrhenia hirta, Agrostis subulifolia, Andropogon appendiculatus, Aristida bipartita, A. congesta, A. diffusa, A. junciformis subsp. galpinii, Brachiaria nigropedata, Cymbopogon nardus, C. pospischilii, Elionurus muticus, Eragrostis capensis, E. chloromelas, E. pallens, E. plana, E. planiculmis, E. racemosa, E. trichophora, Harpochloa falx, Helictotrichon longifolium, Heteropogon contortus, Hordeum capense, Hyparrhenia anamesa, Koeleria capensis, Melica decumbens, M. racemosa, Melinis nerviglumis, Merxmuellera disticha, Microchloa caffra, Pennisetum macrourum, P. sphacelatum, Pentaschistis setifolia, Setaria sphacelata, Sporobolus africanus, S. centrifugus, S. fimbriatus, Stipagrostis uniplumis var. neesii, Streblochaete longiarista, Tetrachne dregei, Themeda triandra, Trachypogon spicatus, Tragus racemosus, Tristachya leucothrix..*

Herbaceous climber: *Albuca setosa, Androcymbium burkei, Asclepias gibba, A. multicaulis, Bulbine abyssinica, B. capitata, B. frutescens, Cheilanthes eckloniana, C. viridis, Ledebouria cooperi, Moraea pallida, Pellaea calomelanos, Raphionacme hirsuta, Schizoglossum bidens subsp. bidens, Zantedeschia albomaculata subsp. albomaculata*

Herbs: *Aster bakerianus, Berkheya setifera, Chamaesyce inaequilatera, Commelina africana, Convolvulus thunbergii, Dicoma anomala, Erucastrum strigosum, Geigeria filifolia, Gerbera piloselloides, Haplocarpha scaposa, Helichrysum caespititium, H. chionosphaerum, Hermannia coccocarpa, H. depressa, H. gerrardii, Lobelia flaccida, Monsonia angustifolia, Nemesia rupicola, Rhynchosia pentheri, Salvia stenophylla, Sebaea natalensis, Selago galpinii, Senecio asperulus, S. bupleuroides, S. subcoriaceus, Tribulus terrestris, Ursinia saxatilis*.

Geophytic Herb: *Albuca setosa, Androcymbium burkei, Asclepias gibba, A. multicaulis, Bulbine abyssinica, B. capitata, B. frutescens, Cheilanthes eckloniana, C. viridis, Ledebouria cooperi, Moraea pallida, Pellaea calomelanos, Raphionacme hirsuta, Schizoglossum bidens subsp. bidens, Zantedeschia albomaculata subsp. Albomaculata.*

Succulent Herbs: *Aloe maculata, A. pratensis, Crassula capitella, C. lanceolata subsp. lanceolata, C. muscosa, C. nudicaulis*.

Low Shrubs: *Artemisia afra, Chrysocoma ciliata, Felicia filifolia, Helichrysum melanacme, Agathosma ovata, Anthospermum rigidum subsp. pumilum, Clutia hirsuta, Eriocephalus tenuifolius, Euryops oligoglossus subsp. oligoglossus, Gomphocarpus fruticosus subsp. fruticosus, Gomphostigma virgatum, Helichrysum odoratissimum, H. zeyheri, Heliophila carnosa, Indigofera nigromontana, Lantana rugosa, Melolobium candicans, Morella serrata, Muraltia saxicola, Nenax microphylla, Polygala uncinata, Printzia auriculata, Rhus dregeana, Rubus ludwigii, Senecio pterophorus, Solanum tomentosum, Stachys rugosa*.

Succulent Shrubs: *Aloe broomii, Chasmatophyllum musculinum, C. verdoorniae, Delosperma ashtonii, D. concavum, D. congestum, D. hirtum, D. obtusum, Euphorbia clavarioides var. clavarioides, E. pulvinate.*

Small Trees & Tall Shrubs: *Diospyros austro-africana var. rubriflora, D. lycioides subsp. lycioides, Euclea coriacea, Rhamnus prinoides, Rhus divaricate, R. erosa, Buddleja loricata, B. salviifolia, Clutia pulchella, Euclea crispa subsp. crispa, Grewia occidentalis, Gymnosporia heterophylla, Heteromorpha arborescens var. abyssinica, Myrsine africana, Olea europaea subsp. africana, Passerina montana, Polygala virgata var. decora, Rhus burchellii, R. dentata, R. pyroides, Tarchonanthus minor, Acacia karroo, Celtis africana, Cussonia paniculata, Kiggelaria africana, Pittosporum viridiflorum*.

Succulent Tree: *Aloe ferox.*

Conservation: Least threatened. Target 28%. None conserved in statutory conservation areas. Some 14% already transformed for cultivation. Wood collection is putting this vegetation under severe pressure. Accessible areas have been severely degraded and the shrubland has been reduced. Erosion

(ranging across large scales of intensity), caused by degradation of the shrubland vegetation, has resulted in the formation of dongas that cut back into the valleys, destroying the remaining riparian. vegetation in places. Much of the upper reaches of this vegetation unit will disappear should the planned further phases (II, III and IV) of the Lesotho Highlands Water Project be implemented and result in the construction of the Mashai, Tsoelike and Ntoahae Dams.

Below is a discussion on the **Zastron Moist Grassland** Vegetation type:

Distribution: It is found in Eastern Cape and Free State Provinces and Lesotho: Surrounds of Zastron, extends just short of Van Stadensrus (north) to Mohales Hoek (northeast) and Rouxville

(west). A narrow corridor extends south towards Jamestown and Dordrecht. Altitude 1 400–1 720 m.

Vegetation & Landscape Features: The vegetation occurs on Undulating plains, broken in places due to sandstone outcrops forming extensive terraces. These plains bear a mosaic of moist open sour grassland with affinity to Gm 4 Eastern Free State Sandy Grassland, on elevated areas above sandstone outcrops and Gm 3 Eastern Free State Clay Grassland in low-lying eroded areas as well as mudstone outcrops.

Figure 14: Vegetation and landscape features

Geology & Soils: The vegetation occurs in a relatively deep sandy layer over the sandstone layers of the Tarkastad Subgroup (Molteno and Elliot Formations) of the Beaufort Group (Karoo Supergroup). Typical soil forms present on these sandstone terraces are Clovelly and Avalon. Clayey soils, which were formed by weathering and leaching processes, are concentrated in low-lying drainage lines, valley bottoms and depressions. Db land type dominates, with typical soil forms such as Estcourt and Oakleaf forms present. Fb and Ca land types of minor importance.

Climate: Summer rainfall which peaks in March. MAP 615 mm. MAT of 14°C indicates cool-temperate climate. The inland position of the unit results in high thermic continentality: summers are very hot, while winter can be bitterly cold. Frost is a common phenomenon.

Important Taxa:

Graminoids: *Aristida congesta, Cymbopogon pospischilii, Digitaria argyrograpta, Eragrostis chloromelas, Microchloa caffra, Setaria sphacelata, Themeda triandra, Andropogon appendiculatus, Brachiaria serrata, Cynodon incompletus, Cyperus obtusiflorus var. obtusiflorus, Elionurus muticus, Eragrostis capensis, E. curvula, E. lehmanniana, E. plana, E. racemosa, Festuca scabra, Harpochloa falx, Heteropogon contortus, Panicum gilvum, Sporobolus africanus, Tetrachne dregei, Trichoneura grandiglumis, Triraphis andropogonoides.*

Herbs: *Berkheya onopordifolia var. onopordifolia, Dianthus thunbergii, Gazania krebsiana subsp. krebsiana, Helichrysum rugulosum, Hermannia depressa, Limeum argute-carinatum, Nolletia ciliaris,*

Salvia stenophylla, Senecio erubescens var. crepidifolius, Trichogyne paronychioides, Wahlenbergia denticulata.

Geophytic Herb: *Moraea pallida.*

Low Shrubs: *Helichrysum dregeanum, Anthospermum rigidum subsp. pumilum, Chrysocoma ciliata, Felicia muricata, Helichrysum asperum var. albidulum, H. niveum, Selago saxatilis, Senecio burchellii*.

Conservation: Vulnerable. Target 24%. None conserved in statutory conservation areas and only very small portion protected in private Vulture Conservation Area. Almost a third already transformed by cultivation or by urban sprawl. Erosion high (45%), moderate (26%), very high (19%) and low (10%).

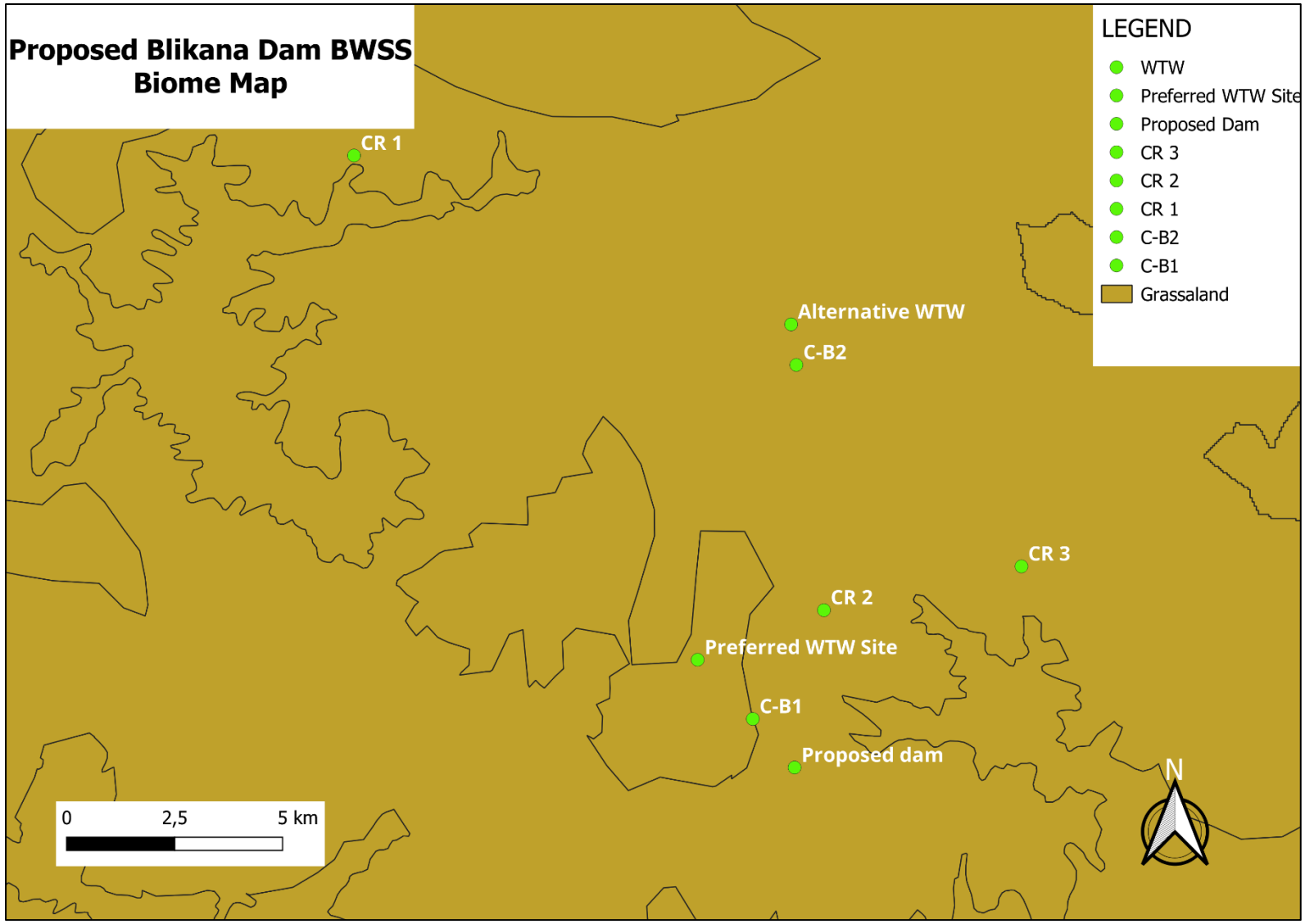


Figure 15: Biome of the study area

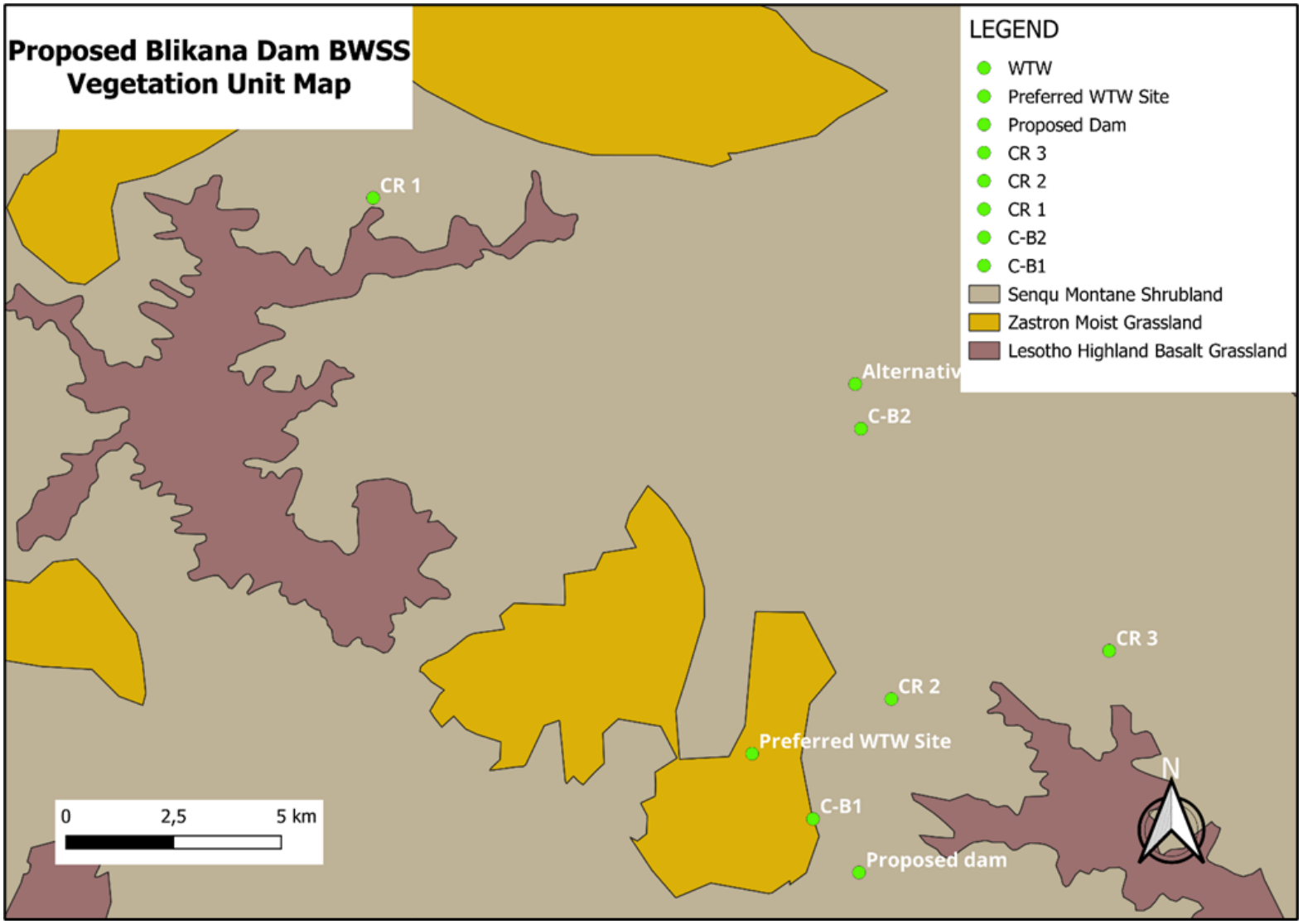


Figure 16: Vegetation of the study area

5.2. PROTECTED AREAS

The formal protected areas include land-based and marine protected areas that are recognised in terms of the Protected Areas Act (Act 57 of 2003). These are:

