AQUATIC COMPLIANCE STATEMENT FOR THE PROPOSED CABLEWAY IN FRANSCHHOEK

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1. BACKGROUND TO THE STUDY

Franschhoek Cableway Company (Pty) Ltd is proposing to construct a cableway from Erf 1466 (Haute Cabriere) to a top cable station located on the mountain on the Remainder of Erf 23, within the Mont Rochelle Nature Reserve (Stellenbosch Municipality). This report assesses the ecological condition of the associated aquatic features, and the potential impacts of the works undertaken and provides mitigation/rehabilitation measures for the identified impacts.

Table 1. Key information related to the water resources which may be impacted by the proposed activities

Descriptor	Name / details	Notes
Water Management Area	Berg Olifants WMA	
Catchment Area	Franschhoek River	Tributary of the Berg River
Quaternary Catchment	G10C	
Present Ecological State (PES)	D (Largely modified)	DWAF 2012
Ecological Importance and Ecological Sensitivity (EI&ES)	Ecological Importance – Moderate Ecological Sensitivity – High	
Latitude	33°54'49.6"S	Lower cable station
Longitude	19°8'10.1"E	

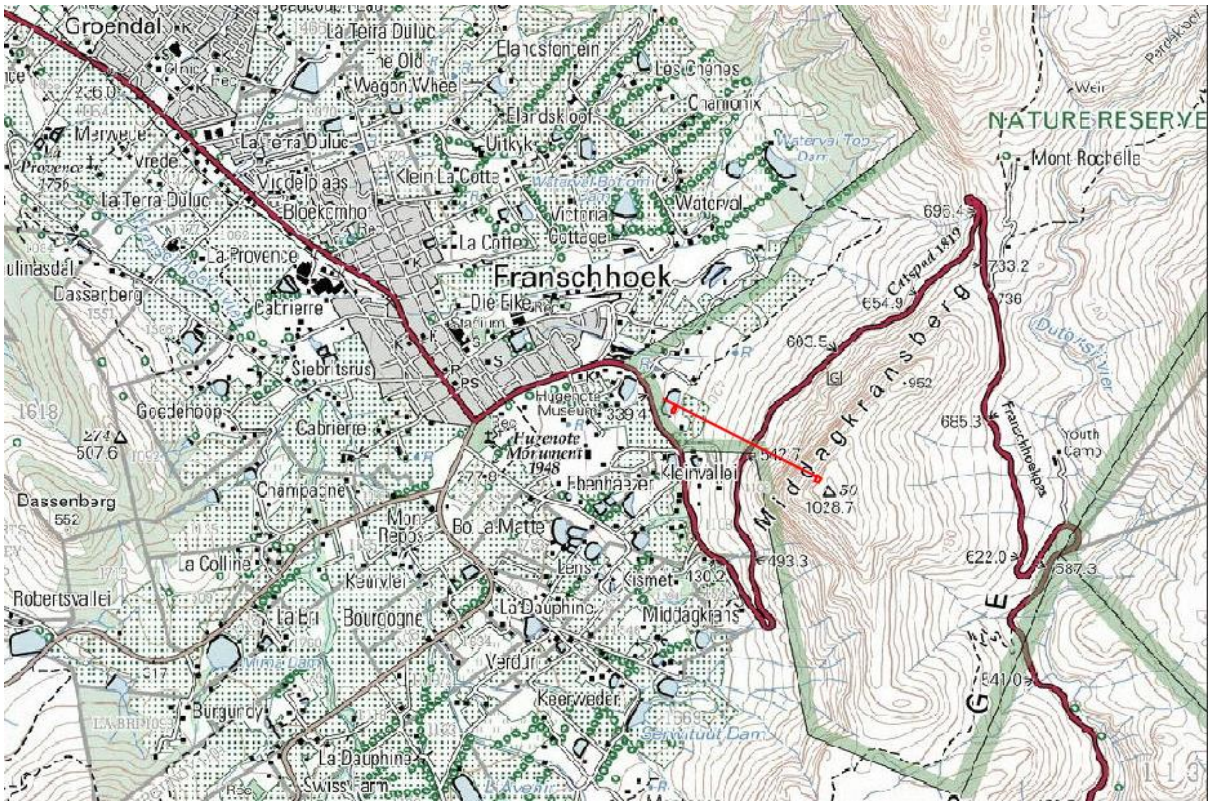

Figure 1. A topographical map of the study area showing the location of the proposed cableway

2. TERMS OF REFERENCE

The scope of works for this specialist aquatic assessment report comprises the following tasks:

SCENARIO 1: INITIAL SITE SENSITIVITY VERIFICATION + COMPLIANCE STATEMENT

1. Initial Site Sensitivity Verification

The current use of the land and the potential environmental sensitivity of the site as in the Screening Report must be confirmed by undertaking an Initial Site Sensitivity Verification. The Initial Site Sensitivity Verification must be undertaken through the use of:

- a desk top analysis, using satellite imagery;
- a preliminary on-site inspection; and
- any other available and relevant information.

The outcome of the Initial Site Sensitivity Verification must be recorded in the form of a report that:

- confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool;
- contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

2. Aquatic Biodiversity Compliance Statement

The Aquatic Biodiversity Compliance Statement, must be prepared on the site being submitted as the preferred development site and must verify:

- That the site is of "**Low**" sensitivity for aquatic biodiversity; and
- Whether or not the proposed development will have any impact on the biodiversity feature

The impacts must be assessed according to the **impact assessment criteria and tables** provided.

The **Aquatic Biodiversity Compliance Statement**, must contain, as a minimum, the following information:

(a) Baseline profile description of biodiversity and ecosystems, including the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;

(b) Methodology used to verify the sensitivities of the terrestrial biodiversity on the national web-based environmental screening;

(c) Methodology used to undertake the site survey and prepare the Compliance Statement, including equipment and modelling used where relevant;

(d) Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;

(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;

(f) Any conditions to which the statement is subjected

(g) Contact details and curriculum vitae of the specialist, including SACNASP registration number and field of expertise;

(h) A signed statement of independence by the specialist.

SCENARIO 2: INITIAL SITE SENSITIVITY VERIFICATION + BASELINE ANALYSIS + AQUATIC BIODIVERSITY SPECIALIST ASSESSMENT

1. **Initial Site Sensitivity Verification** Refer to *SCENARIO 1: INITIAL SITE SENSITIVITY VERIFICATION + COMPLIANCE STATEMENT*

2. Aquatic Biodiversity Constraints Report

You are required to produce a **baseline description**, which must include the following:

(a) Description of the preferred development site

A description of the aquatic biodiversity and ecosystems on the site, including:

i aquatic ecosystem types;

ii presence of aquatic species and composition of aquatic species communities, their habitat, distribution and movement patterns.

(b) Description of the threat status - A description including:

i the threat status of the ecosystem and species as identified by the screening tool;

ii the National and Provincial priority status of the aquatic ecosystem i.e. is this a wetland or river Freshwater Ecosystem Priority Area (FEPA), a FEPA sub-catchment, a Strategic Water Source Area (SWSA), a priority estuary, whether or not they are free-flowing rivers, wetland clusters, etc., a CBA or an ESA; including for all a description of the criteria for their given status.

(c) Ecological Importance and Sensitivity - A description of the Ecological Importance and Sensitivity (EIS) of the aquatic ecosystem including:

i The description (spatially, if possible) of the ecosystem processes that operate in relation to the aquatic ecosystems on and immediately adjacent to the site (e.g. movement of surface and subsurface water, recharge, discharge, sediment transport, etc.);

ii The historic ecological condition (reference) as well as Present Ecological State (PES) of rivers (in-stream, riparian and floodplain habitat), wetlands and/or estuaries in terms of possible changes to the channel, flow regime (surface and groundwater).

(d) Alternatives - Identify any alternative development footprints within the preferred development site which would be of a "low" sensitivity as identified by the national web-based environmental screening tool and verified through the Initial Site Sensitivity Verification;

(e) Maps - Mapping of watercourses on the affected portion of the property. Provide the GIS shape files or Google Earth files (KMZ or KML) for all the constraints identified.

(f) Buffers - Recommendations must be made for adequate buffers around sensitive areas (if applicable).

(g) Legalisation and permits - Identify all relevant legislation, permits and standards that would apply to the development.

3. Aquatic Biodiversity Specialist Assessment

Update the baseline assessment into one report that will assess the impacts for each of the proposed development alternatives and the no-go option. The protocols for Aquatic Impact Assessments apply.

4. **Respond to Comments from the I&APs and Authorities**

After the commenting period has closed, a comments and response table will be sent. Responses are required to all relevant comments.

3. METHODOLOGY AND LIMITATIONS OF THE STUDY

Input into this report was informed by a combination of desktop assessments of existing freshwater ecosystem information for the study area and catchment, as well as a site visit in November 2021 after a reasonably wet winter rainfall period. Timing of the assessment was thus deemed suitable.

During the field visit, the characterisation and integrity assessments of the freshwater features were undertaken. Mapping of the freshwater features was undertaken using GPS Tracker and mapped in Google Earth Professional. Past imagery of the site was also consulted to determine past land use and modification activities that have taken place within the study area.

The SANBI Biodiversity GIS and Cape Farm Mapper websites were consulted to identify any constraints in terms of fine-scale biodiversity conservation mapping as well as possible freshwater features mapped in the Freshwater Ecosystem Priority Areas maps. This information/data was used to inform the resource protection-related recommendations.

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of ecosystems. The following techniques and methodology were utilised to undertake this study:

- Analysis of the freshwater ecosystems was undertaken at a rapid level and did not involve detailed habitat and biota assessments.
- The watercourse was assessed using National River Ecostatus methodologies
- The guideline document, “A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas” document, as published by DWAF (2005) was followed for the delineation of the wetland area.
- The wetland was subsequently classified according to their hydro-geomorphic determinants based on a classification system devised by Kotze *et al* (2004) and SANBI (2009). Notes were made on the levels of degradation in the wetland based on field experience and a general understanding of the type of system present.
- A Present Ecological State (PES) assessment was conducted for the wetland identified and delineated within the study area using national WET-Health methods.
- The functional wetland assessment technique, WET-EcoServices, developed by Kotze *et al* (2009) was used to indicate the ecological benefits and services provided by delineated wetland habitat. This technique consists of assessing a combination of desktop and infield criteria to identify the importance and level of functioning of the wetland units within the landscape.
- The ecological importance and sensitivity assessment was conducted according to the guidelines as developed by DWAF (1999).