Table 9: Formal Protected Areas

Formal A Protected Areas	
Forest Act Protected Area	Specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998)
Island Reserve	A sub-set of provincial nature reserves, which are islands administered by provinces in terms of provincial legislation
Marine Protected Area	An area declared as a marine protected area in terms of section 43 of the Marine Living Resources Act, 1998 (Act No. 18 of 1998)
National Park	An area declared in terms of the National Parks Act, 1976 (Act No. 57 of 1976), or in terms of Section 20 of the Protected Areas Amendment Act, 2004 (Act No. 31, 2004), including private areas declared under this legislation
Other national protected area	A nature reserve other than a national park or special nature reserve, managed by a national organ of state or which falls under the jurisdiction of the Minister for any other reason
Provincial Nature Reserve	An area declared in terms of section 23 of Protected Areas Act, 2003 (No. 57 of 2003), or declared in terms of provincial legislation for conservation purposes, and which is managed by a provincial organ of state, including private areas declared under this legislation
Special nature reserve	An area which was a special nature reserve in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or an area declared in terms of section 18 of Protected Areas Act, 2003 (No. 57 of 2003)
World Heritage Site	A world heritage site declared in terms of the World Heritage Convention Act, 1999 (Act No. 49 of 1999)
MPA	Marine Protected Area, usually associated with an adjacent terrestrial protected area and managed by the same agency.
Formal B Protected Areas	
Mountain Catchment Area	An area declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970)
Local Nature Reserve	A nature reserve which is managed by a municipality, potentially of undefined legal status
National Botanical Garden	A reserve managed by the South African National Botanical Institute

It does not include:

- Informal conservation areas (e.g., conservancies); and
- Non-natural areas within Protected Environments

According to the National Protected Areas, the proposed Blikana Dam BWSS does not fall within or near a protected area. There are no formal or non-formal protected areas within 5km of the proposed works area.

5.3. FOREST PATCHES

DWAF is responsible for approximately 500,000 ha of indigenous forests. Most forest patches are small and scattered with only a few consolidated large areas such as Knysna or the Amathola. DWAF only recently completed a national audit of forests and up until that time did not know the full extent of them and who was managing them.

DWAF did not until recently have explicit transfer policies for indigenous forests. A number of transfer initiatives did start however in response to ad hoc situations. These are:

- Knysna
- Pondoland
- Mpumalanga Lowveld
- Dwesa Cwebe
- Woody Cape

The proposed development area does not intercept with any indigenous forest patches according to DWAF.

5.4. NATIONAL PROTECTED AREAS EXPANSION STRATEGY

These are focus areas for land-based protected area expansion are large, intact and unfragmented areas of high importance for biodiversity representation and ecological persistence, suitable for the creation or expansion of large, protected areas. The focus areas were identified through a systematic biodiversity planning process undertaken as part of the development of the National Protected Area Expansion Strategy 2008 (NPAES). They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities.

According to NPAES, the study area does not lie within any NPAES Focus Areas. There is a Southern Berg Griqualand located approximately 3 km away from other project components (Figure 17).

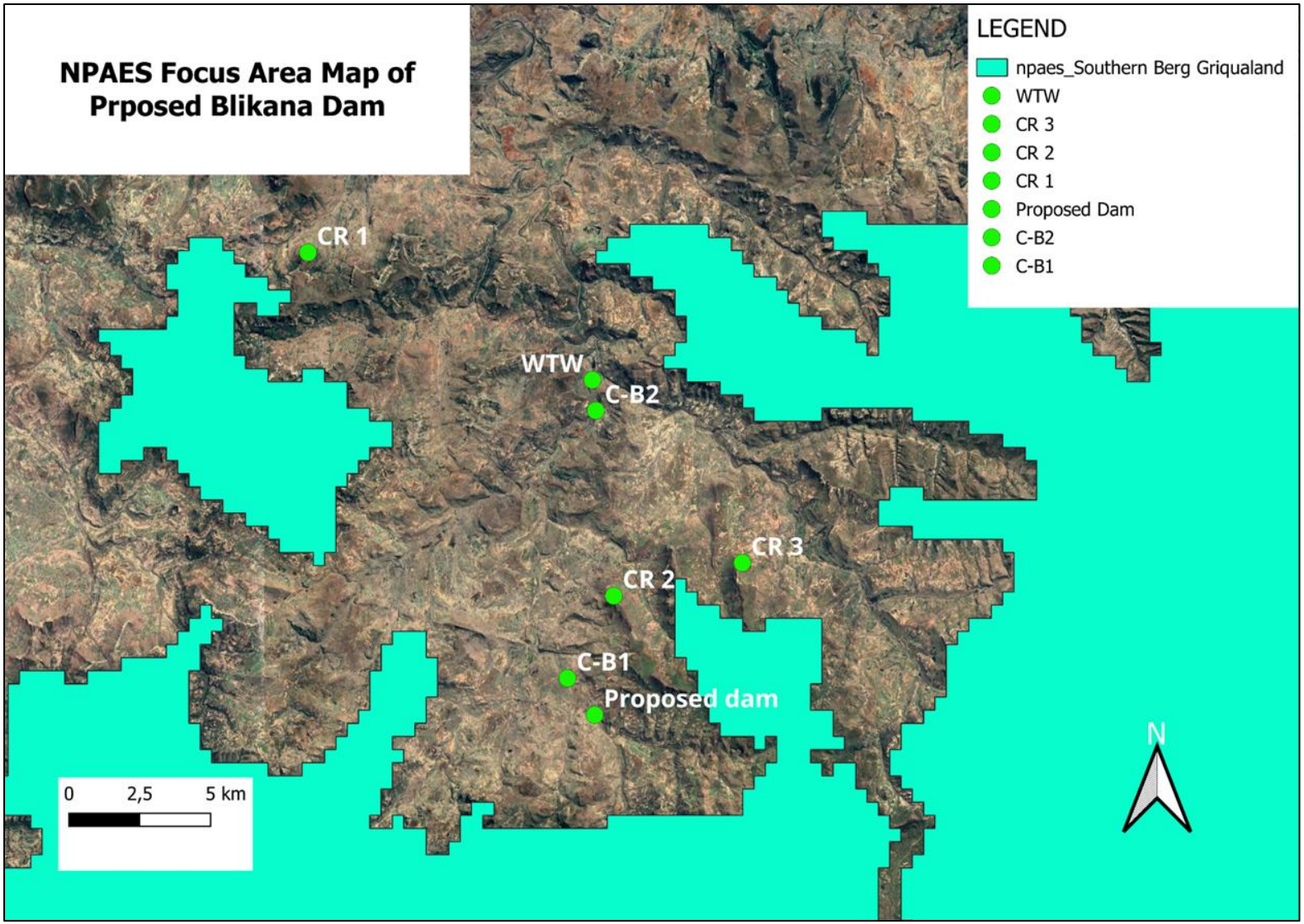


Figure 17: NPAES Focus Area Map

5.5. NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS

The National Freshwater Ecosystem Priority Areas (NFEPA) project is a collaborative national initiative that aims to conserve South Africa's freshwater ecosystems and promote the sustainable use of water resources. It does so by identifying Freshwater Ecosystem Priority Areas (FEPAs) and providing strategies to protect them in line with national biodiversity goals for freshwater systems. These goals are guided by the National Water Act (Act 36 of 1998), the National Environmental Management: Biodiversity Act (Act 10 of 2004), and the National Environmental Management: Protected Areas Act (Act 57 of 2003) ((Nel et al., 2011)0.

The NFEPA project identified various categories of freshwater conservation areas, including River FEPAs, wetland and estuary FEPAs, wetland clusters, Phase 2 FEPAs, and their associated sub-quaternary catchments. It also defined Fish Sanctuaries, Fish Migration Corridors, and Upstream Management Areas to conserve populations of threatened freshwater fish species. Fish Sanctuaries were delineated at the sub-quaternary catchment scale and five types of conservation zones were identified:

- Fish Sanctuaries – critical areas to meet fish population targets;
- Fish Migration Corridors – routes needed for fish movement between habitats;
- Rehabilitation and Translocation Areas – essential for the survival of highly threatened fish species;
- Upstream Management Areas – areas needing protection to avoid downstream impacts;
- FishSA – species-specific sanctuaries aligned with national conservation priorities.

The proposed development falls within the Blikana and Tele River catchments (Figure 18), which are designated as National Freshwater Ecosystem Priority Areas (NFEPA). Infrastructure associated with the development, including gravity and rising mains, dams, and Water Treatment Works, has the potential to impact these freshwater systems through altered flow regimes, sedimentation, water quality deterioration, and habitat disturbance. A detailed assessment of these potential impacts will be undertaken in the aquatic specialist report.

5.6. NATIONAL LIST OF THREATENED ECOSYSTEMS

The NEMBA (Act 10 of 2004) provides for listing of threatened or protected ecosystems, in one of four categories: Critically Endangered, Endangered, Vulnerable or Protected. Threatened ecosystems are listed to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value (SANBI, Biodiversity Geographic information Systems (BGIS)). Importantly, any land-use change application occurring within an ecosystem listed as Critically Endangered or Endangered in terms of the Biodiversity Act will automatically require environmental authorisation. Both the Senqu montane shrubland and the Zastron moist grassland are not listed as threatened ecosystems, in the List of Threatened Ecosystems (2021).

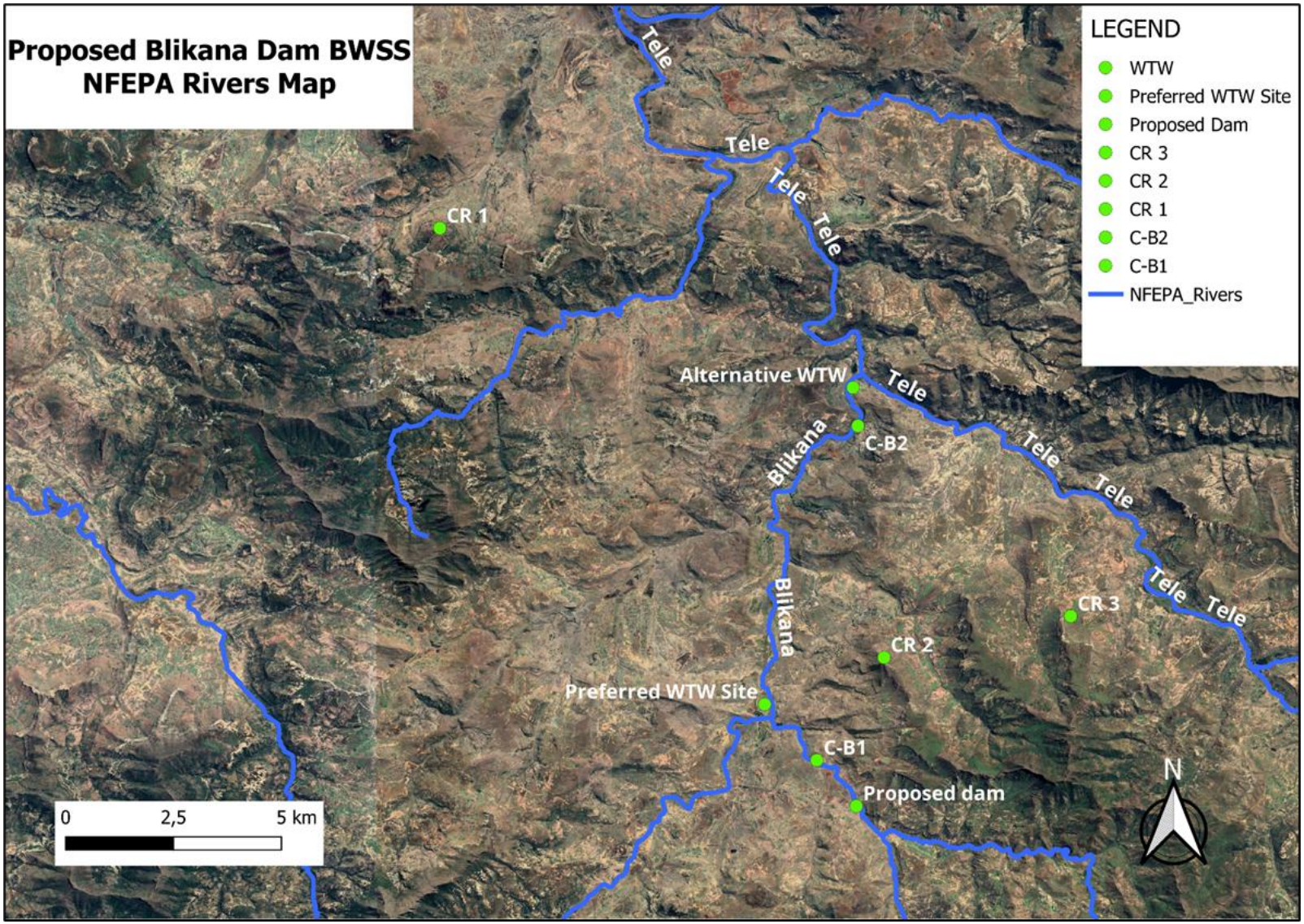


Figure 18: NFEPA Rivers associated with the BWSS project

5.7. NATIONAL BIODIVERSITY ASSESSMENT (NBA)

The National Biodiversity Assessment (NBA) is the primary tool for monitoring and reporting on the state of biodiversity in South Africa. It is prepared as part of the South African National Biodiversity Institute's (SANBI) mandate to monitor and report regularly on the status of South Africa's biodiversity and is a collaborative effort from many institutions and individuals. The NBA focusses primarily on assessing biodiversity at the ecosystem and species level, with efforts being made to include genetic level assessments. Two headline indicators that are applied to both ecosystems and species are used in the NBA: threat status and protection level. The primary purpose of the NBA is to provide a high-level summary of the state of South Africa's biodiversity at regular points in time, with a strong focus on spatial information. As a body of work the NBA is not prescriptive; it presents important information that can be adopted by government and civil society in various decision-making processes to support socio-economic imperatives, human wellbeing, and the best management and conservation of South Africa's biodiversity.

The NBA relies on two headline indicators that can be applied to both ecosystems and species: threat status and protection level. The first indicator (threat status) is based on the IUCN risk assessment framework for species (Red List of Species) (IUCN, 2012a) and ecosystems (Red List of Ecosystems) (Bland & Keith et al., 2017). The IUCN Red List of Species is well established globally and in South Africa and has formed a part of the NBA reporting since 2005 (Driver et al., 2005). The IUCN Red List of Ecosystems (RLE) is relatively new (v1.0 released in 2016) and prior to its development South Africa developed its own ecosystem threat status assessment framework between 2004 and 2008 (RSA, 2011) making South Africa one of the pioneers globally of this approach to ecosystem assessment. The second indicator, protection level, was developed in South Africa for national reporting (Driver et al., 2004) and addresses the extent to which ecosystems and species are protected.

Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of each ecosystem type that remains in good ecological condition relative to a series of thresholds. For the NBA 2018 the IUCN Red List of Ecosystems was used as the risk assessment framework for terrestrial ecosystems (Bland et al., 2017).

Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected, Poorly Protected, Moderately Protected or Well Protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003).

According to the NBA (2018, 2021) ecosystem types, the proposed development sites fall within a Least Concerned ecosystem (Figure 19). Regarding the ecosystem protection level, the proposed development area is within a Not Protected Area (Figure 20).

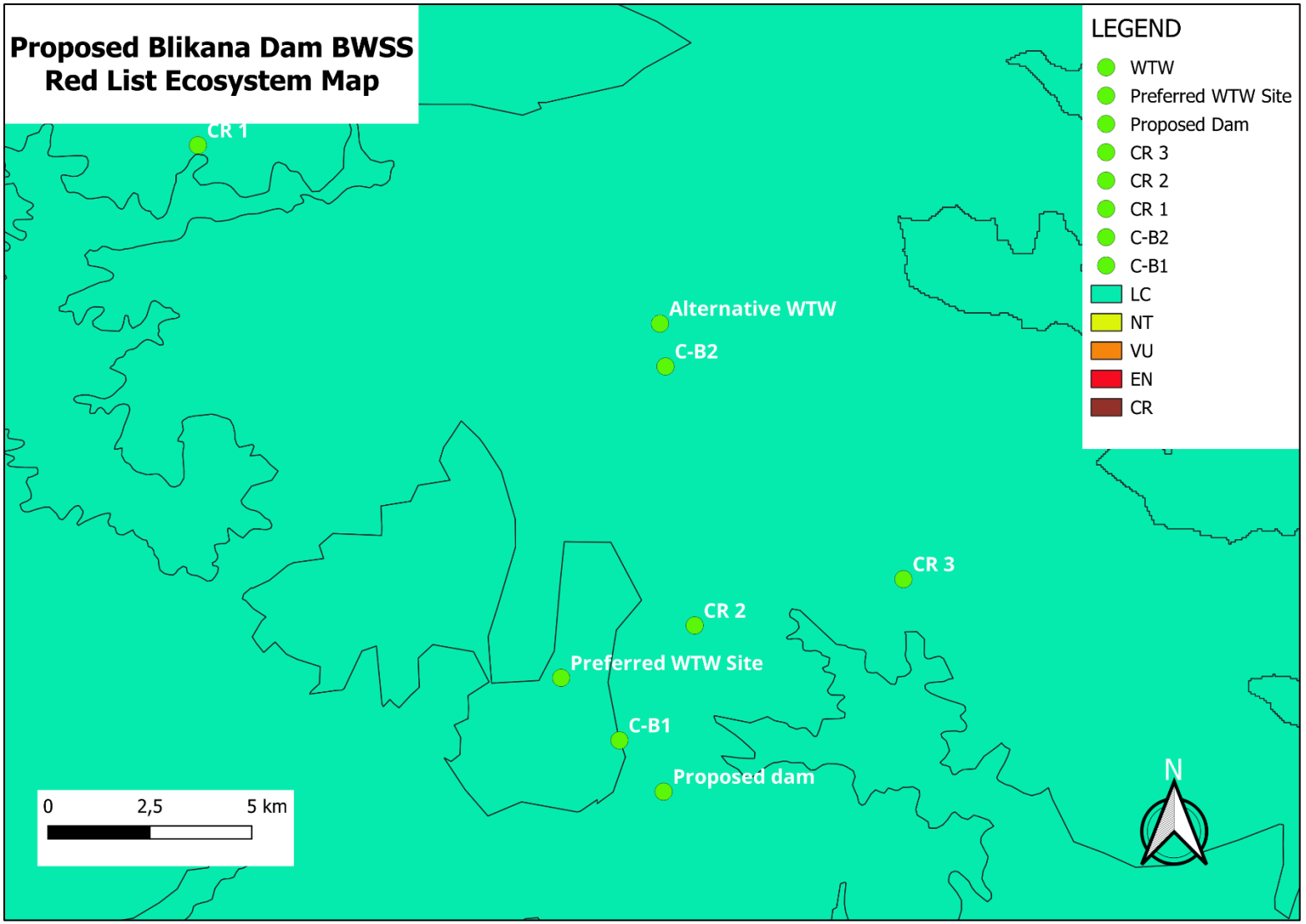


Figure 19: Ecosystem conservation status

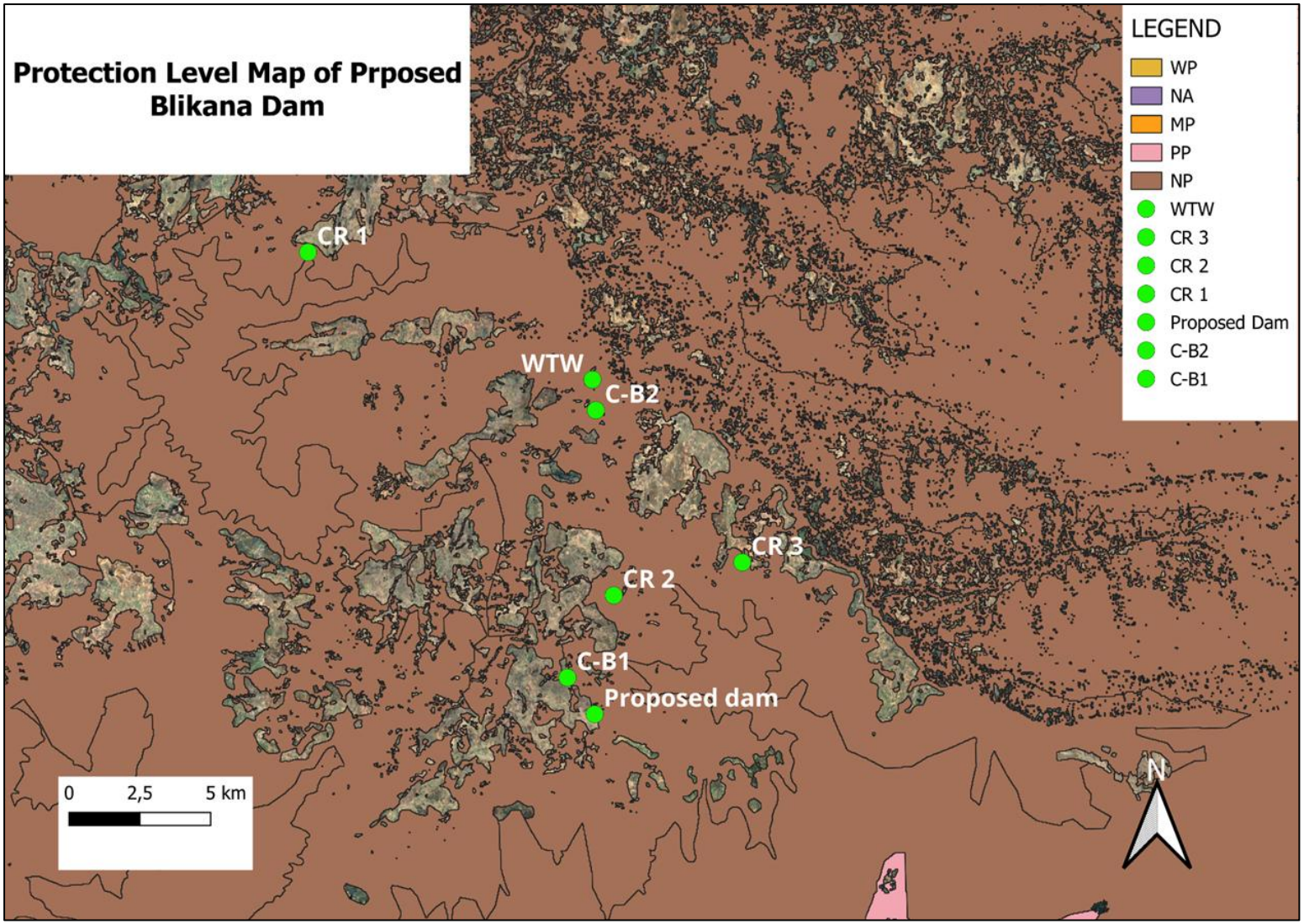


Figure 20: Protection level status

5.8. BIODIVERSITY CONSERVATION PLANS – EASTERN CAPE BIODIVERSITY CONSERVATION PLAN

The Eastern Cape Biodiversity Conservation Plan (ECBCP) (2019) replaces the ECBCP (2007) in its entirety and provides a map of important biodiversity areas, outside of the Protected Areas network, which must be used to inform land use and resource-use planning and decision making. The objectives of the ECBCP (2019) are to:

1) Identify the minimum spatial requirements needed to maintain a living landscape that continues to support all aspects of biodiversity and retain/maintain essential ecological infrastructure. This is achieved through the selection of areas, based on achieving targets, which represent important biodiversity pattern AND ecological processes;

2) Serve as the primary source of biodiversity information for land use planning and decision making; and

3) Inform conservation and restoration action in important biodiversity areas.

The aim of the ECBCP (2019) was to map biodiversity priority areas through a systematic conservation planning process. The main outputs of the ECBCP include Protected Areas (PA), Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), Other Natural Areas (ONA) and No Natural Habitat Remaining (NNR) for both terrestrial and aquatic ecosystems. The ECBCP (2019) has been adopted by DEDEAT as a systematic biodiversity plan for the Eastern Cape Province. According to the ECBCP (2019), the study area falls within a Terrestrial ESA 1 (Figure 21).

Although ECBCP is mapped at a finer scale than the National Spatial Biodiversity Assessment (Driver et al., 2005) it is still, for the large part, inaccurate and “coarse”. Therefore, it is imperative that the status of the environment, for any proposed development must first be verified before the management recommendations associated with the ECBCP are considered (Berliner and Desmet, 2007). No fine-scale plans are yet available for the study area. According to the ECBCP 2019 Handbook, the following management objectives apply to ESAs:

Table 10: Management objectives for Terrestrial ESA 1

CBA MAP CATEGORY	MANAGEMENT OBJECTIVES
ESA 1	Maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem services are maintained. For areas classified as ESA1, the following objectives apply: • These areas are not required to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery and climate change resilience. • These systems may vary in condition and maintaining function is the main objective, therefore: → Ecosystems still in natural, near natural state should be maintained. → Ecosystems that are moderately disturbed/degraded should be restored.