The level of aquatic assessment undertaken was considered to be adequate for this study.

4. USE OF THIS REPORT

This report reflects the professional judgment of its author. The full and unedited content of this should be presented to the client. Any summary of these findings should only be produced in consultation with the author.

5. DESCRIPTION OF THE STUDY AREA

5.1 VISUAL CHARACTERISTICS AND TOPOGRAPHY

The site is located at the eastern extent of the Franschhoek Valley, on the western slope of the Franschhoek Mountain. The gradient of the slope at the site is steep, with the lower station at approx. 370m and the upper station at approx. 1010m above mean sea level. The length of the cableway is about 1.1 km, giving an average gradient of about 44%. The general drainage is towards the Franschhoek River which flows in a northwesterly direction to join the larger Berg River in the upper Berg River Catchment. The vegetation within the valley is dominated by a mix of alien and indigenous species. The surrounding landscape on the valley floor has mostly been modified and comprises cultivated and transformed areas however the mountain slope is within the Mount Rochelle Nature Reserve and is largely natural. The average gradient on the backslope of the Middagkransberg on which the top station is proposed is about 24%. Drainage on the slope is eastwards, towards the Du Toits River, a tributary of the Riviersonderend River in the Breede River Catchment.

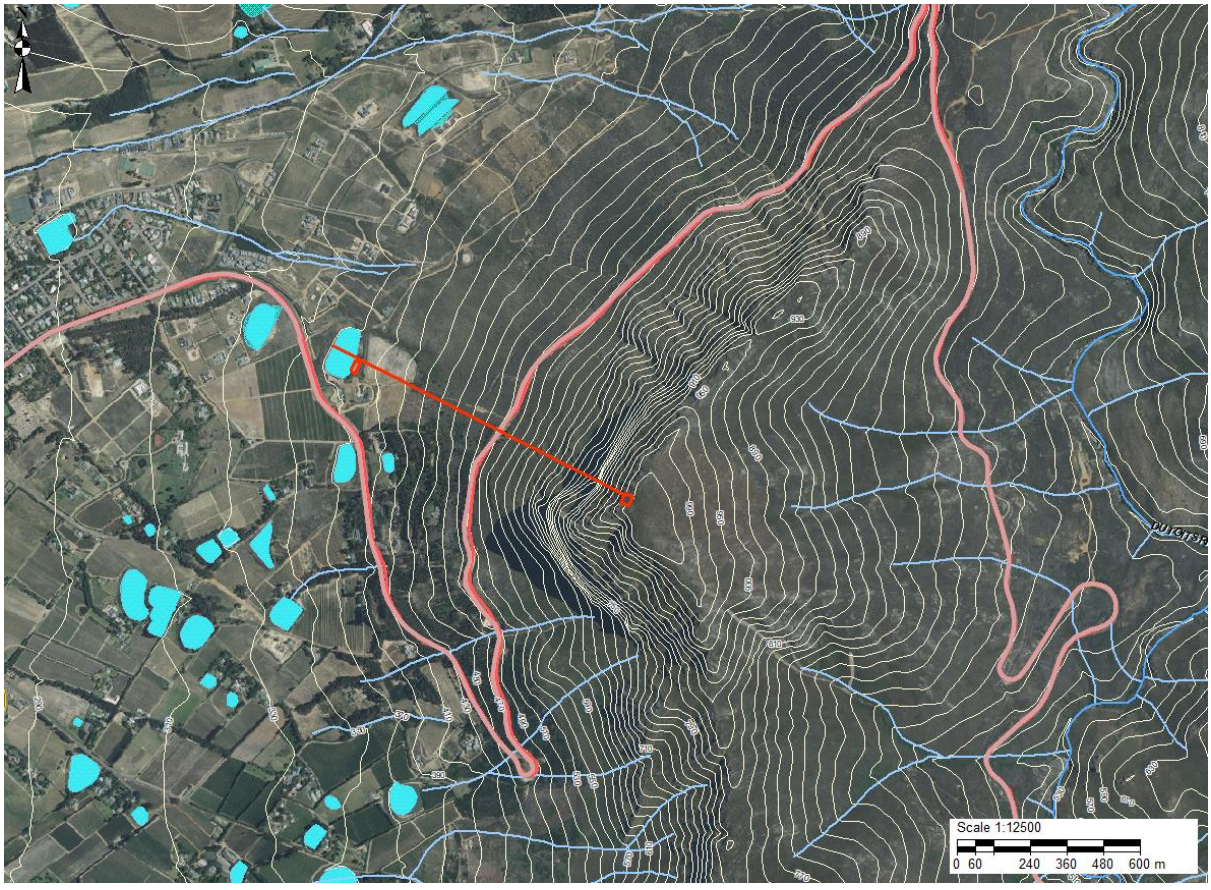

Figure 2. Orthophotograph taken in 2016 of the study area with 5m countour lines shown

5.2. CLIMATE

The area has a Mediterranean climate. Summers are typically hotter, drier and have greater evaporation rates, while winters are cold and wet (Figure 3). On average, the area receives approximately 800mm to 900mm of rainfall per year. The runoff and the resulting flow within the streams on the site is higher during winter (May to August), flowing for a short period during and after local rainfall events. This is an important consideration when

planning the construction of the proposed infrastructure, which is close to any of the watercourses. By conducting construction during summer (November/December to March/April), the impacts of the construction phase can be greatly reduced.

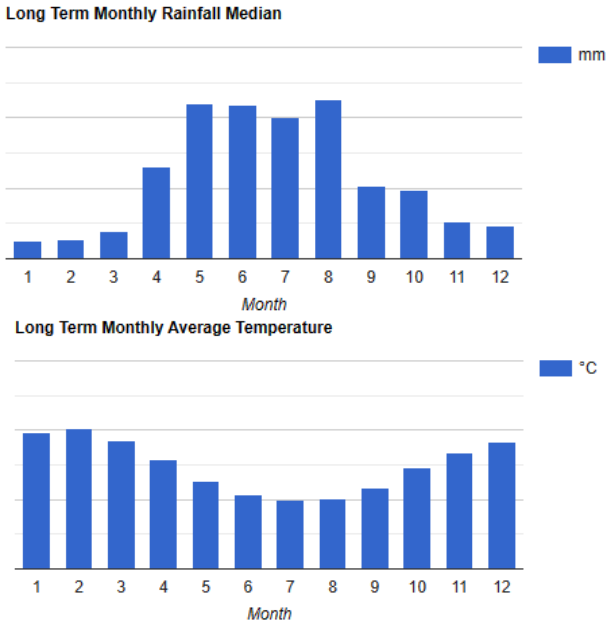

Figure 3. Average rainfall (top) and temperature (bottom) graphs for the area between 1950 and 2000

5.3. GEOLOGY AND SOIL

The geology of the area comprises either granite of the Stellenbosch Pluton, Cape Granite Suite or quartzitic sandstone of the Peninsula Formation. On the higher slopes at the site, the soils are mapped as freely drained soils, which are usually red-yellow and do not form well-consolidated peds (Figure 4). The lower slopes are mapped as a plinthic catena, which is characterised by the grading of soils from red through yellow to grey. Soils usually have low to medium nutrient content.

5.4. FLORA

Mucina and Rutherford (2006) mapped the natural vegetation types in South Africa on a national scale. Where indigenous vegetation has been significantly removed, the mapping of vegetation was guided by variables such as soil type. Due to the large scale at which this mapping was conducted, the finer scale boundaries of mapped units are often not always very accurate. The mapping was updated by the South African National Biodiversity Institute (SANBI) in 2009, 2012 and more recently, in 2018. Figure 5 shows the 2018 update of the mapping of Mucina and Rutherford (2006).

The natural vegetation cover within the study area comprises mostly Kogelberg Sandstone Fynbos (Critically Endangered) on the higher slopes, with Boland Granite Fynbos (Endangered) on the lower slopes. Cape Wineland Shale Fynbos (Vulnerable) and Swartland Alluvium Fynbos (Endangered) are mapped as occurring at the foot of the slope, near the lower cable station. Here the natural vegetation cover has however mostly been removed and replaced with vineyards. The vegetation associated with the aquatic features is described in more detail in the following section.

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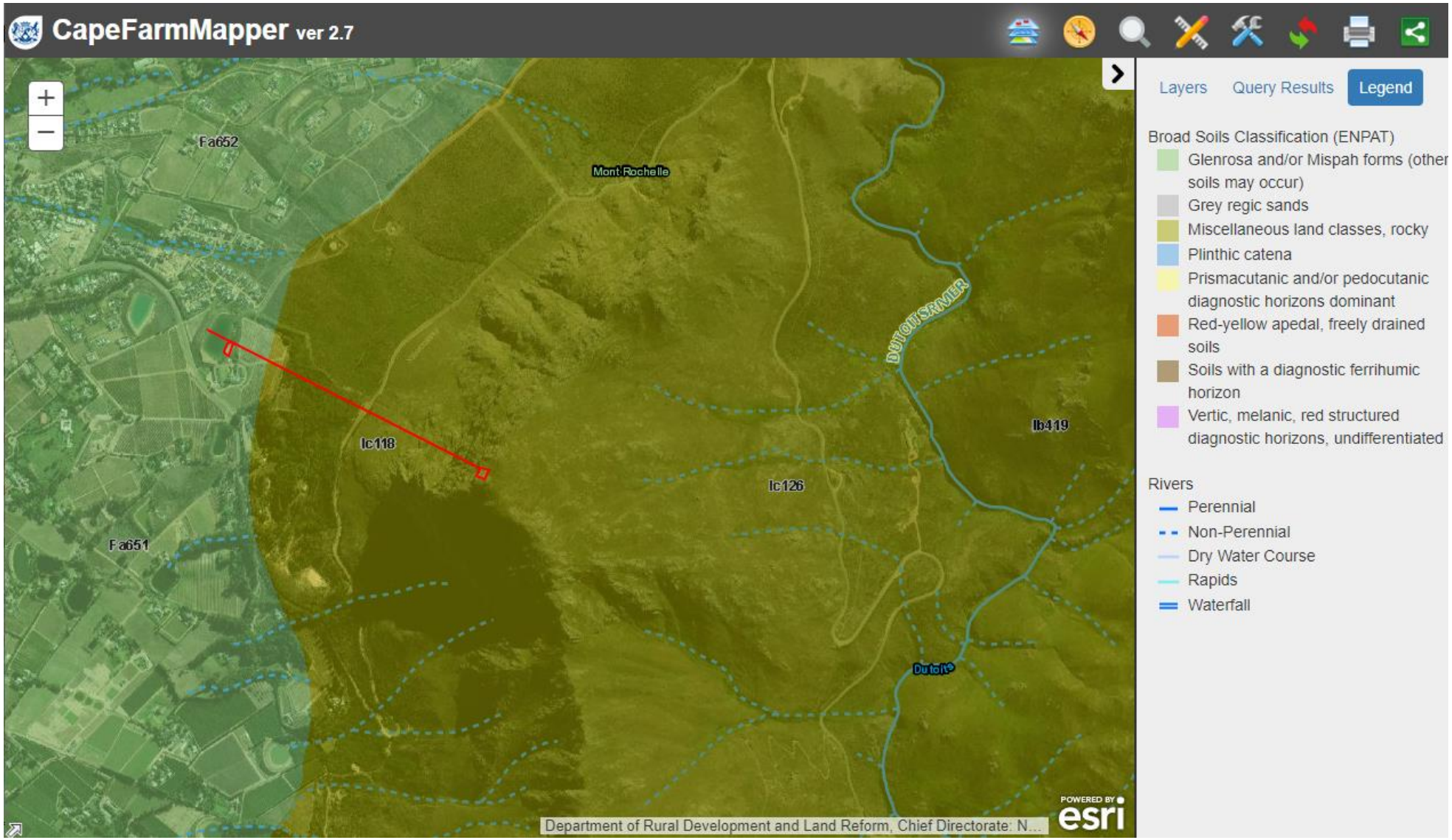


Figure 4. Soils map for the site (ENPAT data available from CapeFarmMapper (https://gis.elsenburg.com/apps/cfm/))

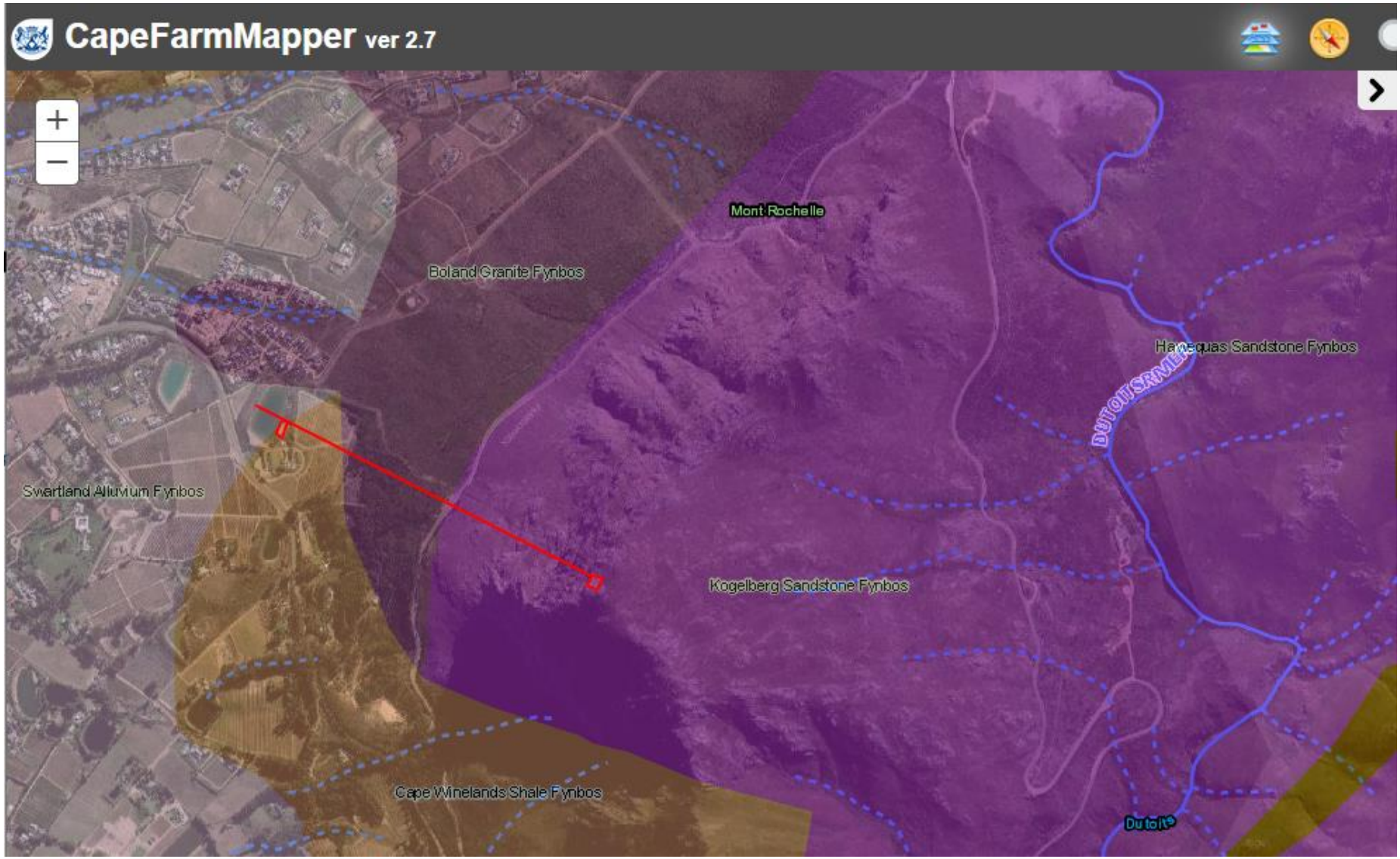


Figure 5. Vegetation map for the site (South African National Biodiversity Institute. 2018 Vegetation Map, available from CapeFarmMapper (https://gis.elsenburg.com/apps/cfm)

5.5. AQUATIC FEATURES

The site lies over the watershed between the Franschhoek Tributary of the Berg River (Quaternary G10A) and the Du Toits Tributary of the Riviersonderend River (H60B). In the National Freshwater Ecosystem Priority Areas (FEPA) mapping initiative, the Franschhoek Catchment is mapped as a Fish Support Area (*Galaxias zebratus, Pseudobarbus burgi* and *Sandelia capensis* are recorded as having occurred in the river) while the Du Toits Catchment is a FEPA Subcatchment. The only wetlands mapped by the FEPA initiative in the area are artificial wetlands associated with nearby farm dams (Figure 7). There are no watercourses or wetlands mapped within the areas proposed development apart from the dam at the lower cable station. The aquatic feature is further assessed and described in Section 6 of this report.

5.6. CONSERVATION VALUE OF THE FRESHWATER FEATURES

The DFFE Screening Tool indicates the wider area in which the site is located to be of Very High Aquatic Biodiversity Combined Sensitivity. This is largely associated with the Strategic Water Source Area for surface water (Boland) as well as groundwater (Southwestern Cape Ranges) that occur within the upper Berg, Breede and Eerste River Catchments.

In addition to the above, three sets of conservation mapping results are of relevance to the national and provincial identification of the biodiversity conservation importance that has been attributed to the freshwater features in the study area. The 2017 Western Cape's Biodiversity Spatial Plan (WCBSP) contains Critical Biodiversity Areas (CBA) for the Stellenbosch Municipality and was a product of the Provincial Fine Scale mapping process, as well as the 2010 National FEPA mapping and National Wetland Map version 5 (NWM5).

The 2017 WCBSP map aims to guide sustainable development by providing a synthesis of biodiversity information to decision-makers to ensure appropriate land use and planning for the best possible long-term benefits and to promote integrated management of natural resources. The main map categories are CBAs (Terrestrial and Aquatic), Ecological Support Areas (ESA) (Critical and Other), Other Natural Remaining Areas and No Natural Remaining Areas. The first two mentioned categories represent the biodiversity priority areas that should be maintained in a natural to a near-natural state. The last two mentioned categories are not considered priority areas and a loss of biodiversity within these areas may be acceptable. Most of the study area lies within the Mont Rochelle Nature Reserve. Mapping outside of this area comprises largely terrestrial CBAs and ESAs. The hillslope is also indicated to be important as a water recharge area, while the dam is mapped as a watercourse requiring rehabilitation.

FEPAs are intended to provide strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting the sustainable use of water resources. FEPAs were determined through a process of systematic biodiversity planning and were identified using a range of criteria for serving ecosystems and associated biodiversity of rivers, wetlands and estuaries. The river and wetland FEPAs are required to be maintained in a largely natural ecological state while Fish Support Areas should not be allowed to degrade from their existing ecological condition. The larger sub-catchment of the Franschhoek River is mapped as Fish Support Area for the conservation of indigenous fish that still occur in the upper Berg River while the Du Toits River is mapped as a FEPA River as it forms part of the upper Riviersonderend River. As stated previously, the FEPA wetland areas mapped near the site relate to artificial wetland areas associated with dams (Figure 9). There are no wetlands within the study area mapped within the NWM.