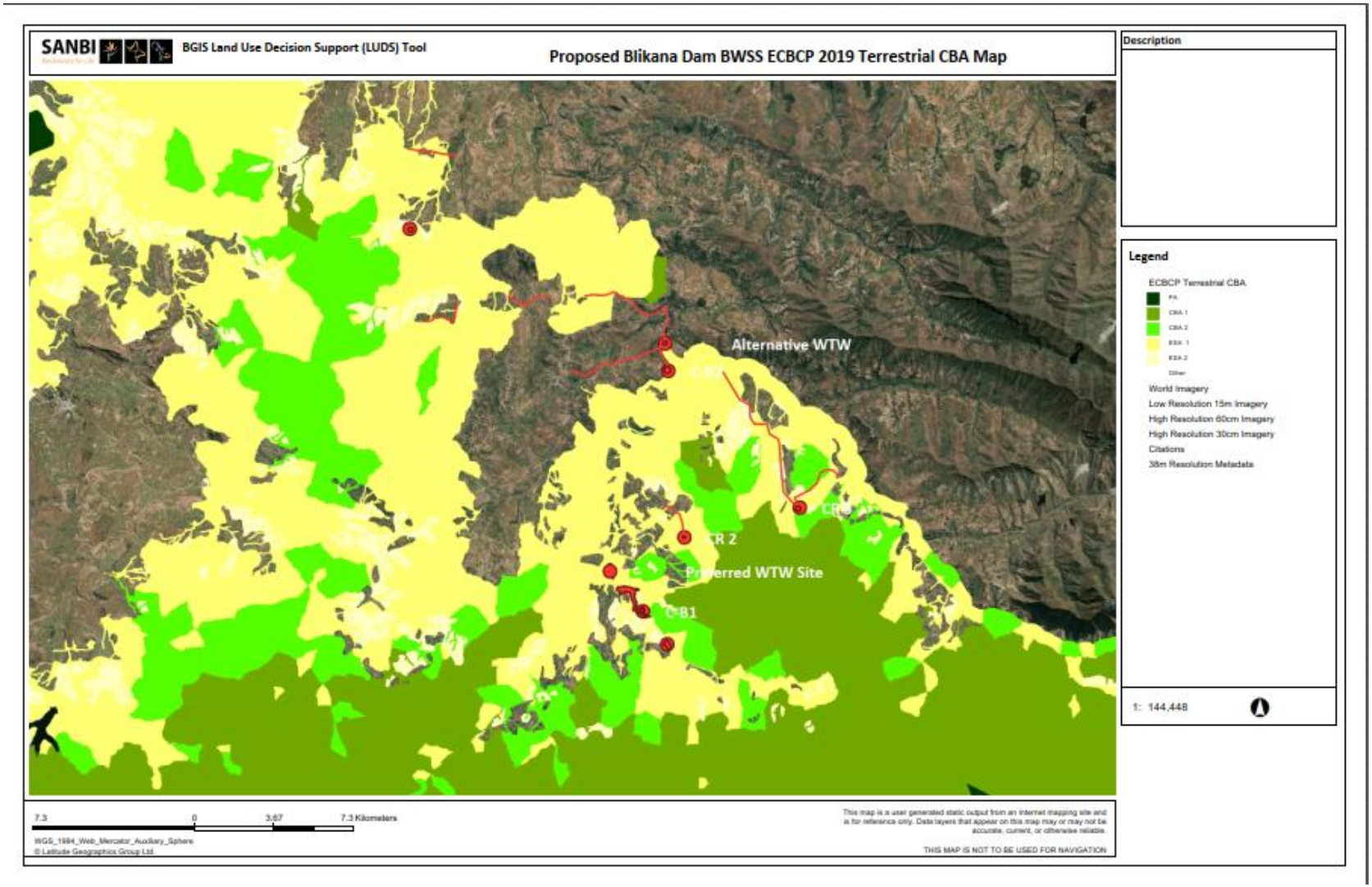


Figure 21: ECBCP Terrestrial CBAs and ESAs (2019)

5.9. IMPORTANT BIRD AREAS

The Important Bird and Biodiversity Areas (IBA) Programme is a Birdlife International Programme to conserve habitats that are important for birds. These areas are defined according to a strict set of guidelines and criteria based on the species that occur in the area. The Important Bird Areas of Southern Africa directory was first published 1998 and identified within South Africa 122 IBAs. In September 2015 a revised IBA Directory was published by Birdlife South Africa. All these IBAs were objectively determined using established and globally accepted criteria. An IBA is selected on the presence of the following bird species in a geographic area:

- Bird species of global or regional conservation concern;
- Assemblages of restricted-range bird species;
- Assemblages of biome-restricted bird species; and
- Concentrations of numbers of congregator bird species.

According to the IBA database, the proposed BWSS does not fall within any Important Bird and Biodiversity Areas.

5.10. STRATEGIC WATER SOURCE AREAS

Strategic Water Source Areas (SWSAs) are now defined as areas of land that either: (a) supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size and so are considered nationally important; or (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b). They include transboundary Water Source Areas that extend into Lesotho and Swaziland. All surface water SWSAs are located in high rainfall areas where baseflow is at least 11 25 mm/a, which is evidence of a strong link between groundwater and surface water in the SWSAs. The aquifers sustain baseflow, contribute to runoff and, especially, contribute to dry season flows. Sustained river flows are important as they support people and communities who depend directly on rivers for their water, especially during the dry season and droughts.

Surface water

The 2018 national and transboundary surface-water SWSAs (refer to the map that follows) cover about 124 075 km2 (10% of the region) and provide a MAR of 24 954 million m3 (50% of the total). The greatest volume of MAR is generated by the Southern Drakensberg (9% of national and transboundary MAR), followed by the Eastern Cape, Northern Drakensberg and Maloti Drakensberg, and the Boland. The Boland has the highest MAR per unit area (3588 m3/ha/year), followed by Table Mountain, the Northern Drakensberg and the Mpumalanga Drakensberg.

Seven of these SWSAs are transboundary areas because Lesotho and Swaziland include portions of important SWSAs for South Africa. The portions of the SWSAs that fall within Lesotho (Eastern Cape, and the Southern, Northern and Maloti Drakensberg) cover 18 570 km2 and generate a MAR of about 3522 million m3. This MAR sustains the Orange and Caledon Rivers and supplies water to Gauteng via the Lesotho Highlands water supply system. In the case of Swaziland, the portions of the SWSAs falling in this country (Ekangala Drakensberg, Mbabane Hills, Upper Usutu) total 9376 km2 and produce a MAR of about 2053 million m3. In total, the SWSAs in these two countries produce about 11% of the total MAR, which is a substantial contribution that needs to be protected.

Groundwater

The newly defined groundwater SWSAs cover around 9% of the land surface of South Africa (see map). They account for up to 42% of the river baseflow generated by these water source areas and have a key role in sustaining surface water flows during the dry season. The total groundwater recharge (replenishment) for South Africa is estimated to be 34 912 million m3/a, and the recharge generated within surface water SWSAs is 11 675 million m3/a (33%) whereas the groundwater SWSAs generate

5397 million m3/a (15%). The relatively low value for groundwater SWSAs is due to the method used in their delineation, in which only the areas of overlap between high recharge and high levels of use or dependence were identified at national level. According to the Strategic Water Source Area map, the proposed treatment works project belongs to the Eastern Cape Drakensburg SWSA 2017 (Figure 22).

5.10.1. EASTERN CAPE DRAKENSBERG SWSA

The Eastern Cape Drakensberg Strategic Water Source Area is a nationally important high-altitude catchment identified by the South African National Biodiversity Institute as a priority water-producing landscape. Located along the Drakensberg–Maloti escarpment near the Lesotho border, it comprises montane grasslands, wetlands, and headwater streams that generate a disproportionate share of surface water feeding major river systems such as the Orange River (Senqu system) and the Mzimvubu River. Although covering a relatively small land area, it plays a critical role in national water security, biodiversity conservation, and climate resilience, and is highly sensitive to land degradation, overgrazing, invasive species, and inappropriate development.

5.11. SOUTH AFRICAN PROTECTED AREAS DATABASE

The South African Protected Areas Database (SAPAD) contains spatial data for the conservation estate of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. Data is collected by parcels which are aggregated to protected area level. The purpose of SAPAD is to produce and maintain a comprehensive spatial database on the conservation estate in South Africa. SAPAD is suitable for a wide range of planning, assessment, and analysis and display purposes. According to SAPAD, the proposed Blikana Dam BWSS areas are not located within a SAPAD area.

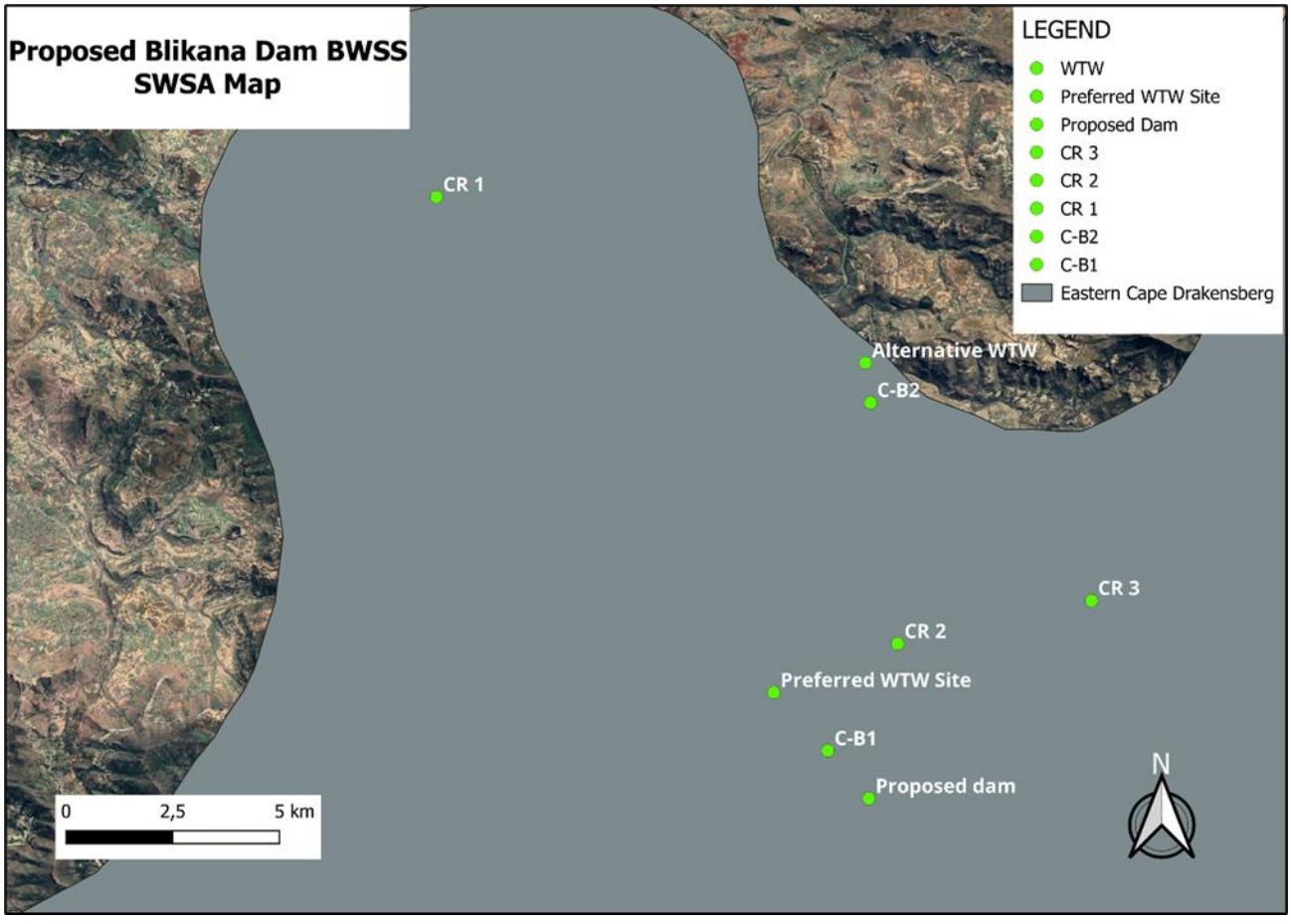


Figure 22: Strategic Water Source Area Map

6. ECOLOGICAL ASSESSMENT

6.1. VEGETATION COMMUNITY COMPOSITION

The assessed BWSS footprint/PAOI occurs within a mountainous landscape dominated by an open montane grassland matrix, with vegetation structure and composition strongly influenced by topography, shallow soils, rocky outcrops/escarpments, and drainage features. The vegetation is generally characterised by a continuous to semi-continuous tussock grass layer across valley floors and gentler slopes, grading into a more patchy mosaic of grasses and low shrubs on rocky slopes and escarpment/cliff-associated terrain. Trees are largely absent in the assessed areas, and the overall structure is typical of a grassland-dominated system rather than woodland or thicket.

Within the assessed areas, the following habitat units are evident:

- Valley-floor and gentle-slope grasslands: broad open grassland areas with relatively continuous ground cover, providing the dominant “matrix” habitat and likely playing an important role in ecological connectivity between nodal infrastructure points across the landscape.
- Rocky slopes and escarpment-associated grassland/shrub mosaics: steeper terrain with exposed rock, shallow soils and patchy vegetation, where low shrubs become more prominent. These areas form distinct microhabitats and potential refugia for plant communities that maybe sensitive to physical disturbance and erosion.
- Drainage lines and riparian strips: localised zones associated with watercourses/drainage features (more apparent in summer), supporting denser grasses and wet-margin plant communities relative to adjacent slopes. These riparian features form linear habitat elements important for connectivity and are sensitive to sedimentation, bank disturbance and invasion.

Across the assessed footprint, the vegetation condition shows evidence of existing anthropogenic pressure typical of communal/rural mountain landscapes, including grazing influence, localised disturbance associated with tracks/access routes, and visible erosion features (including slope scars and gully/incipient channel formation in places). These pressures can reduce functional integrity in parts of the footprint and increase susceptibility to further erosion if construction disturbance is not strictly controlled and rehabilitated.

Notably, the site visits confirm the presence of alien/naturalised succulents, including *Opuntia* spp. (prickly pear) and *Agave* spp., which typically establish along disturbed areas and edges. Their presence indicates that alien plant incursions are already occurring in parts of the landscape and that construction disturbance could increase invasion risk if not managed through strict hygiene, topsoil handling and post-construction alien control.

Overall, the vegetation within the assessed BWSS footprint and receptor units can be described as a grassland-dominated system with rocky-slope and riparian habitat elements, varying from largely disturbed/grazed grassland and access-influenced zones to semi natural patchy rocky habitats. While the broader landscape is flagged as high sensitivity in the Screening Tool due to biodiversity planning layers and strategic catchment importance, the verified footprint areas reflect a mosaic of lower local sensitivity patches (disturbed/modified grassland) and moderate local sensitivity receptors (riparian strips and rocky/cliff-associated microhabitats). This supports a footprint-focused sensitivity interpretation, with emphasis on minimising disturbance, avoiding sensitive microhabitats where feasible, and implementing erosion and alien plant management measures during and after construction.

Plant species recorded on site were *Helichrysum caespititium*, *Themeda triandra*, *Anthospermum rigidum*, *Aristida adscensionis*, *Hermanthria altissima, Elionurus muticus*, *Aloe ferox*, *Vachellia karroo*, and *Rhus erosa.*

The overall plant diversity within the project area was considered low.

A list of plant species observed for the study is listed in Appendix A.

Figure 23: Aloe ferox

6.2. CONSERVATION STATUS OF BROAD VEGETATION TYPES

According to scientific literature (Driver et al., 2005; Mucina et al., 2006), the vegetation types are listed as Least Concern.

6.3. SPECIES OF CONSERVATION CONCERN

According to the IUCN Red data database, threatened species are species that are facing a high risk of extinction. Any species classified in the IUCN categories Critically Endangered, Endangered or Vulnerable is a threatened species.

Species of conservation concern are species that have a high conservation importance in terms of preserving South Africa's high floristic diversity and include not only threatened species, but also those classified in the categories Extinct in the Wild (EW), Regionally Extinct (RE), Near Threatened (NT), Critically Rare (CR), Rare (R), Declining and Data Deficient - Insufficient Information (DDD) (SANBI, 2012). If a subpopulation of a species of conservation concern is found to occur on a proposed development site, it would be one indicator that development activities could result in significant loss of biodiversity, bearing in mind that loss of subpopulations of these species will either increase their extinction risk or may in fact contribute to their extinction (see Figure 24). A description of the different SANBI categories of species of conservation concern is provided in Figure 24, below. The following categories are described below:

- **Extinct in the Wild (EW**) - A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
- **Regionally Extinct (RE)** - A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
- **Critically Endangered (CR**): A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction.