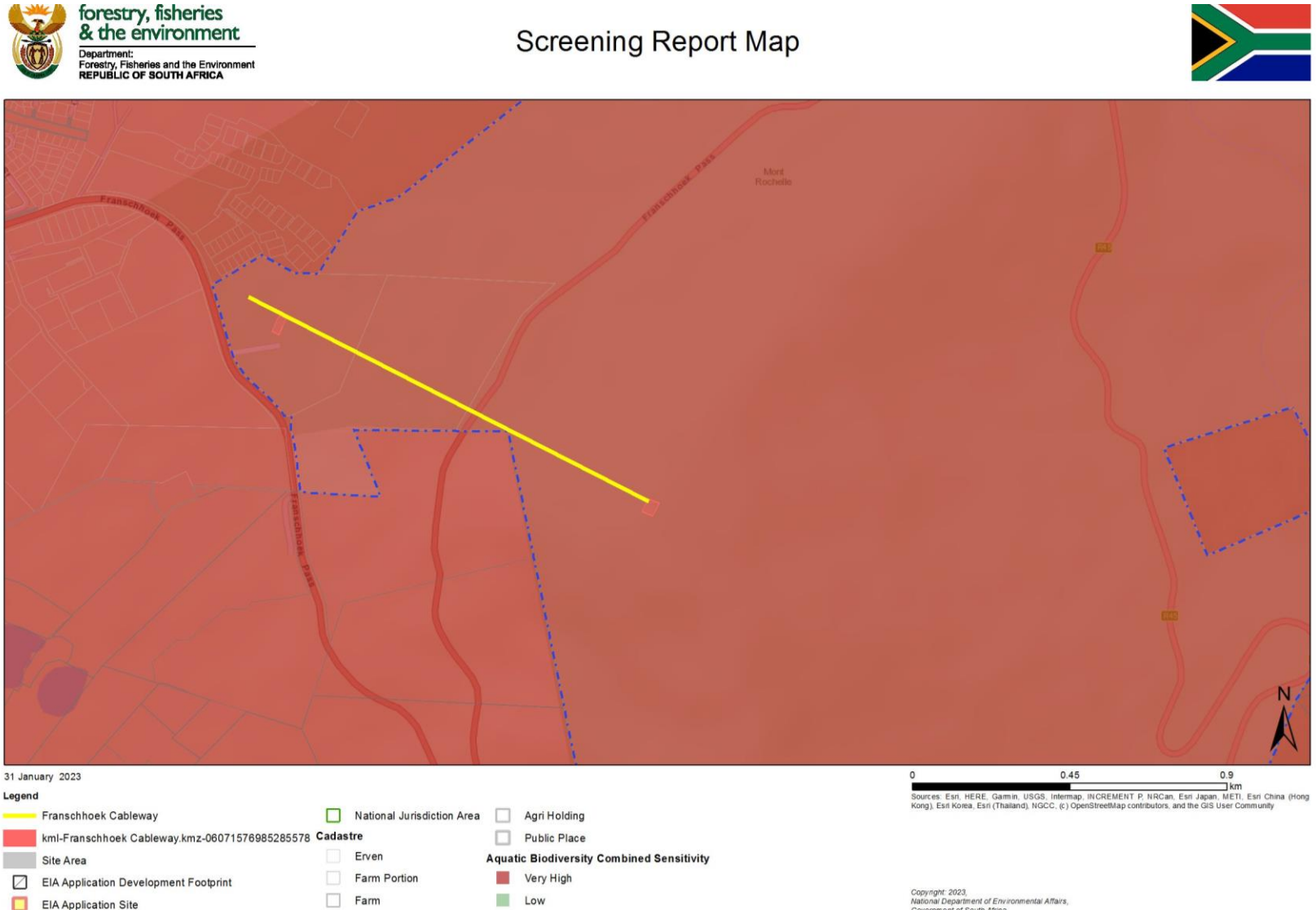


Figure 6. DFFE Screening Tool Aquatic Biodiversity Combined Sensitivity mapping for the site and wider area (https://screening.environment.gov.za/server/)

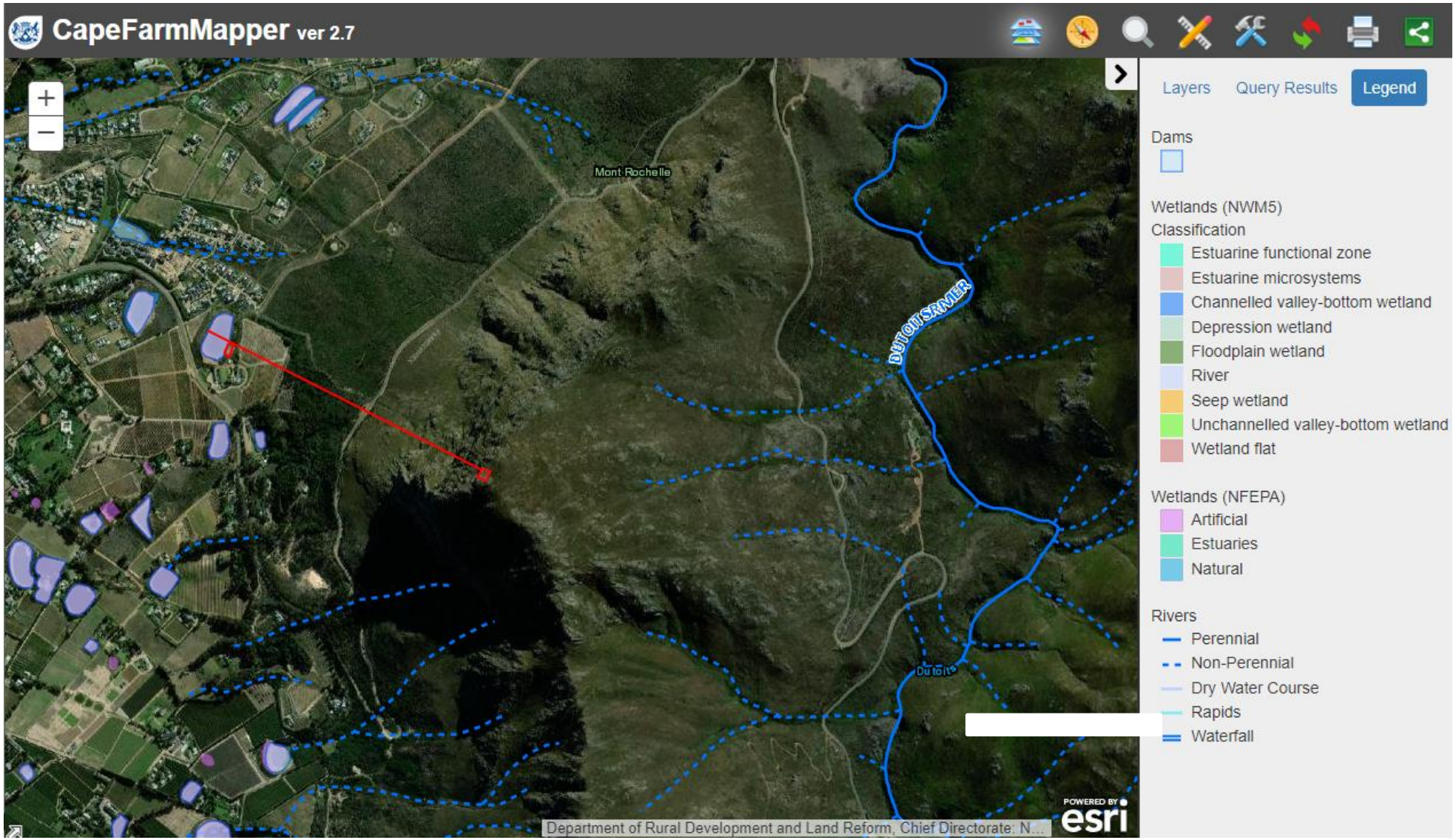


Figure 7. Aquatic features mapped in and adjacent to the site (FEPA and NWM5, CapeFarmMapper)

Figure 8. 2018 Western Cape Biodiversity Spatial Plan for the area surrounding the site (CapeFarmMapper (https://gis.elsenburg.com/apps/cfm/)

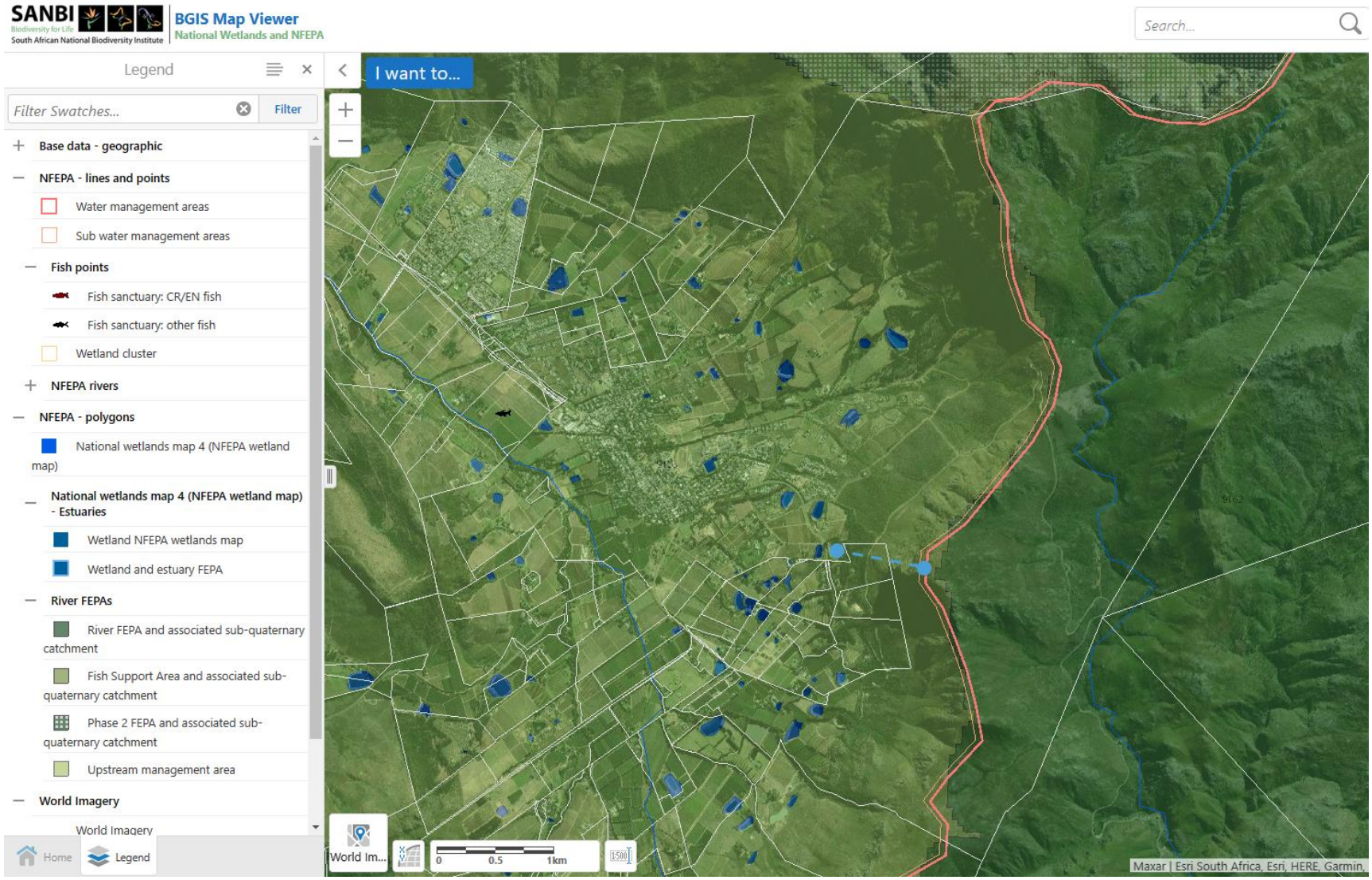


Figure 9. River Freshwater Ecosystem Priority Areas within the wider vicinity of the site (Council for Scientific and Industrial Research. NFEPA rivers 2011 available from SANBI BiodiversityGIS (http://bgis.sanbi.org)

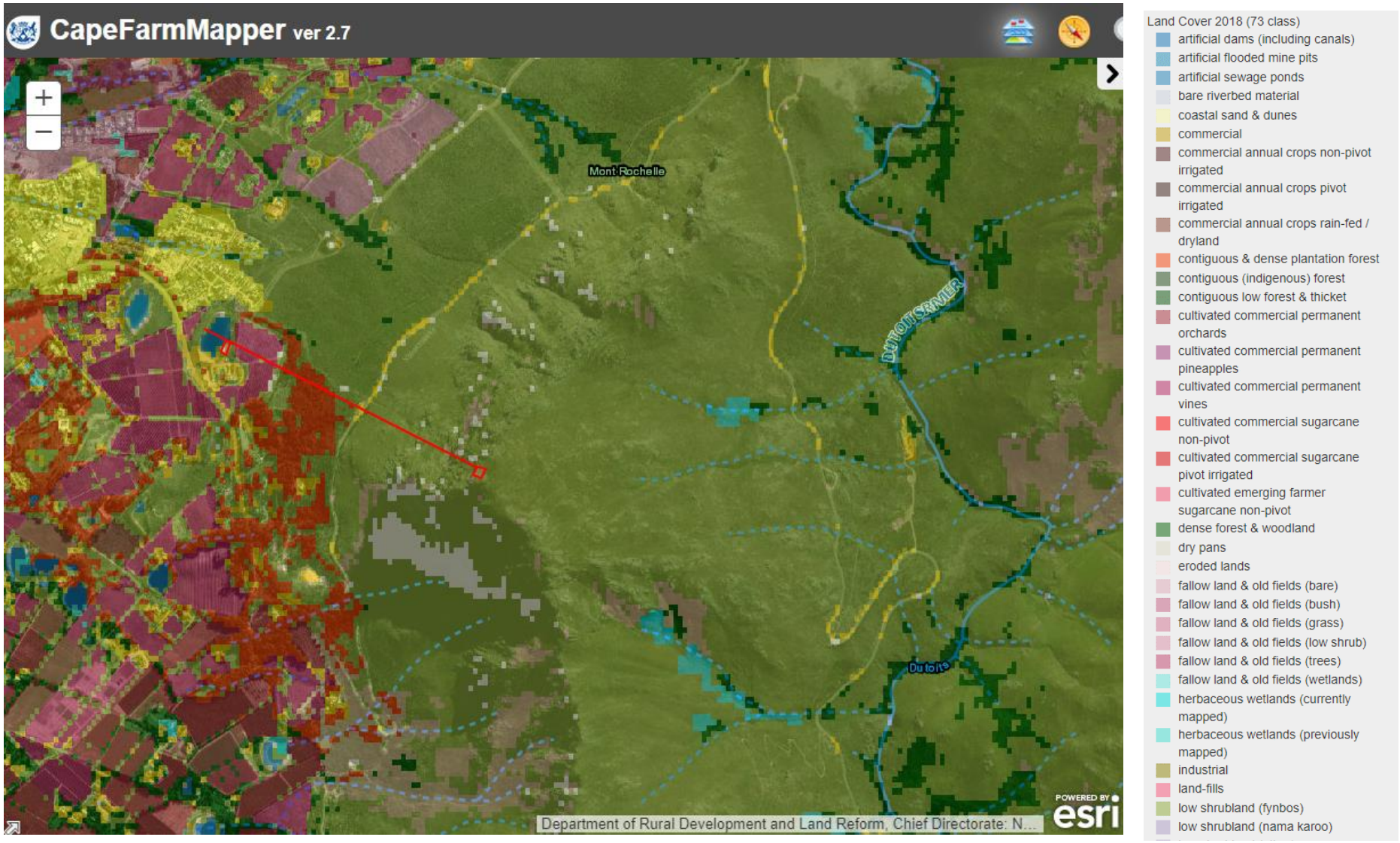


Figure 10. DEA 2020 land cover mapping for the site (CapeFarmMapper)

5.7. LAND AND WATER USE

The land cover on the western extent of the study site is dominated by cultivated areas such as vineyards with some shrublands in between (Figure 10). The portions in the east of the site are mapped as natural areas within the formally protected Mont Rochelle Nature Reserve which is located in the higher-lying areas in the eastern half of the site.

6. ASSESSMENT OF AQUATIC FEATURES

6.1. HISTORICAL MODIFICATION

Aerial photography of the site, captured in 1938, was used to better understand the nature of aquatic features and the history of the human impacts upon them. The imagery shows that the site was almost entirely undeveloped more than 80 years ago. The clearly defined watercourses and wetland areas along the backslope can be seen. Patches of alien vegetation appear to have existed at the proposed lower cable station where there is currently an instream dam. No watercourse was present in this area.

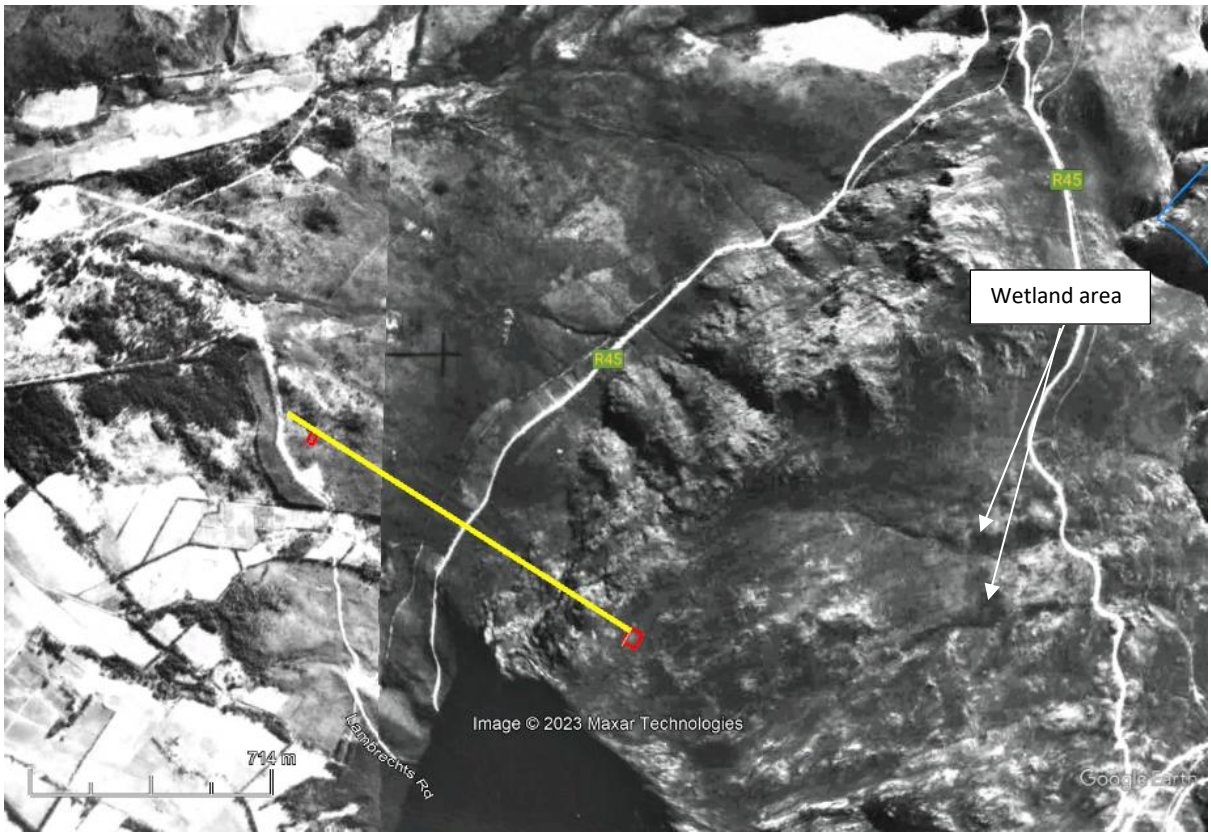


Figure 11. A Google Earth image with a 1938 aerial photograph overlay, showing the proposed development layout

6.2. DESCRIPTION OF AQUATIC FEATURES

There are no natural aquatic features near the proposed cableway and the proposed lower and upper cable stations. Artificial wetland areas associated with the dam occur at the lower cable station. The aquatic features

within the wider study area comprise small streams and their associated wetland areas on the backslope of Middagkransberg as well as some that drain the face of the mountain and are more than 350m from the proposed project activities. The aquatic features are mapped in Figure 12 and described below.

The small streams draining the backslope of Middagkransberg originate on the hillslope. They flow for approximately 1200 m before joining the De Toits River. The watercourses are non-perennial in their upper reaches but comprise large seep areas in their middle reaches where they flow over large slabs of sandstone> These seeps contribute to flow for the lower reaches. With the exception of localised disturbance at the Franschhoek Pass Road, the watercourses are still largely natural.