- **Endangered (EN):** species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
- **Vulnerable (VU):** A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
- **Near Threatened (NT)** - A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
- **Critically Rare -** A species is Critically Rare when it is known to occur at a single site but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.
- **Rare** – A species is rare when species are uncommon, scarce or infrequently encountered.
- **Declining**- A taxon is declining when species are decreasing in numbers.
- **Data Deficient - Insufficient Information** (DDD) - A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required and that future research could show that a threatened classification is appropriate.
- **Data Deficient –** Taxonomically Problematic (DDT): A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- **Least Concern (LC):** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.

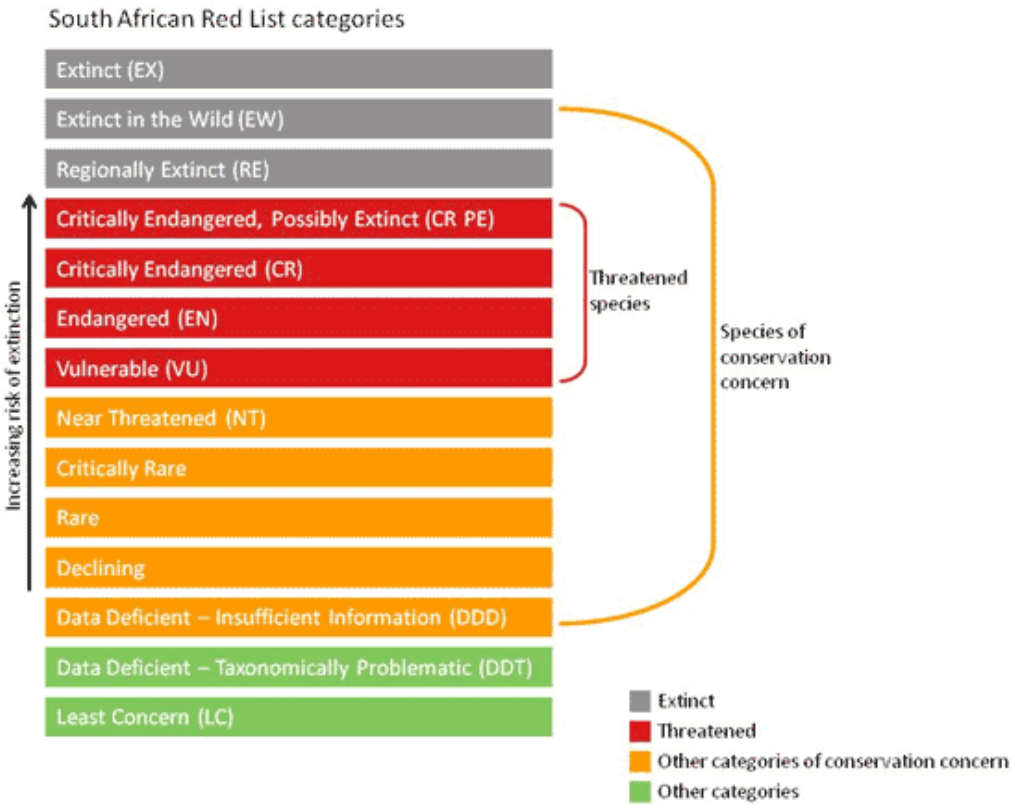


Figure 24: Threatened species categories (SANBI, 2020a).

6.3.1. PROBABILITY OF PLANT SPECIES OF CONSERVATION CONCERN

Several data sources exist to identify the location of SCCs. The Threatened Species Programme (TSP) has a database of locations of SCCs. This is based on herbarium records, as well as recent searches by experts, and volunteer programmes such as the Custodians of Rare and Endangered Wildflowers (CREW). iNaturalist, a citizen science electronic platform for posting pictures of species to be identified by experts, is also a source.

The Probability of Occurrence (PoO) is rated according to the availability of suitable habitat (Table 11), and whether the species has been previously recorded in the general vicinity of the assessed area. Data for habitat requirements was based on the species descriptions of the Red List (SANBI, 2020b). The Probability of Occurrence was rated as:

Table 11: Criteria for Determining the Probability of Species Occurrence.

Probability of Occurrence	Description
Low	No suitable habitat or confirmed records of the species occur within the proposed area of influence (PAOI), and targeted searches for easily identifiable species yielded no observations.
Medium	Unclear/unknown habitat requirements are but species recorded within 20 kms of PAOI; or degraded habitat occurs within PAOI; or habitat occurs within PAOI but no identification records within the vicinity of the PAOI
High	Suitable habitat occurs within the PAOI, and the species has been recorded nearby.
Confirmed	Species was identified within the PAOI

The web-based Screening Tool identified three plant Species of Conservation Concern (SCCs) with a medium sensitivity rating, indicating that the site may contain modelled habitat for threatened species. However, according to the NEWPOSA, there are no confirmed (recorded) or predicted (modelled) SCC occurrences within the proposed development footprint, beyond those flagged by the Screening Tool. This suggests that, apart from the Screening Tool predictions, there is no additional evidence of SCCs expected or known to occur in the area.

6.4. SPECIES OF CONSERVATION CONCERN POTENTIALLY OCCURRING ON SITE

After uploading the project area onto the National Web-Based Environmental Screening Tool, a list of potentially occurring and confirmed Species of Conservation Concern (SCC) was generated. In addition, the NEWPOSA database was consulted, which indicated that no SCC are expected to occur within the project area. During the site visit, no plant SCC were recorded. Several SCCs have been flagged by the Screening Tool as potentially occurring in the area (Table 12).

Table 12: List of plant species of conservation concern (scc) that have been identified as possibly occurring within the footprint of the proposed BWSS.

FAMILY	SPECIES NAME	THREATENED STATUS	SCREENING REPORT PoO	HABITAT REQUIREMENTS	PROBABILITY OF OCCURRENCE (field-verified)	REASON
Orchidaceae	*Pterygodium alticola* (Parkman & Schelpe) J.C.Manning & Goldblatt	Rare	Medium	Damp grassland, 1 950–2 400 m	Low	Drainage channels and rivers occur in parts of the PAOI; however, the species is associated with damp grassland (e.g., seeps, wet hollows, wetland-margin grassland). No such damp grassland habitat was confirmed within the assessed footprint/PAOI during winter and summer surveys, and the species was not observed. No confirmed records were identified from reviewed sources.
Fabaceae	*Calpurnia reflexa* A.J.Beaumont	Rare	Medium	Ravines / bushy kloofs above ±1 800 m	Low	While drainage features occur, the species typically requires ravines/bushy kloofs (dense woody vegetation in sheltered gullies). This habitat type was not confirmed within the assessed footprint/PAOI in a form consistent with the species requirement, and the species was not observed. No confirmed records were identified from reviewed sources.
Hyacinthaceae	Sensitive species 1248 (withheld)	Vulnerable	Medium	Low–medium altitudes; mountain ranges; thickly vegetated river valleys; under bush clumps; boulder screes; steep rocky hills; shaded situations	Medium	Drainage channels/rivers and valley features are present in parts of the PAOI, and the described habitat envelope overlaps with vegetated river valleys, shaded rocky slopes, and boulder screes/rocky microhabitats that may occur locally. The species identity is withheld and no confirmed records/observations were available; therefore PoO is retained as Medium (precautionary) pending SANBI disclosure and/or pre-construction microhabitat checks.

6.5. THREATENED OR PROTECTED SPECIES

The following legislation was consulted to determine whether a species is protected by Legislation:

- National Environmental Management: Biodiversity Act 10 of 2004 – Regulations pertaining to Threatened or Protected Terrestrial Species and Freshwater Species (GNR 3009 of 2023);
- Nature and Environmental Conservation Ordinance of 1974; and
- National Forests Act No. 84 of 1998 – List of Protected Trees (published 8 September 2017).

The plant species recorded on site are all classified as Least Concern according to the SANBI Red List. None are listed as protected or threatened under national or provincial conservation legislation. The presence of these species is characteristic of the Senqu Montane Shrubland and Zastron Moist Grassland vegetation types with no Species of Conservation Concern (SCCs) recorded during the survey.

6.6. ALIEN INVASIVE PLANTS

Concern is growing over the way in which alien/exotic plants are invading large areas within South Africa. Invasive species are a major threat to the ecological functioning of natural systems as well as the productive use of the land and should ideally be removed if they are serving no ecological function.

Alien and invasive plant species were identified within the project site. These plants are classified according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004). In terms of the amendments to the regulations under the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014, landowners are legally responsible for the control of invasive alien plants on their properties. In the study area, the historical and current disturbance of the natural habitat for land use has promoted the invasion of alien plant species. There were alien species observed on site.

NEMBA Categories

There are currently three categories that declared weeds and invaders have been categorised into (Henderson, 2001):

- Category 1 plants are prohibited and must be controlled;
- Category 2 plants (commercially used plants) may be grown in demarcated areas proving that there is a permit and that steps are taken to prevent their spread; and
- Category 3 plants (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading there of, except within the flood line of watercourses and wetlands.

Table 13: List of invasive alien species (IAS) on site.

Species	Category
Acacia mearnsii De Wild	2
Agave sisalana Perrine	2
Arundo donax L.	1b
Opuntia spp.	1b
Eucalyptus camaldulensis	2
Solanum elaeagnifolium	1b
Cirsium vulgare	2
Arundo donax	1b

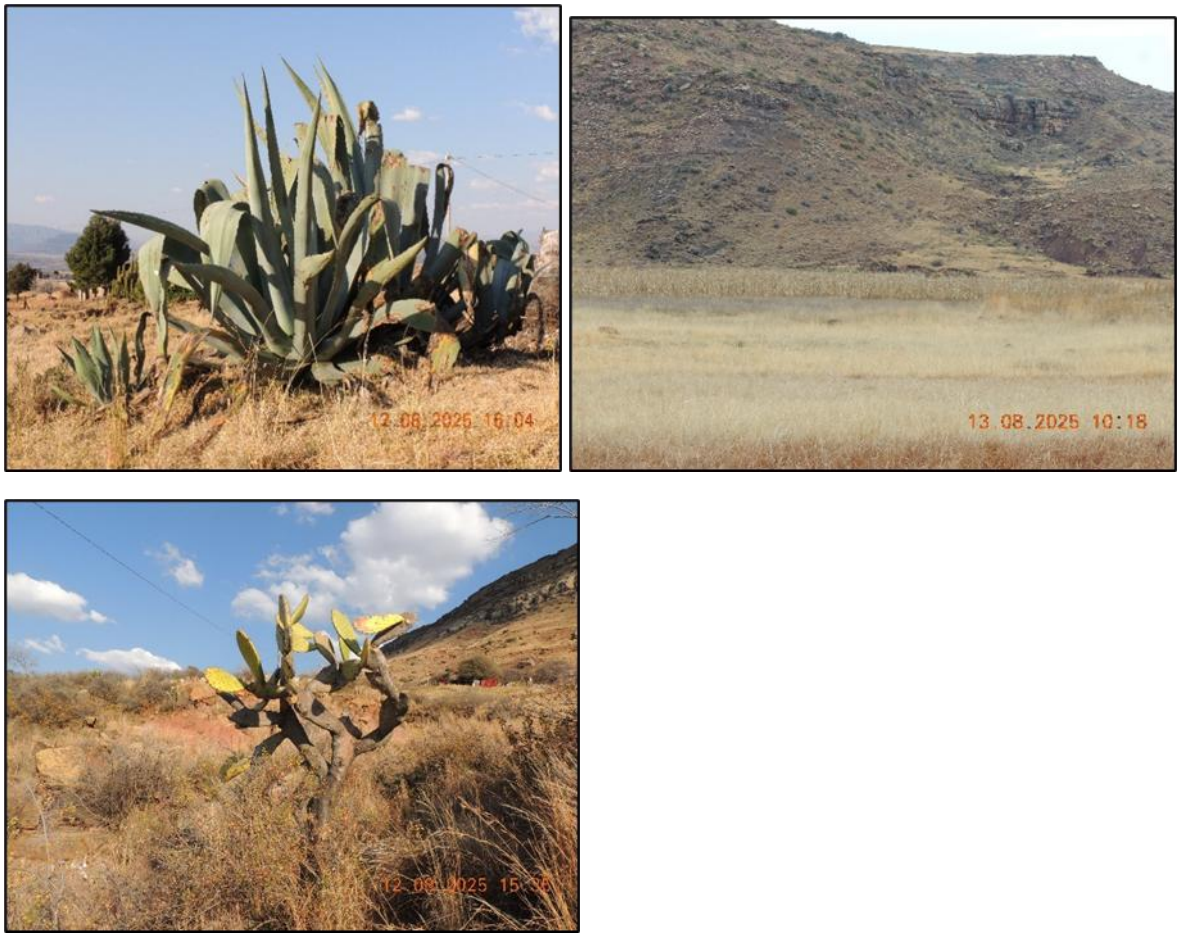


Figure 25: Examples of invasive alien plant species recorded on site (Left) *Agave* spp; (Right) *Arundo donax*; (Bottom left) *Opuntia* spp.

7. FAUNA

There is a general lack of pristine terrestrial habitats in the Eastern Cape region. This means that some components of the terrestrial fauna have been severely impacted by previous human activity, particularly the loss of vegetation, invasion of alien vegetation, local extinction of large mammals, and varied industrial developments.

Animals play an important role in maintaining ecosystem functioning for example pollination, spreading of seeds, removing of pests, forming part of a specific food chain, trimming of vegetation and therefore determining penetrability of vegetation and generation of manure etc.

Grassland vegetation, forming part of the Grassland Biome, is dominated by perennial grasses with a high diversity of forbs and geophytes, and is maintained by seasonal rainfall, fire, grazing, and frost. These ecosystems are ecologically vital to animal communities, as they provide primary forage for herbivores, habitat for ground-nesting birds and small mammals, and support diverse insect populations that sustain higher trophic levels. The open structure of grasslands facilitates predator–prey interactions, while the dense root systems improve soil stability and nutrient cycling, indirectly benefiting burrowing fauna and invertebrates. Intact grasslands therefore play a crucial role in maintaining biodiversity, ecosystem functioning, and overall ecological resilience.

Details of fauna observed will be found in the animal species assessment report.