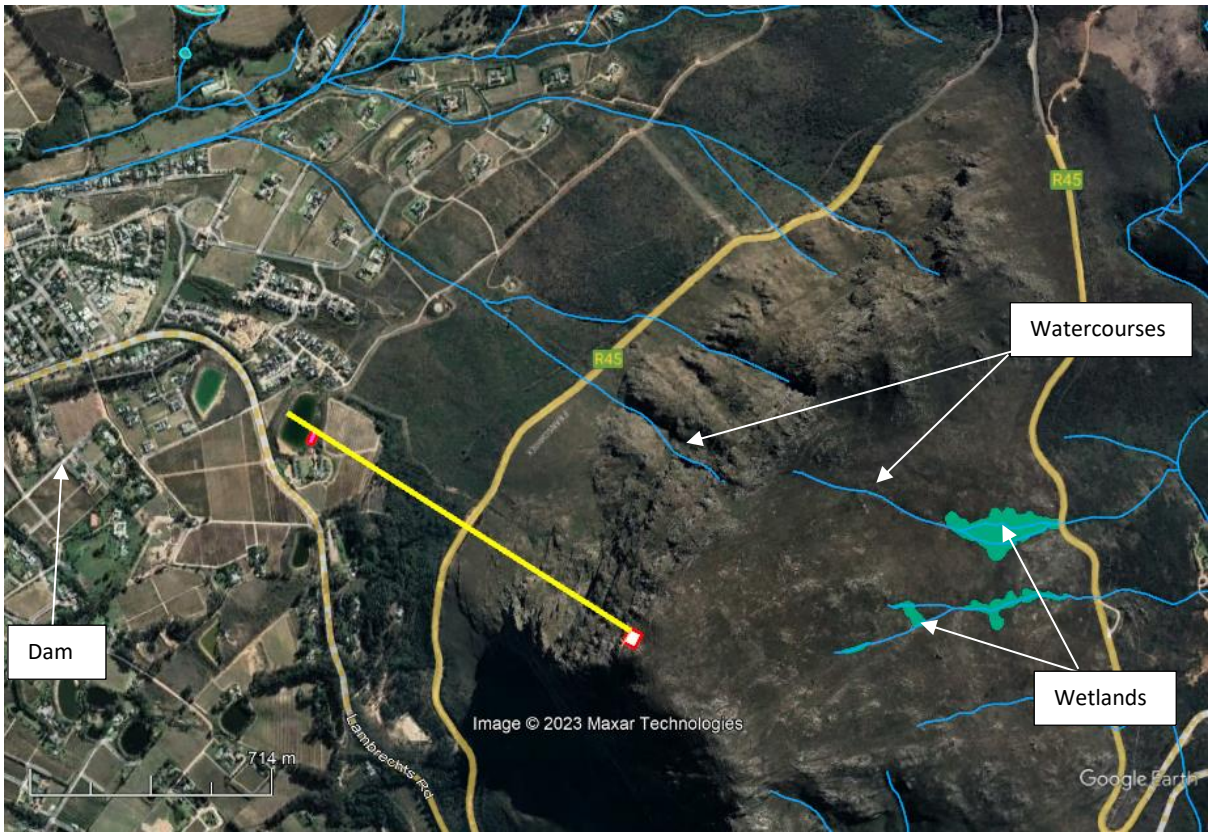


Figure 12. Google Earth image showing the aquatic features within the study area

Indigenous vegetation occurring along the watercourses and in the seeps includes stream conebush (*Leucadendron salicifolium*), kolkol (*Berzelia abrotanoides*), fountain reed (*Cannomois grandis*), restios (*Thamnochortus guthrieae*), sundews (*Drosera trinervia),* purple gorse (*Muraltia filiformis*), catstail bush (*Microdon dubius*), *Aristea capitata,* butterfly lily (*Wachendorfia paniculata*), and satyre (*Satyrium humile*). Amphibians observed in this area include De Villiers's Moss Frog (*Arthroleptella villiersi*), Clicking Stream Frog (*Strongylopus grayii*), Mountain Rain Frog (*Breviceps montanus*), Cape River Frog (*Amietia fuscigula*) and Cape Sand Frog (*Tomopterna delalandii*). All of the above have a conservation status of Least Concern.

Figure 13. View of the hillslope seep and downstream watercourse on the backslope of Middagkransberg

The dam at the lower cable station is artificial, where wetland habitat has developed. Indigenous vegetation has however been planted around the dam. Vegetation within the more permanently wet areas of the dam consists mostly of small patches of bulrushes (*Typha capensis*) with riverbed grass (*Pennisetum macrourum*).

Figure 14. View of the small dam at the proposed lower cable station

6.3. PRESENT ECOLOGICAL STATUS OF THE WATERCOURSES AND WETLANDS

6.3.1. RIVER CHARACTERISATION

River typing or classification involves the hierarchical grouping of rivers into ecologically similar units so that inter-and intra-river variation in factors that influence water chemistry, channel type, substratum composition and hydrology are best accounted for. Any comparative assessment of river condition should only be done between rivers that share similar physical and biological characteristics under natural conditions. Thus, the classification of rivers provides the basis for assessing river condition to allow comparison between similar river types. The primary classification of rivers is a division into Ecoregions. Rivers within an ecoregion are further divided into sub-regions.

Ecoregions: groups of rivers within South Africa, which share similar physiography, climate, geology, soils and potential natural vegetation. For this study, the ecoregional classification presented in DWAF (1999), which divides the country's rivers into ecoregions, was used. The area assessed lies within the Southern Folded Mountain Ecoregion, the typical characteristics of which are described in Table 2.

Table 2. Characteristics of the Southern Folded Mountain Ecoregion

Main Attributes	Characteristics
Terrain Morphology	Lowlands; Hills and Mountains; Moderate and High Relief; Open Hills; Lowlands; Mountains; Moderate to High Relief; **Closed Hills; Mountains; Moderate and High Relief**
Vegetation types	Patches Afromontane Forest; **Grassy Fynbos; Mountain Fynbos;** South and South West Coast Renosterveld; Central Mountain Renosterveld; West Coast
Altitude	0-300 limited; 300-1900 (m a.m.s.l)
MAP	200 to 1500 (mm)
Coefficient of Variation	<20 to 39 (% of annual precipitation)
Rainfall concentration index	<15 to 54
Rainfall seasonality	Very late summer to winter to all year
Mean annual temp. (°C)	10 to 20
Median annual simulated runoff	<5; >250 (mm) for quaternary catchment

Sub-regions: sub-regions (or geomorphological zones) are groups of rivers or segments of rivers, within an ecoregion, which share similar geomorphological features, of which gradient is the most important. The use of geomorphological features is based on the assumption that these are a major factor in the determination of the distribution of the biota. From the Site Characterisation assessment, the geomorphological and physical characteristics of the rivers at the site can be classified as follows:

Table 3. Geomorphological and physical features of the watercourse within the site

River	Small streams
Valley Form	Mountain stream to upper foothill
Lateral mobility	Moderately confined by topography
Channel form	Single to multiple channels
Channel pattern	Low sinuosity
Channel type	Bedrock, sand, silt and gravel
Hydrology	Seasonal flow becoming more permanent below seeps

6.3.2. INDEX OF HABITAT INTEGRITY

Evaluation of the Index of Habitat Integrity (IHI) provides a measure of the degree to which a river has been modified from its natural state. This assessment was undertaken for the small streams on the hillslope. The results are provided in Table 5. The methodology (DWAF, 1999) involves a qualitative assessment of the number and severity of anthropogenic perturbations on a river and the damage they potentially inflict upon the system. These disturbances include both abiotic and biotic factors, which are regarded as the primary causes of the degradation of a river. The severity of each impact is ranked using a six-point scale from 0 (no impact) to 25 (critical impact). The IHI assessment is based on an evaluation of the impacts of two components of the river, the riparian zone and the in-stream habitat. The total scores for the in-stream and riparian zone components are then used to place the habitat integrity of both in a specific habitat category (Table 4).

Table 4. Habitat Integrity categories (From DWAF, 1999)

Category	Description	Score (%)
A	Unmodified, natural.	90-100
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	80-90
C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.	60-79
D	Largely modified. Large loss of natural habitat, biota and ecosystem function.	40-59
E	The loss of natural habitat, biota and basic ecosystem functions is extensive.	20-39
F	Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota.	0

Table 5. Index of Habitat Integrity Assessment results and criteria assessed

Riparian Zone Habitat Integrity		Instream Habitat Integrity	
Vegetation Removal	4	Water Abstraction	3
Exotic Vegetation	2	Flow Modification	4
Bank Erosion	5	Bed Modification	4
Channel Modification	4	Channel Modification	4
Water Abstraction	3	Water Quality	4
Inundation	4	Inundation	2
Flow Modification	3	Exotic Macrophytes	2
Water Quality	4	Exotic Fauna	3
		Rubbish Dumping	3
INTEGRITY CLASS	**B**	**INTEGRITY CLASS**	**B**

The streams are considered to be largely natural, with the most significant impacts being localised habitat modification with limited flow and water quality impacts at the Franschhoek Pass Road.

6.4. PRESENT ECOLOGICAL STATUS OF THE WETLAND AREA

6.4.1. WETLAND CHARACTERISATION

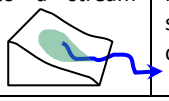
In South Africa, wetlands are defined as "*…land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil*" (National Water Act, Act No. 36 of 1998, (NWA) and Environmental Impact Assessment Regulations: Listing Notice 1 OF 2014 Government Notice R983 in Government Gazette 38282 dated 4 December 2014, as amended by Government Notice 327 in Government Gazette 40772 dated 7 April 2017). Wetlands are also included in the definition of a watercourse within the NWA, which implies that whatever legislation refers to watercourses will also apply to wetlands.

The wetland areas delineated within the study area are shown in Figure 12. The wetland areas can be classified according to the wetland type described in Table 6. The classification of the wetlands is provided in Table 7

Table 6: Classification of wetland area within the study site

Name	Seep wetland
System	Inland
Ecoregion	Southern Folded Mountain
Landscape setting	Upper hillslope
Drainage	Hillslope seep – some surface/subsurface water inflow and outflow to/from channel and adjacent slopes
Seasonality	Seasonal to permanent
Anthropogenic influence	None
Geology	Weathered sandstone; occasional alluvium
Terrestrial Vegetation	Kogelberg Sandstone Fynbos
Wetland vegetation	Mix indigenous fynbos seep vegetation, including stream conebush and fountain reeds
Substrate	Sand
Salinity	Fresh

Table 7: Description of applicable wetland hydro-geomorphic type

Hydro-geomorphic types	Description	Source of water [1]	
		Surface	Sub-surface
Hillslope seepage linked to a stream channel 	Slopes on hillsides, which are characterised by the colluvial movement of materials. Water inputs are mainly from sub-surface flow and outflow is usually via a well-defined stream channel connecting the area directly to a stream channel.	*	***

[1] Precipitation is an important water source and evapotranspiration an important

Water source: * Contribution usually small or *** Contribution usually large

*/*** Contribution may be small or important depending on the local circumstances

Wetland

6.4.2. WETLAND HABITAT INTEGRITY

The Present Ecological Status (PES) Method (DWAF 2005) was used to establish the integrity of the wetlands in the study area and was based on the modified Habitat Integrity approach developed by Kleynhans (DWAF, 1999; Dickens *et al*, 2003). Table 8 displays the criteria and results from the assessment of the habitat integrity of the wetlands. These criteria were selected based on the assumption that anthropogenic modification of the criteria and attributes listed under each selected criterion can generally be regarded as the primary causes of the ecological integrity of a wetland.

Table 8. Habitat integrity assessment criteria for palustrine wetlands (Dickens *et al*, 2003) and the results for the seep wetland within the site

Criteria	Relevance	Score
Hydrologic		
Flow Modification	Changes in flow regime, volume, velocity and inundation of habitats resulting in floralistic changes or incorrect cues to biota. Abstraction of groundwater flows to wetland.	4.8
Inundation	Impoundment resulting in destruction of wetland habitat and cues for wetland biota.	4.5
Water Quality		
Water Quality Modification	Point or diffuse sources (upstream agricultural activities, human settlements and industrial activities). Aggravated by volumetric decrease in flow delivered to the wetland.	4.2
Sediment Load Modification	Reduction due to entrapment by impoundments or increase due to land use practices. Cause of unnatural rates of erosion, accretion, infilling of wetlands and habitat change.	4.3
Hydraulic/Geomorphic		
Canalisation	Desiccation / change to inundation of wetland and habitat change. River diversions or drainage.	4.5
Topographic Alteration	Consequence of infilling, ploughing, trampling, bridges, roads, railway lines and other substrate disruptive activities that reduce or change wetland habitat directly in inundation patterns.	4.8
Biota		
Terrestrial Encroachment	Desiccation of wetland and encroachment of terrestrial plants due to changes in hydrology or geomorphology. Change from wetland to terrestrial habitat and loss of wetland functions.	4.7
Indigenous Veg Removal	Direct destruction of habitat through farming or firewood collection affecting wildlife habitat and flow attenuation functions, organic matter inputs and increase in erosion.	4.9
Invasive Plants	Affects habitat through changes in community structure and water quality changes.	4.8
Alien Fauna	Presence of alien fauna affecting faunal community structure.	45
Over utilisation	Overgrazing, over fishing, etc.	5
Category		B

Table 9. Relation between scores given and ecological categories

Scoring Guidelines	Interpretation of Scores for all Attributes: Rating of Present Ecological Status Category (PESC)
Natural, unmodified – score=5.	CATEGORY A >4; Unmodified, or approximates natural condition.
Largely natural – score=4.	CATEGORY B >3 and ≤4; Largely natural with few modifications, but with some loss of natural habitats.
Moderately modified- score=3.	CATEGORY C >2 and ≤3; moderately modified, but with some loss of natural habitats.
Largely modified – score=2.	CATEGORY D ≤2; largely modified. Large loss of natural habitat & basic ecosystem function has occurred.
	OUTSIDE GENERALLY ACCEPTABLE RANGE
Seriously modified – rating=1.	CATEGORY E >0 and <2; seriously modified. Extensive loss of natural habitat & basic ecosystem function.
Critically modified – rating=0.	CLASS F 0; critically modified. Modification reached critical levels with system completely modified.

The wetlands are considered to be largely natural with little to no modifications or impacts.

6.5. ECOLOGICAL IMPORTANCE AND SENSITIVITY AND ECOSYSTEM SERVICES

The Ecological Importance and Sensitivity (EIS) assessment considers several biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale (Table 10). The median of the resultant score is calculated to derive the EIS category (EISC in Table 12).

Table 10. Definition of the scale used to assess determinants presumed to indicate importance or sensitivity

Scale	Definition
1	One species/taxon judged as rare or endangered at a local scale.
2	More than one species/taxon judged to be rare or endangered on a local scale.
3	One or more species/taxon judged to be rare or endangered on a Provincial/regional scale.
4	One or more species/taxon judged as rare or endangered on a National scale (i.e. SA Red Data Books)

Table 11. Results of the EIS assessment for the watercourse and wetland on the site

Biotic Determinants	Streams	Seep wetlands
Rare and endangered biota	1.5	2.0
Unique biota	2.5	2.5
Intolerant biota	3.5	3.5
Species/taxon richness	2.0	2.5
Aquatic Habitat Determinants		
Diversity of aquatic habitat types or features	1.5	2.0
Refuge value of habitat type	2	2.5
Sensitivity of habitat to flow changes	2.5	3.5
Sensitivity of flow related water quality changes	2.5	2.5
Migration route/corridor for in-stream and riparian biota	2	2
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, Natural areas, PNEs	3.5	3.5
EIS CATEGORY	**High**	**High**

The small streams and associated wetland within the study area are considered to be of high ecological importance and sensitivity. The wetlands are particularly sensitive to flow and water quality impacts.

Table 12. Ecological importance and sensitivity categories (DWAF, 1999)

EISC	General description	Median
Very high	Quaternaries/delineations considered unique on a national and international level based on unique biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are usually very sensitive to flow modifications and have no or only a small capacity for use.	>3-4
High	Quaternaries/delineations considered unique on a national scale based on their biodiversity. These rivers may be sensitive to flow modifications but in some cases may have substantial capacity for use.	>2-≤3
Moderate	Quaternaries/delineations considered unique on a provincial or local scale due to biodiversity. These rivers are not usually very sensitive to flow modifications and often have substantial capacity for use.	>1-≤2
Low/ marginal	Quaternaries/delineations not unique on any scale. These rivers are generally not very sensitive to flow modifications and usually have substantial capacity for use.	≤1

The assessment of the ecosystem services supplied by the wetland areas on the backslope were conducted according to the guidelines as described by Kotze *et al* (2005) that examine and rate the services listed in Table 13. The characteristics were scored according to the general levels of services provided. The key ecosystem services are associated with biodiversity maintenance as well as erosion control.

Table 13: Goods and services assessment results for wetlands (low=0 and high=4)

Goods and services	**Seep wetland**	Goods and services	**Seep wetland**
Flood attenuation	0.5	Biodiversity Maintenance	2.5
Stream flow regulation	0.5	Water supply	0.0
Sediment trapping	1.5	Natural resources	0.5
Phosphate trapping	1.0	Cultivated foods	0.0
Nitrate removal	1.0	Cultural significance	0.0
Toxicant removal	1.0	Tourism and recreation	0.5
Erosion control	2.0	Education and research	0.0
Carbon storage	0.5		

7. LEGISLATIVE REQUIREMENTS

The proposed development needs to take cognisance of the legislative requirements, policies, strategies, guidelines and principles of the relevant regulatory documents of the Stellenbosch area, as well as the National Water Act, 1998 (NWA) and the National Environmental Management Act (NEMA).

7.1. NEMA AND ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS

NEMA is the overarching piece of legislation for environmental management in South Africa and includes provisions that must be considered to give effect to the general objectives of integrated environmental management. The Act (Act 107 of 1998) provides for the identification of activities that will impact the environment in terms of Section 24. These activities were promulgated in terms of Government Notice No. R. 983, 984 and 985, dated 4 December 2014, as amended by GN 324, GN 325, GN 326 and GN 327 (April 2017), and require environmental authorisation. The impacts of the listed activities must be investigated, assessed and reported to the competent authority before authorisation to commence with such listed activities can be granted. Doug Jeffery Environmental Consultants have been appointed to undertake the environmental authorisation process for the consideration of the works undertaken. This freshwater assessment is required to inform that assessment process.

7.2. NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

The purpose of the NWA is to provide a framework for the equitable allocation and sustainable management of water resources. Both surface and groundwater sources are redefined by the Act as national resources which cannot be owned by any individual, and rights which are not automatically coupled to land rights but for which prospective users must apply for authorisation and register as users. The NWA also provides measures to prevent, control and remedy the pollution of surface and groundwater sources.

The Act aims to regulate the use of water and activities (as defined in Part 4, Section 21 of the NWA), which may impact water resources through the categorisation of 'listed water uses' encompassing water abstraction and flow attenuation within catchments as well as the potential contamination of water resources, where the Department of Water and Sanitation (DWS) is the administering body in this regard. The water uses most likely to be associated with the proposed activities are as follows:

Reference in the NWA	Description	Comment
Section 21(c)	Impeding or diverting flow of water in a watercourse	Works within the watercourses/wetlands are likely to trigger this water use
Section 21(i)	Altering the bed, banks, course or characteristics of a watercourse	Any works within or adjacent to any of the mapped aquatic features is likely to trigger this water use

Defined water use activities require the approval of DWS in the form of a General Authorisation (GA) or Water Use Licence (WUL) if not considered an existing lawful use (a water use that was lawful 2 years before the promulgation of the NWA in 1998) and a Schedule 1 use (small-scale/non-commercial level use). There are restrictions on the extent and scale of listed activities for which GAs apply.

Section 22(3) of the National Water Act allows for a responsible authority (DWS) to dispense with the requirement for a WUL if it is satisfied that the purpose of the Act will be met by the grant of a licence, permit or authorisation under any other law.

GENERAL AUTHORISATION IN TERMS OF SECTION. 39 OF THE NWA

According to the preamble to Part 6 of the NWA, "*This Part established a procedure to enable a responsible authority, after public consultation, to permit the use of water by publishing general authorisations in the Gazette…*" *"The use of water under a general authorisation does not require a licence until the general authorisation is revoked, in which case licensing will be necessary…"*

The GA for Section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks or characteristics of a watercourse) as defined under the NWA was revised in 2016 (Government Notice R509 of 2016). Determining if a water use licence is required for any proposed works within or adjacent to the wetland areas and watercourses is now associated with the risk of degrading the ecological status of that aquatic feature. A low risk of impact could be authorised in terms of a GA. A risk assessment for the works undertaken is included in this report.

REGULATIONS REQUIRING THAT A WATER USER BE REGISTERED, GN R.1352 (1999)

Regulations requiring the registration of water users were promulgated by the Minister of DWA in terms of provision made in section 26(1)(c), read together with section 69 of the National Water Act, 1998. Section 26(1)(c) of the Act allows for registration of all water uses including existing lawful water use in terms of section 34(2). Section 29(1) (b) (vi) also states that in the case of a general authorisation, the responsible authority may attach a condition requiring the registration of such water use. The Regulations (Art. 3) oblige any water user as defined under Section 21 of the Act, to register such use with the responsible authority and effectively apply for a Registration Certificate as contemplated under Art.7(1) of the Regulations.