7.1. AMPHIBIANS AND REPTILES

Amphibians and reptiles are well represented in sub-Saharan Africa. However, distribution patterns in southern Africa are uneven both in terms of species distribution and in population numbers (du Preez and Carruthers, 2009). Climate, centres of origin and range restrictions are the three main factors that determine species distribution. The eastern coast of South Africa has the highest amphibian diversity and endemicity while reptile diversity is generally highest in the northeastern extremes of South Africa and declines to the south and west (Alexander and Marais, 2010).

7.1.1. REPTILES

South Africa has approximately 350 species of reptiles, comprising 213 lizards, 9 worm lizards, 105 snakes, 13 terrestrial tortoises, 5 freshwater terrapins, 2 breeding species of sea turtle and 1 crocodile (Branch, 1998). Of those, the Eastern Cape is home to 133 which include 21 snakes, 27 lizards and eight chelonians (tortoises and turtles). The majority of these are found in Mesic Succulent Thicket and riverine habitats. The Southern Rock Agama (*Agama atra*) was spotted during the site surveys.

7.1.2. AMPHIBIANS

Amphibians are important in wetland systems, particularly where fish are excluded or of minor importance. In these habitats, frogs are dominant predators of invertebrates. Frog abundance and diversity is a poignant reflection of the general health and well-being of aquatic ecosystems.

On the day of inspection, tadpoles of the common river frog (*Amietia delalandii*) were spotted in the Blikana River. The site has not been highlighted as a particularly important area for the conservation of amphibian species such as frogs, with no known endemics or threatened species highlighted for the project site. Amphibians are often associated with specific microhabitats or patches (hygrophytic or aquatic ephemerophytic grass and sedge dominated temporary pans). Emphasis must be placed on remaining natural open grassland habitats (important migratory and foraging areas) as well as seasonal wetlands (drainage and marshland vegetation) in an area.

7.1.3. MAMMALS

No small mammal trapping was conducted. Fieldwork was augmented with previous surveys in similar habitats as well as published data. It is unlikely that any large mammals remain in the area due to

human settlement around the site. Mammals that still occur in the area are likely to be limited to small (e.g., rodents). The *Ovis aries, Equus caballus* and *Bos taurus* were the only mammal spotted on site during the field survey.

7.1.4. AVIFAUNA

There are 62 threatened bird species within the Eastern Cape Province (Barnes, 2000). Most of these species occur in grasslands or are associated with wetlands, indicating a need to conserve what is left of these ecosystems (Barnes, 2000). Some birds were observed including the Red-eyed Dove (*Streptopelia semitorquata*) and Yellow Canary *(Crithagra flaviventris*).

7.1.5. INVERTEBRATES

There is generally very little available long-term information on invertebrate species and populations for most of South Africa, with no known available information on Red Data invertebrates for the study area to enable the assessment of potential occurrence. The African Monarch (*Danaus chrysippus*) was observed during the site assessment.

8. ECOLOGICAL SENSITIVITY AND SITE ECOLOGICAL IMPORTANCE

Ecological sensitivity and Site Ecological Importance (SEI) for the BWSS footprint and PAOI were derived by identifying the key biodiversity and conservation planning priorities applicable to the site through a desktop assessment, and then verifying habitat condition, disturbance and receptor presence during field surveys. The desktop assessment considered the following conservation tools and planning layers:

- the National Web-Based Environmental Screening Tool outputs;
- relevant provincial biodiversity planning layers (including Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs) and Protected Areas (PAs)); and
- the National Environmental Management: Biodiversity Act (NEMBA) threatened ecosystem listings (where applicable).

Desktop interpretation of the terrestrial biodiversity context indicates that the proposed development footprint occurs within two mapped vegetation types, namely Senqu Montane Shrubland and Zastron Moist Grassland. Both vegetation types are classified as Least Concern in the National Red List of Ecosystems and are therefore not listed as threatened ecosystem types at national scale. The vegetation types are also not themselves Protected Areas in terms of the National Environmental Management: Protected Areas Act.

Notwithstanding the above, the broader landscape context is identified as ecologically important by biodiversity planning layers. The BWSS footprint occurs within a Terrestrial CBA2 and within Ecological Support Areas (ESA1 and ESA2), which indicate areas required to support ecological processes and maintain landscape connectivity. In addition, the development area lies within the Eastern Cape Drakensberg Strategic Water Source Area (SWSA) and within a Freshwater Ecosystem Priority Area (FEPA) sub-catchment, highlighting the functional importance of the landscape for sustaining regional water resources and freshwater-linked biodiversity. Accordingly, while the mapped vegetation types are not classified as threatened ecosystem types, the site's location within CBA/ESA planning layers and within the Eastern Cape Drakensberg SWSA and FEPA context means that ecological process and connectivity considerations are critical and must be addressed through footprint discipline, micro-siting where feasible, and appropriate mitigation.

SEI is calculated for habitat/receptor units within the PAOI (e.g., riparian/drainage corridors, rocky/cliff-associated habitats, and the disturbed valley/settlement matrix) by assigning CI, FI and RR and deriving BI and SEI using the guideline matrices. The resulting receptor-unit SEI ratings are then applied spatially to BWSS infrastructure components according to which receptor(s) they intersect, with the highest SEI treated as the controlling sensitivity at cliff and watercourse interfaces.

Most components fall into three main receptor/habitat units:

1. Cliff face / rocky escarpment habitat (highly sensitive microhabitat; difficult to rehabilitate)
2. Valley-floor grassland + settlement-influenced matrix (generally lower local integrity, but still important for connectivity)
3. Riparian corridors / riverbank habitat (high functional importance; sensitive to erosion/sedimentation)

Table 14: SEI evaluation of habitat units in the BWSS PAOI (Species Environmental Assessment Guideline v3.1, 2022).

Infrastructure component	Location summary	Receptor(s) intersected	SEI class	Justification
CR1 (Command Reservoir 1)	On cliff face	Cliff/rock	Medium	Rocky/cliff microhabitat has elevated sensitivity and low rehabilitability; precautionary Medium applied for plant SCC microhabitats despite no SCC observed.
CR2 (Command Reservoir 2)	On cliff face	Cliff/rock	Medium	Cliff/rock receptor is a specialised microhabitat and difficult to restore; precautionary Medium SEI applied.
CR2 rising/gravity main	Cliff face → valley near settlements	Cliff/rock + valley/settlement	Medium (cliff sections); Low (valley sections)	Cliff sections intersect sensitive rocky microhabitats (Medium). Valley/settlement sections are already disturbed and have lower local integrity (Low).
CR3 (Command Reservoir 3)	On cliff face	Cliff/rock	Medium	Direct interaction with cliff/rock receptor; disturbance consequence is higher than valley areas.
CR3 rising main	Cliff face → settlement valley → near river	Cliff/rock + valley/settlement + riparian	Medium (cliff + riparian); Low (valley)	Medium where line intersects cliff/rock and riparian receptors (functional importance/erosion sensitivity). Low through settlement-influenced valley sections.
CR3 gravity main	Cliff face → settlement → ends near river	Cliff/rock + valley/settlement + riparian	Medium (cliff + riparian); Low (valley)	Mixed receptors; sensitivity elevated near cliff/rock and river interface; lower in disturbed valley matrix.
Proposed dam	Near river, valley floor	Riparian/ riverbank habitat	Medium	Near river/riparian receptor; sensitive to erosion, sedimentation and altered hydrology; high functional importance.
C-B1 (Abstraction point 1)	Valley floor on river	Riparian/ riverbank habitat	Medium	Watercourse interface elevates sensitivity due to bank stability and water-quality pathways.
C-B2 (Pick-up weir / abstraction point 2)	Valley floor within river	Riparian/river bank habitat	Medium	In-channel/riparian works are inherently more sensitive and require strict controls.

Infrastructure component	Location summary	Receptor(s) intersected	SEI class	Justification
WTW	Valley floor near river	Valley matrix (plus riparian influence	Low	Generally in disturbed valley-floor matrix (Low). Sensitivity increases locally if encroaching into riparian management zone.
C-B2 gravity main to WTW	Valley floor near river	Valley matrix + riparian influence	Low (general); Medium at river-adjacent segments/crossings	Most of the route is within disturbed valley matrix (Low); near-water sections elevate sensitivity (Medium).
SR2 rising main (inaccessible)	Valley floor near river → mountain tops; crosses watercourse	Valley matrix + rocky slopes + riparian crossing	Medium at crossing/rocky sections; Low in valley sections	Watercourse crossing and steep rocky terrain increase sensitivity (erosion risk; specialised microhabitats). Valley sections remain lower sensitivity.
SR1–CR1 rising mains from WTW tie-in	Valley floor near river; ends on cliff face	Valley matrix + riparian influence + cliff/rock	Medium at riparian and cliff; Low elsewhere	Sensitivity elevated where line runs near river and terminates on cliff/rock receptor; otherwise in disturbed valley matrix.
SR1 rising main (mid)	Valley floor → hill → valley through settlement	Valley/settlement matrix	Low	Settlement-influenced, grazed and disturbed matrix; lower local integrity and higher recoverability relative to cliff/riparian receptors.
SR1 rising main end	Cliff face → valley through settlements; ends near watercourse	Cliff/rock + valley/settlement + riparian	Medium at cliff and near-water; Low elsewhere	Medium at cliff/rock and near-water receptor intersections; low through settlement/disturbed valley.
CR1 gravity main	Hilltop → valley; crosses watercourse	Valley/settlement + riparian crossing	Medium at crossing; Low elsewhere	Watercourse crossing elevates sensitivity (bank stability/sediment pathway). Remaining alignment is in disturbed matrix.

9. IMPACT ASSESSMENT

9.1. POTENTIAL IMPACTS

The primary terrestrial biodiversity impacts associated with the BWSS relate to the disturbance and loss of natural vegetation and habitat, and the potential for localised fragmentation of habitat connectivity within the development footprint and Project Area of Influence (PAOI). While the overall extent of impact is expected to be largely footprint-limited (given the linear and nodal nature of the infrastructure), sensitivity is not uniform and impacts may be elevated where infrastructure intersects riparian corridors/drainage lines (erosion/sedimentation and riparian habitat integrity pathways) and rocky outcrops/cliff-associated microhabitats (specialised habitat and low rehabilitability). In addition, construction disturbance may increase the risk of erosion on steep slopes and facilitate alien invasive plant establishment along disturbed edges and access routes. Recommendations are provided below to avoid or minimise impacts in sensitive receptor areas and to ensure effective rehabilitation and ongoing management.

9.1.1. CONSTRUCTION PHASE IMPACTS

9.1.1.1. DIRECT IMPACTS

i. Loss of indigenous vegetation and SCC

The proposed development, including site preparation, access roads, pipeline trenching, and the dam footprint, will result in the loss of natural grassland and associated habitat. In addition, some cultivated land currently used by local villagers will be lost, together with grazing resources for livestock such as cattle and sheep. Construction activities will also lead to topsoil removal and compaction, with associated risks of altered surface hydrology, soil disturbance, and increased erosion. Disturbance from noise and vibration is expected to affect both wildlife and the nearby community. The affected vegetation units comprise Senqu Montane Shrubland and Zastron Moist Grassland, both classified as *Least Concern* vegetation types. However, the development footprint overlaps with areas mapped as Ecological Support Areas (ESA 1 and ESA 2) and a Critical Biodiversity Area 2 (CBA 2) and further falls within a FEPA sub-catchment and the Eastern Cape Drakensberg Strategic Water Source Area (SWSA). These spatial biodiversity and water resource planning layers significantly elevate the ecological sensitivity of the site, as they are critical for maintaining catchment integrity, water security, and biodiversity connectivity. While the direct impacts are considered moderate based on vegetation status alone, the broader ecological and strategic importance of the location increases the significance of potential impacts.

Table 15: Potential impacts of the construction phase - loss of vegetation.

<table>
<tr><td colspan="5">Impact: Direct loss of indigenous vegetation and SCC</td></tr>
<tr><td></td><td colspan="2">PHASE</td><td colspan="2">CONSTRUCTION</td></tr>
<tr><td></td><td colspan="2">TYPE</td><td colspan="2">NEGATIVE, DIRECT, CUMULATIVE</td></tr>
<tr><td></td><td colspan="2">SIGNIFICANCE</td><td colspan="2">WITH MITIGATION</td></tr>
<tr><td>EXTENT</td><td>1</td><td rowspan="4">Medium (44)</td><td>1</td><td rowspan="4">Medium (36)</td></tr>
<tr><td>DURATION</td><td>4</td><td>4</td></tr>
<tr><td>MAGNITUDE</td><td>6</td><td>4</td></tr>
<tr><td>PROBABILITY</td><td>4</td><td>4</td></tr>
<tr><td>Irreplaceable Loss</td><td colspan="4">Resource will be lost</td></tr>
<tr><td>Reversibility</td><td colspan="4">Irreversible</td></tr>
<tr><td>Impact Significance</td><td colspan="4">Medium</td></tr>
<tr><td>MITIGATION:</td><td colspan="4">• Minimise natural vegetation clearance: Limit the footprint of disturbance by maximising the use of existing tracks, roads, and infrastructure corridors wherever possible.
• Environmental supervision: Appoint a competent Environmental Control Officer (ECO) for the construction phase to ensure all recommendations in this report are implemented.
• Restrict access: Limit all construction and maintenance access to demarcated areas to prevent disturbance to vegetation outside the development footprint.
• Protect natural resources: Prohibit collection of plants, wood, or other natural resources outside the approved development footprint.
• Laydown areas: Restrict laydown, storage, and temporary work areas to sites of low ecological sensitivity to reduce unnecessary habitat loss.
• Selective clearing: Only clear vegetation that is essential for construction, such as for stringing pipelines or removing bushclumps, to minimise habitat loss.
• Topsoil management: Remove and stockpile topsoil carefully during construction for use in the rehabilitation of disturbed areas.
• Rehabilitation timing: Undertake rehabilitation immediately after construction activities cease in a given area to reduce erosion and promote ecosystem recovery.
• Rehabilitation methods: Allow mostly passive regeneration of vegetation, supplemented initially with indigenous grass mixes to stabilise soils and accelerate recovery.
• Protected species management: Apply for relevant permits prior to removing any protected species, and ensure removal is conducted in accordance with legal requirements.
• Long-term management: Develop an alien invasive plan Plan prior to operations, including monitoring and control of alien invasive species, ongoing vegetation management.</td></tr>
</table>

No Species of Conservation Concern (SCC) were confirmed during the site visit. The national screening tool identified three plant SCCs with medium sensitivity, indicating that the site may contain modelled habitat for threatened species. The vegetation was predominantly grassland, characterised by short grasses interspersed with scattered shrubs and occasional rocky outcrops. *Helichrysum caespititium, Themeda triandra, Anthospermum rigidum*, *Rhus erosa* and other plants were observed, along with alien *Agave* and *Opuntia* species.

Table 16: Potential risk of loss of SCC

<table>
<tr><th colspan="5">Impact: Direct loss of terrestrial plant SCCs and their habitat due to construction activities</th></tr>
<tr><td></td><td colspan="2">PHASE</td><td colspan="2">CONSTRUCTION</td></tr>
<tr><td></td><td colspan="2">TYPE</td><td colspan="2">NEGATIVE, DIRECT, CUMULATVE</td></tr>
<tr><td></td><td colspan="2">SIGNIFICANCE</td><td colspan="2">WITH MITIGATION</td></tr>
<tr><td>EXTENT</td><td>1</td><td rowspan="4">Medium (44)</td><td>1</td><td rowspan="4">Low (24)</td></tr>
<tr><td>DURATION</td><td>4</td><td>1</td></tr>
<tr><td>INTENSITY</td><td>6</td><td>4</td></tr>
<tr><td>PROBABILITY</td><td>4</td><td>4</td></tr>
<tr><td>Irreplaceable Loss</td><td colspan="4">No SCCs were recorded during the site visit; however, the national screening tool identified potential SCC habitat. Loss of undetected SCCs remains a precautionary concern.</td></tr>
<tr><td>Reversibility</td><td colspan="4">Potentially irreversible if SCCs are present but undetected.</td></tr>
<tr><td>Mitigation Potential</td><td colspan="4">Moderate</td></tr>
<tr><td>MITIGATION:</td><td colspan="4">• Micro-siting / avoidance where possible: Finalise the layout to avoid high-risk SCC microhabitats where feasible (riparian margins/drainage lines/seeps; rocky ledges/boulder screes/shaded cliff niches; intact grassland patches).
• Targeted pre-construction walkdown: Specialist + ECO walkdown before clearing/trenching at all cliff/rock sections, riparian crossings/near-water works, and intact habitat patches to confirm microhabitats and refine no-go areas/buffers.
• Demarcation and footprint discipline: Peg/tape the approved corridor and work areas; prohibit widening, parallel tracks and off-road driving; keep laydowns/stockpiles and refuelling in approved disturbed areas only.
• Stop-work trigger: If any suspected SCC (or unknown plant matching SCC traits) is encountered, stop work, demarcate, and obtain specialist confirmation and buffer instructions before continuing.
• Riparian + erosion control: Maintain riparian management buffers where feasible; minimise and tightly control crossings; implement erosion/sediment controls (staged clearing, stabilisation, silt measures) and rehabilitate banks/slopes immediately after works.
• Rehabilitation + alien control + monitoring: Progressive rehabilitation with correct topsoil handling where applicable, plus alien invasive plant control along disturbed edges and access routes; ECO to monitor compliance and</td></tr>
</table>

	keep an SCC encounter log (including GPS/photo records and database submission if SCC are confirmed).

ii. Loss of Ecosystem Function and Connectivity

The proposed development, including site preparation, access roads, pipeline trenching, and the dam footprint, is expected to affect the ecological function and connectivity of the remaining natural grassland within the project footprint. The development area overlaps with Ecological Support Areas (ESA 1 and ESA 2) and Critical Biodiversity Area 2 (CBA 2) and also falls within a FEPA sub-catchment and the Eastern Cape Drakensberg Strategic Water Source Area (SWSA), elevating the ecological sensitivity of the site. The footprint will result in further fragmentation of the natural grassland, which can disrupt key ecosystem processes such as seed dispersal, pollination, and natural fire dynamics, ultimately reducing ecosystem functionality. Impacts from herbivory are expected to be minimal, as large herbivores are largely absent; however, ongoing edge effects and infrastructure may further restrict the movement of remaining fauna and limit natural regeneration processes. Notwithstanding, surrounding areas retain patches of moderately intact grassland that continue to provide some degree of ecological connectivity. Minimising vegetation clearance within the development footprint and protecting adjacent natural areas will therefore be essential to maintain ecological linkages and buffer against cumulative impacts.

Table 17: Potential impact of loss of ecosystem functioning.

<table>
<tr><th colspan="5">Impact: Loss of Ecosystem function and connectivity</th></tr>
<tr><td></td><td colspan="2">PHASE</td><td colspan="2">CONSTRUCTION</td></tr>
<tr><td></td><td colspan="2">TYPE</td><td colspan="2">NEGATIVE, DIRECT</td></tr>
<tr><td></td><td colspan="2">SIGNIFICANCE</td><td colspan="2">WITH MITIGATION</td></tr>
<tr><td>EXTENT</td><td>2</td><td rowspan="4">Medium (40)</td><td>1</td><td rowspan="4">Low (24)</td></tr>
<tr><td>DURATION</td><td>4</td><td>3</td></tr>
<tr><td>INTENSITY</td><td>4</td><td>4</td></tr>
<tr><td>PROBABILITY</td><td>4</td><td>3</td></tr>
<tr><td>Irreplaceable Loss</td><td colspan="4">Resource will be partly lost</td></tr>
<tr><td>Reversibility</td><td colspan="4">Moderately reversible</td></tr>
<tr><td>Mitigation Potential</td><td colspan="4">Moderate</td></tr>
<tr><td>MITIGATION:</td><td colspan="4">• Protect key ecological processes and corridors (avoidance/micro-siting): Micro-site the footprint to avoid or minimise disturbance in riparian corridors, drainage lines, wet areas, and connectivity pinch points (valley bottoms, narrow passes, ridgelines) that maintain landscape function.
• Maintain habitat connectivity (footprint discipline): Keep all disturbance within a single, clearly demarcated corridor; avoid parallel tracks; reinstate/close temporary access routes after construction to prevent long-term fragmentation and edge effects.</td></tr>
</table>

	• Erosion, stormwater and sediment control (process protection): Implement robust erosion and stormwater controls on slopes and at crossings (staged clearing, diversions/berms, silt measures, rapid stabilisation). Prevent sediment delivery to riparian systems to protect downstream functioning. • Topsoil and rehabilitation to restore function: Strip, store and re-spread topsoil (where applicable) to reinstate soil seedbank and microbial function; rehabilitate progressively; stabilise disturbed ground and re-vegetate to restore groundcover, infiltration and productivity. • Alien invasive species prevention and control: Apply hygiene measures and active invasive control along disturbed edges and access routes to prevent replacement of indigenous communities and long-term functional decline.

iii. Disturbance of the surface resulting in increased risk of AIPs

Clearing for the construction phase of the project will result in soil disturbance and reduced cover of indigenous vegetation, greatly increasing the chance of the establishment of alien invasive plants (Table 18). Several species, including the succulent *Opuntia* spp. and *Agave* spp. are likely to invade the disturbed areas.

Table 18: Potential risk of spread and invasion of AIPs

IMPACT	**Natural vegetation is negatively affected by the increased risk of invasion by AIPs due to the construction of the bulk water system**				
NATURE	NEGATIVE		TYPE	DIRECT, CUMULATIVE	
PHASE	CONSTRUCTION	**SIGNIFICANCE**		**WITH MITIGATION**	
Construction	EXTENT	2	Medium (30)	2	Insignificant (8)
	DURATION	2		1	
	INTENSITY	6		1	
	PROBABILITY	3		2	
	Irreplaceable Loss	Moderate loss			
	Reversibility	High reversibility			
	Mitigation Potential	High			
	MITIGATION:	• Minimise disturbance and keep to demarcated footprint: Strict footprint demarcation, no parallel tracks, and minimal vegetation clearing reduce new disturbed “recruitment zones” for AIPs. • Topsoil and spoil management: Strip and store topsoil separately (where applicable), avoid mixing topsoil with subsoil/spoil, and prevent moving contaminated soil from invaded areas into clean areas. • Active AIP control during construction: Implement immediate control/removal of AIPs encountered within the footprint and along access routes (method appropriate to species—mechanical removal, targeted			

		herbicide by a qualified operator, and safe disposal). Prevent dumping of cut material in the veld. • Rehabilitation and follow-up monitoring: Rehabilitate progressively to re-establish indigenous groundcover quickly, and implement follow-up AIP monitoring and control for at least one growing season (longer in riparian and high-risk disturbed areas), with ECO inspections and corrective actions.

9.1.2. OPERATIONAL PHASE IMPACTS

9.1.2.1. DIRECT IMPACTS

i. Increase in Anthropogenic Disturbance

The operation of the development will result in increased anthropogenic influences on the surrounding natural vegetation, specifically Zastron Moist Grassland and Senqu Montane Shrubland. These impacts may manifest as edge effects, including increased disturbance, littering, and plant collection, which could lead to further loss or disruption of species and ecosystem processes on site. Other disruptive activities such as dumping, clearing of natural vegetation, overgrazing, and the creation of uncontrolled footpaths may also increase the risk of invasion by Invasive Alien Plants.

Table 19: Potential risk of increased anthropogenic disturbances

IMPACT	**Direct Increase in Anthropogenic Disturbance during operation of the developed area**				
NATURE	NEGATIVE		TYPE	DIRECT, CUMULATVE	
PHASE		SIGNIFICANCE		WITH MITIGATION	
Operation	EXTENT	2	Medium (30)	2	Low (20)
	DURATION	2		1	
	INTENSITY	6		2	
	PROBABILITY	3		2	
	Irreplaceable Loss	Moderate loss			
	Reversibility	High reversibility			
	Mitigation Potential	High			
	MITIGATION:	• Controlled access and route management: Restrict access to BWSS infrastructure to authorised personnel only; use locked gates where feasible and keep maintenance vehicles to designated routes (no off-road driving or creation of new tracks). • Maintenance scheduling to minimise disturbance: Plan routine maintenance during daylight hours and limit frequency/duration of visits, especially near cliff/rock receptors and riparian corridors. Avoid sensitive periods if any breeding/roosting use is confirmed. • Lighting management (where lighting is required) :Minimise permanent lighting; use downward-shielded,			

		motion-activated lighting only where needed for safety/security and avoid directing light toward cliffs and riparian corridors. • Noise and activity controls: Enforce quiet operations (no unnecessary idling, revving, or horn use), restrict use of generators to essential needs, and maintain equipment to reduce noise. • Housekeeping and waste control: Maintain strict waste management (no food waste/carcasses, secure bins, regular removal) to avoid attracting animals and increasing human-wildlife interaction around facilities. • Monitoring and incident response: ECO/operations staff to periodically inspect for new informal access paths, litter, erosion, or signs of wildlife disturbance; implement corrective actions (close routes, rehabilitate disturbed areas, adjust access controls) and update procedures if repeated issues occur. • No fires should be allowed on site.

9.1.3. CUMULATIVE IMPACTS

Although parts of the proposed BWSS footprint occur within a moderately disturbed rural landscape, the surrounding area contains patches of intact to moderately intact natural vegetation, including Zastron Moist Grassland and Senqu Montane Shrubland, which continue to support ecological functioning and connectivity. The BWSS, when considered together with ongoing small-scale rural land uses (e.g., unmanaged grazing pressure, informal access, and small-scale clearing), may contribute to cumulative impacts through incremental loss of habitat functionality, increased edge effects and fragmentation, elevated erosion/sedimentation risk along drainage features, and an increased likelihood of alien invasive plant spread along disturbed corridors. These pressures are generally localised, but may be exacerbated over time if new access routes, disturbed verges and rehabilitated areas are not effectively managed.

The footprint occurs within or adjacent to biodiversity and ecosystem-process priority layers, including ESA1/ESA2, CBA2, a FEPA sub-catchment, and the Eastern Cape Drakensberg Strategic Water Source Area (SWSA), indicating high landscape-scale ecological and hydrological importance. Degradation of these support areas, if unmanaged, could incrementally undermine conservation targets and reduce ecological connectivity across the broader landscape. Cumulative impacts can be reduced through strict footprint discipline and access control, avoidance/micro-siting in sensitive receptors where feasible, progressive rehabilitation and erosion control, and ongoing alien invasive species control and ecological monitoring within and adjacent to the project footprint.

With the implementation of the proposed mitigation and management measures (strict footprint and access control, erosion/sediment controls at drainage features, progressive rehabilitation, and active alien invasive plant control), cumulative impacts are expected to remain localised and not materially undermine broader landscape connectivity or conservation targets. The residual significance of cumulative impacts is therefore assessed as Low.

Table *20*: Potential impact of cumulative loss of SCC and natural vegetation.

<table>
<tr><td>IMPACT</td><td colspan="5">Cumulative loss of natural vegetation and SCC due to clearing and habitat degradation</td></tr>
<tr><td>NATURE</td><td colspan="2">NEGATIVE</td><td>TYPE</td><td colspan="2">DIRECT, CUMULATVE</td></tr>
<tr><td>PHASE</td><td></td><td colspan="2">SIGNIFICANCE</td><td colspan="2">WITH MITIGATION</td></tr>
<tr><td rowspan="10">Construction
Operation</td><td>EXTENT</td><td>2</td><td rowspan="4">Medium (33)</td><td>2</td><td rowspan="4">Low (18)</td></tr>
<tr><td>DURATION</td><td>3</td><td>3</td></tr>
<tr><td>INTENSITY</td><td>6</td><td>4</td></tr>
<tr><td>PROBABILITY</td><td>3</td><td>3</td></tr>
<tr><td>Irreplaceable Loss</td><td colspan="4">Moderate loss</td></tr>
<tr><td>Reversibility</td><td colspan="4">Low reversibility</td></tr>
<tr><td>Mitigation Potential</td><td colspan="4">Moderate</td></tr>
<tr><td>MITIGATION:</td><td colspan="4">• Strict footprint discipline (prevent incremental widening) Demarcate the approved corridor and work areas; prohibit widening, parallel tracks, and off-road driving to prevent repeated incremental habitat loss over time.
• Access control and decommissioning of temporary routes Use a single controlled access route where feasible; close and rehabilitate temporary access tracks after construction to prevent long-term access creep and secondary disturbance.
• Micro-siting to avoid sensitive receptors and pinch points Apply micro-siting at final design and pre-construction stage to avoid repeated disturbance in riparian corridors, drainage crossings, seeps/wet areas, rocky/cliff microhabitats, and connectivity pinch points.
• Erosion/stormwater/sediment controls (protect catchment function)
Implement robust erosion and stormwater controls on slopes and at all crossings (staged clearing, stabilisation, silt measures, runoff diversion) to prevent cumulative sediment inputs into drainage lines and rivers.
• Progressive rehabilitation and reinstatement of vegetation cover
Rehabilitate disturbed areas progressively (not only at the end), reinstate topsoil where applicable, stabilise slopes, and re-vegetate to restore groundcover and reduce long-term functional loss.
• Alien invasive plant prevention and follow-up control control existing infestations; monitor disturbed edges and access routes; implement follow-up control for at least one growing season (longer near riparian zones).
• Construction and operational housekeeping Enforce waste control and tidy working areas to avoid attracting fauna and causing repeated disturbance; prevent dumping of spoil or vegetation in natural areas.
• Monitoring, auditing and adaptive management ECO to monitor compliance during construction and conduct post-construction follow-up checks (rehab success, erosion, alien spread, informal access). Implement corrective actions quickly (re-stabilisation, re-seeding, additional alien control, route closure).</td></tr>
</table>

9.1.4. NO-GO OPTION

Under the No-Go Option, the proposed bulk water supply scheme would not be implemented and the site would remain in its current condition. The area supports moderately intact indigenous vegetation representative of Senqu Montane Shrubland and Zastron Moist Grassland, with localised disturbance features including erosion and limited to localised invasion by alien/naturalised species (notably *Agave* spp., *Opuntia* spp., and *Arundo donax*).

In the absence of development, subsistence grazing by local communities would continue. Based on field observations, grazing at current levels is not at high levels; however, ongoing disturbance in the absence of active management may gradually exacerbate erosion and facilitate the spread of invasive species over time, particularly along drainage lines and disturbed edges.

From a socio-economic perspective, maintaining the status quo would mean that surrounding rural communities would continue to rely on existing water supply arrangements that are reported to be insufficient. As population and demand increase, the No-Go Option could result in increased reliance on local watercourses and informal abstraction points, with potential consequences for water quality and continued inequitable access to a safe and reliable water supply.

Overall, the No-Go Option would avoid direct project-related vegetation loss and habitat disturbance, but it would not address existing land-use pressures and would delay the delivery of essential water infrastructure, potentially intensifying pressure on local water resources in the longer term.

9.1.5. AREAS NOT SUITABLE FOR DEVELOPMENT (No-Go / Avoid / Restricted Zones)

The following areas are regarded as not suitable for general development and disturbance due to elevated sensitivity, functional importance and/or low resilience. Because the BWSS includes linear pipelines, some watercourse crossings are unavoidable; therefore, the “avoid” approach is applied as No-Go for ancillary disturbance, and Restricted Works Zones for unavoidable crossings.

A) No-Go / Avoid areas (apply across construction and operation)

- Riparian corridors and watercourse buffers (No-Go for ancillary works): Rivers, streams and drainage lines within the PAOI, including riparian vegetation and adjacent wet margins, must be treated as No-Go for construction support activities. No laydown areas, stockpiles, refuelling, batching, servicing, spoil placement, waste storage, or vehicle parking may occur within the riparian management buffer.
- Seeps, wet areas and wetland-margin habitats (where present): Any seep lines, wet hollows or wetland-margin grassland identified during field verification or pre-construction walkdown must be avoided, as these are sensitive moisture-driven habitats and potential SCC microhabitats.
- Rocky ledges, boulder screes and cliff-associated microhabitats (where practicable): Cliff faces/ledges, shaded rock crevices and boulder screes are sensitive microhabitats with low rehabilitability and potential plant SCC habitat. Disturbance should be avoided wherever feasible and, where engineering constraints require proximity, the footprint must be minimised and controlled.

B) Restricted Works Zones (where crossings are unavoidable)

- Watercourse crossing points (restricted and controlled only): Where pipelines must cross a watercourse/drainage line, works may occur only within a clearly demarcated, minimum-width crossing corridor and in accordance with an approved method statement. The crossing must be limited to the smallest feasible footprint and duration, and must include strict erosion/sediment controls and immediate rehabilitation of banks and disturbed riparian vegetation.

9.1.6. ASSESSMENT OF WTW SITE ALTERNATIVES

From a terrestrial biodiversity and vegetation perspective, the preferred WTW site is supported over Alternative 1. Although both sites are of low plant diversity and low ecological importance, the preferred site is located in a previously disturbed grazing/cultivation area, whereas Alternative 1 is associated with dongas and drainage lines that introduce additional erosion and disturbance constraints. The preferred WTW site is therefore considered the lower-risk option.

10.FAUNA MANAGEMENT PRINCIPLES

As the proposed project involves the construction of reservoirs, a dam and pipelines, the faunal impacts will largely be restricted to the construction phase. The two broad categories of impacts will be habitat loss and disturbance related to construction activities. Extensive habitat transformation and degradation within and immediately adjacent to the site should be prevented. Should there be any red data mammals, reptiles, amphibians or birds observed on site in future, the appropriate specialist should be consulted.

10.1. REPTILE MANAGEMENT MEASURES

Most reptile species are sensitive to severe habitat alteration and fragmentation. No reptile should be intentionally killed, caught or collected at any point in time. A team of trained reptile handlers must be called upon to handle and remove any reptiles found on site. The following are recommended reptile management measures:

- No termite mounds should be intentionally destroyed. Any lizards, geckos, agamids, monitors or snakes encountered should be allowed to escape to a suitable habitat away from the disturbance; and
- Educational programmes for the contractor's staff must be implemented to ensure that project workers are alerted to the possibility of snakes being found during vegetation clearance. The construction team must be briefed about the management of snakes in such instances.

10.2. MAMMALS AND AMPHIBIANS' MANAGEMENT MEASURES

The following mitigation measures are recommended:

- The clearing of vegetation must be kept to a minimum and remain within the footprint of the development;
- The construction must be completed as quickly as possible - no fauna species may be killed;
- During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled; and
- No specific recommendations are made for the protection of burrowing red data mammals. Consideration could be given to rescuing the animals where their burrows are found in advance of construction. This is not recommended as a general prescription since the chances of digging out live mammals are small.

10.3. MANAGEMENT MEASURES FOR BIRDS

The impacts on avifauna will occur during both the construction and operational phases. The two broad categories of impacts will be habitat loss and disturbance related to construction activities. The movement and activities of personnel on site and the associated noise, pollution and litter all having a negative effect on birds. Pollution associated with construction activities (e.g., fuel spills, use of cleaning chemicals) could have negative impacts on avifauna, particularly if such chemicals were to make their way into drainage lines, rivers and wetlands, even off-site.

- Avian habitat loss: An area of avian habitat might be destroyed during construction. The following management measures are recommended:
    - Provide adequate briefing for site personnel and residents;
    - Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO).
- Impact on birds due to disturbance associated with construction activities and with increased human presence in the area. The following are recommended:
    - Movement of construction vehicles and workers beyond the boundary of the site must be minimized. In addition, workers must be instructed to minimize disturbance of birds at all times, and steps must be taken to ensure that no illegal hunting occurs;
    - The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area.
- Pollution associated with construction or operational activities. The following management measures are recommended:
    - Great care must be taken that no pollutants or other waste pollute the area or enter local water systems during the construction or operational phases. Measures to rapidly deal with spills of fuel, cleaning chemicals or any other potential pollutants must be put in place before construction commences;
    - Construction workers must be suitably trained to deal with any such spills; and
    - Facilities to handle pollution and waste must be provided to residents.

11.IMPACT STATEMENT

An impact statement is provided in accordance with the NEMA EIA Regulations for the proposed Blikana Water Supply Scheme (BWSS).

The proposed development comprises bulk potable water supply infrastructure, including a dam, abstraction works (C-B1/C-B2 and pick-up weir), a water treatment works (WTW), command reservoirs (CR1–CR3), and associated rising and gravity pipelines within a rural mountainous setting near Blikana as part of a municipal bulk water supply programme. Due to the mountainous terrain, hydraulic requirements and constructability constraints, no materially different layout alternatives were developed; however, environmental optimisation is addressed through micro-siting and footprint minimisation within the preferred alignment.

The National Web-Based Environmental Screening Tool rates the Terrestrial Biodiversity Theme as Very High, driven by the site's location within the Eastern Cape Drakensberg Strategic Water Source Area (SWSA) and overlap with biodiversity planning layers including CBA2, ESA2, and a FEPA sub-catchment. These layers reflect the broader ecological and hydrological importance of the landscape for maintaining ecosystem processes and water-resource function.

Field verification (12–14 August 2025 and 31 January 2026) confirmed that the assessed footprint/PAOI supports indigenous vegetation representative of Senqu Montane Shrubland and Zastron Moist Grassland, both classified as Least Concern ecosystem types. Vegetation condition is variable, ranging from intact to moderately disturbed, with localised disturbance features including erosion and the presence of alien/naturalised invasive plants (notably *Agave* spp., *Opuntia* spp., and *Arundo donax*). These disturbances are localised and do not, in themselves, indicate widespread ecological collapse, but they increase sensitivity to additional disturbance if not managed.

The Screening Tool rates the Plant Species Theme as Medium sensitivity. No plant Species of Conservation Concern (SCC) were observed during field surveys; however, withheld plant triggers and seasonal detectability constraints mean that absence cannot be confirmed with absolute certainty. A targeted pre-construction walkdown of high-risk microhabitats (riparian margins/drainage lines/seeps and rocky/cliff-associated niches) is recommended to confirm the absence of plant SCC immediately prior to disturbance.

Based on habitat condition and receptor-based SEI assessment, the site reflects Low SEI across much of the valley-floor/settlement-influenced matrix, with localised Medium SEI associated with riparian/drainage features and rocky/cliff-associated habitats where infrastructure intersects these receptors. The proposed activities will result in localised transformation of vegetation within the construction footprint and potential disturbance near watercourses and steep/rocky terrain. These impacts require implementation of mitigation measures to manage footprint discipline, erosion and sedimentation control, riparian protection, progressive rehabilitation, and alien invasive plant management.

With full implementation of the recommended mitigation and EMPr measures, the residual terrestrial biodiversity impact of the BWSS is expected to be Low to Medium, with the most important controls applying at riparian/drainage interfaces and rocky/cliff-associated receptor areas. A biodiversity offset is not considered necessary, given the footprint-limited nature of the development, the essential service delivery purpose of the infrastructure, the absence of confirmed plant SCC during surveys, and the ability to manage residual impacts through avoidance/micro-siting and rehabilitation.

Based on the findings of this assessment, the BWSS is considered acceptable from a terrestrial biodiversity perspective and plant species perspective, provided that the mitigation and rehabilitation

measures are fully implemented and compliance is monitored through ECO oversight and adaptive management.

12.CONCLUSION

The Blikana Water Supply Scheme (BWSS) is proposed within a broader landscape identified by the National Web-Based Environmental Screening Tool as Very High terrestrial biodiversity sensitivity, reflecting the ecological and hydrological importance of the Eastern Cape Drakensberg Strategic Water Source Area (SWSA) and overlap with biodiversity planning layers (including CBA2, ESA2 and a FEPA sub-catchment). Site verification confirms that sensitivity is not uniform at footprint scale. Much of the valley-floor and settlement-influenced matrix within the assessed footprint/PAOI exhibits lower local integrity, while riparian/drainage features and rocky/cliff-associated microhabitats represent the key receptor areas where ecological function and sensitivity are elevated and where impacts require strict management.

No plant Species of Conservation Concern (SCC) were recorded during field surveys undertaken in August 2025 (winter) and January 2026 (summer). However, because the Screening Tool includes withheld plant triggers and plant detectability can be influenced by phenology and access constraints, a precautionary approach remains appropriate. A targeted pre-construction walkdown of higher-risk microhabitats (riparian margins/drainage interfaces/seeps and rocky/cliff niches) is therefore recommended immediately prior to vegetation clearance in these areas, together with a clear stop-work procedure should any suspected SCC be encountered.

The BWSS will result in localised vegetation transformation within the construction footprint and temporary disturbance associated with construction activities. The most important impact pathways for terrestrial biodiversity and plant habitat function are expected to occur at: (i) watercourse and drainage line interfaces/crossings, where erosion, sedimentation and riparian integrity risks are elevated; and (ii) rocky/cliff-associated sections, where microhabitats are difficult to rehabilitate and disturbance consequence is higher. Provided that the mitigation measures prescribed in this report are implemented—particularly strict footprint discipline and access control, riparian protection and crossing controls, erosion and sediment management, progressive rehabilitation, and alien invasive plant control—the residual impacts are expected to remain localised and manageable.

From a terrestrial biodiversity and vegetation perspective, the preferred WTW site is supported over Alternative 1. Although both sites are of low plant diversity and low ecological importance, the preferred site is located in a previously disturbed grazing/cultivation area, whereas Alternative 1 is associated with dongas and drainage lines that introduce additional erosion and disturbance constraints. The preferred WTW site is therefore considered the lower-risk option.

Accordingly, the BWSS is considered acceptable from a terrestrial biodiversity and plant species perspective, subject to full implementation of the EMPr and ECO oversight, incorporation of the pre-construction verification requirement for high-risk microhabitats, and review of this specialist report should the final design or construction methodology change materially (e.g., additional access routes, widened corridors, additional disturbance areas, or changes to crossing locations).

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14. APPENDIX A: LIST OF TERRESTRIAL PLANT SPECIES ON THE SITES

Species	Threat status
Helichrysum caespititium	LC
Themeda triandra,	LC
Anthospermum rigidum	LC
Aristida adscensionis	LC
Hermanthria altissima	LC
Elionurus muticus	LC
Aloe ferox	LC
Vachellia karroo	LC
Rhus erosa	LC
Tristachya leucothrix	LC
Gladiolus dalenii	LC
Ledebouria petiolata	LC
Hypoxis parvula	LC
Crassula	LC
Delosperma nubigenum	LC
Diospyros lycioides	LC
Chrysocoma ciliata	LC
Felicia filifolia	LC
Heteropogon contortus	LC
Passerina montana	LC
Felicia muricata	LC
Eriocephalus ericoides	LC
Pteronia incana	LC
Bulbostylis humilis	LC
Indigofera	LC
Hemarthria altissima	LC
Hyparrhenia hirta	LC
Seriphium vulgare	LC
Opuntia ficus indica	LC
Agave sisalana	LC
Arundo donax	LC
Acacia mearnsii	LC
Eucalyptus camaldulensis	LC
Solanum elaeagnifolium	LC
Cirsium vulgare	LC
Searsia erosa	LC