8. AQUATIC ECOSYSTEM IMPACTS

The activities under consideration in this report relate to the construction of a cableway with a lower base station located at Haute Cabrière wine estate in Franschhoek and an upper station located near the peak of Middagkransberg in the Mont Rochelle Nature Reserve (Figure 15). A ± 30m fire break on the eastern side of the upper station will be required. An access road from Lambrechts Road (R45) to the upper station is initially proposed with three alternative routes but was scoped out as being fatally flawed.

As mentioned in Section 6.2, there are no aquatic features near the proposed cableway and the proposed lower and upper cable stations, with the exception of artificial aquatic habitat at the dam at Haute Cabrière wine estate. The closest natural the aquatic features within the wider study area comprise smaller streams and their associated wetland areas on the backslope of Middagkransberg, as well as some smaller streams that drain the face of the mountain that are more than 350m away from the proposed project activities.

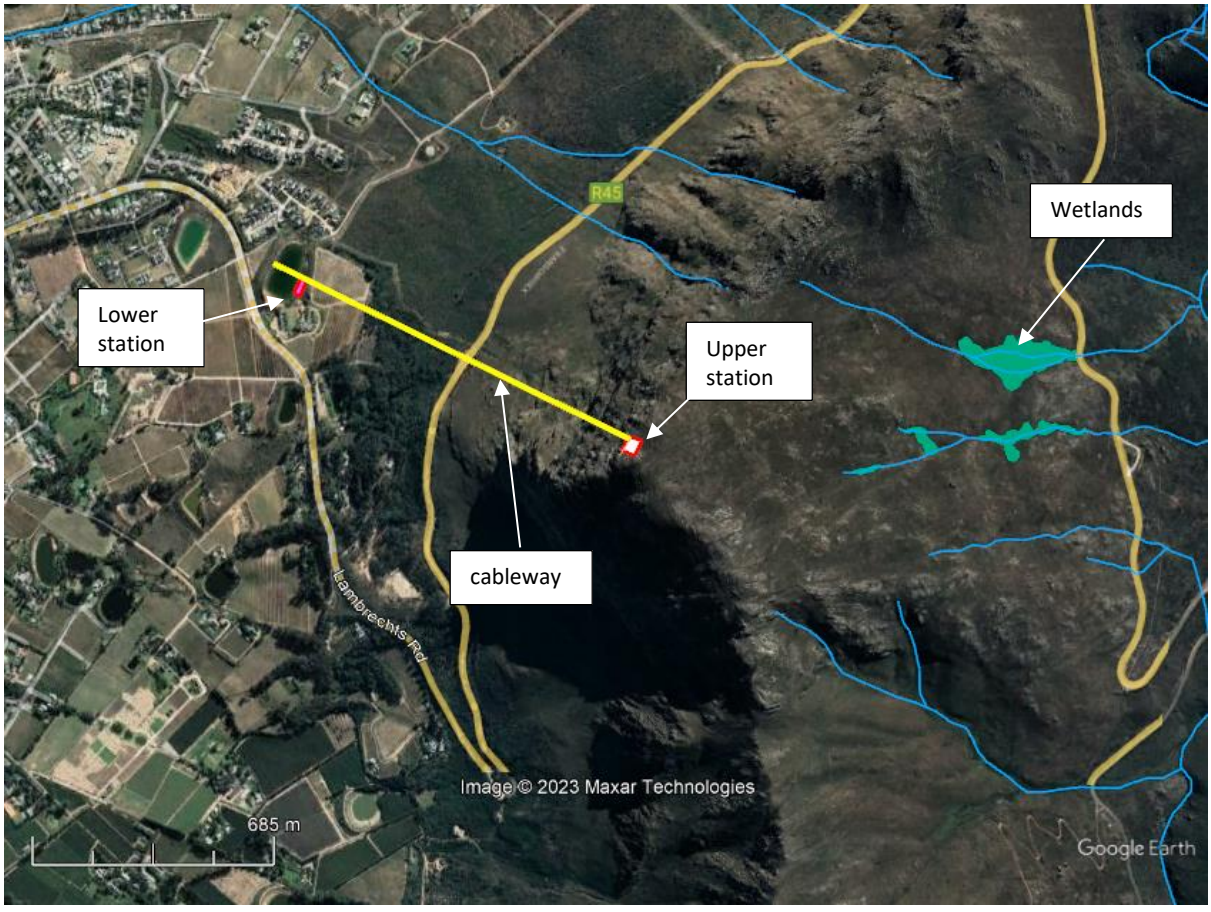


Figure 15. Google Earth image showing the proposed activities and the delineated watercourses and wetlands

Given the above, the only potential aquatic ecosystem impacts for the proposed project are associated with the artificial habitats formed within the off-channel dam at the proposed base station. The proposed alternative locations for the upper station will not result in any change to the potential aquatic ecosystem impact significance.

Significance of impacts without mitigation: Considering that the only aquatic habitat near the proposed activities that is likely to be impacted comprises artificial habitat associated with an off-channel dam, the significance of the aquatic impact of the works proposed is considered of low significance.

Proposed mitigation:

The services associated with the proposed cableway, and in particular, the sewage, water supply, solid waste and stormwater management, should be adequately addressed to minimise any potential impact on the adjacent water resources, either in terms of:

- water contamination from sewage (sewage should be stored, evacuated to an approved treatment works, treated to an acceptable quality and responsibly disposed of);
- prevention of erosion from concentrated runoff created as a result of the development (a stormwater management plan should be compiled to address this);
- Increased litter in natural areas (solid waste management measures should be in place); or
- the stress placed on the available water supply to the property (water conservation measures should minimise the additional water requirement for the proposed development).

Access to the upper cable station will result in increased disturbance of an area currently largely natural. This has the potential to result in the establishment of new paths in this area with increased disturbance of the area (with an associated erosion and sedimentation risk to the nearby aquatic features) as well as a potential increased risk of littering. This aspect should be addressed in the development proposal either to prevent the creation of new pathways or to provide some formal paths on the mountaintop.

To protect the aquatic features on the backslope of the Middagkransberg from any adjacent development activities, a buffer of 35m from the edge of the watercourse and 75m from the edge of the wetland areas is recommended.

Significance of impacts after mitigation: With the mitigation measures provided above, the significance of the impact is likely to be reduced to very low to negligible.

Impact Table:

Potential impact and risk:	Proposed cableway development	No-go Alternative
Construction		
Nature of impact:	Disturbance of aquatic habitat; flow and water quality modification	None
Status	Negative	Neutral
Duration of impact:	Short Term	-
Extent	Localised	-
Magnitude/Intensity	Low	-
Consequence of impact or risk:	Low	-
Probability of occurrence:	Unlikely	-
Degree impact may cause irreplaceable loss of resources:	No loss	-
Degree impact can be reversed:	High	-
Indirect impacts:	-	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation	Low	-
Degree impact can be avoided:	High	-
Degree impact can be managed:	High	-
Degree impact can be mitigated:	High	-
Proposed mitigation:	See above	-
Residual impacts:	None	-
Cumulative impact post mitigation:	Very Low to negligible	-
Significance rating of impact after mitigation	Negligible	-
Confidence	High	High
Operation		

Nature of impact:	Disturbance of aquatic habitat; flow and water quality modification	None
Status	Negative	Neutral
Duration of impact:	Long Term	-
Extent	Localised	-
Magnitude/Intensity	Low	-
Consequence of impact or risk:	Low	-
Probability of occurrence:	Unlikely	-
Degree impact may cause irreplaceable loss of resources:	No loss	-
Degree impact can be reversed:	High	-
Indirect impacts:	-	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation	Low	-
Degree impact can be avoided:	High	-
Degree impact can be managed:	High	-
Degree impact can be mitigated:	High	-
Proposed mitigation:	See above	-
Residual impacts:	None	-
Cumulative impact post mitigation:	Very Low to negligible	-
Significance rating of impact after mitigation	Negligible	-
Confidence	High	High

9. RISK ASSESSMENT

The risk of the proposed activities on associated aquatic ecosystems is considered to be negligible. A risk assessment for the proposed project is therefore not deemed to be necessary.

No water use authorisation in terms of Section 21(c) and (i) is thus deemed to be required.

10. CONCLUSIONS AND RECOMMENDATIONS

there are no aquatic features near the proposed cableway and the proposed lower and upper cable stations, with the exception of artificial aquatic habitat at the dam at Haute Cabrière wine estate. The closest natural the aquatic features within the wider study area comprise smaller streams and their associated wetland areas on the backslope of Middagkransberg, as well as some smaller streams that drain the face of the mountain that are more than 350m away from the proposed project activities.

Given the above, the only potential aquatic ecosystem impacts are associated with the artificial habitats formed within the off-channel dam at the proposed base station. The proposed alternative locations for the upper station will not result in any change to the potential aquatic ecosystem impact significance.

With the mitigation, the significance of the impact of the proposed activities is likely to be very low to negligible. The following mitigation measures are recommended:

The services associated with the proposed cableway, and in particular, the sewage, water supply, solid waste and stormwater management, should be adequately addressed to minimise any potential impact on the adjacent water resources, either in terms of:

- water contamination from sewage (sewage should be stored, evacuated to an approved treatment works, treated to an acceptable quality and responsibly disposed of);

- prevention of erosion from concentrated runoff created as a result of the development (a stormwater management plan should be compiled to address this);
- Increased litter in natural areas (solid waste management measures should be in place); or
- stress placed on the available water supply to the property (water conservation measures should minimise the additional water requirement for the proposed development).

Access to the upper cable station will result in increased disturbance of an area currently largely natural. This has the potential to result in the establishment of new paths in this area with increased disturbance of the area (with an associated erosion and sedimentation risk to the nearby aquatic features) as well as a potential increased risk of littering. This aspect should be addressed in the development proposal either to prevent creation of new pathways or to provide some formal paths on the mountaintop.

To protect the aquatic features on the backslope of the Middagkransberg from any adjacent development activities, a buffer of 35m from the edge of the watercourse and 75m from the edge of the wetland areas is recommended.

The risk of the proposed activities on associated aquatic ecosystems is considered to be negligible. A risk assessment for the proposed project is therefore, not deemed to be necessary. No water use authorisation in terms of Section 21(c) and (i) is thus deemed to be required.

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APPENDIX A: SPECIALIST DETAILS, EXPERTISE AND DECLARATION

1.1. QUALIFICATIONS OF SPECIALIST CONSULTANT

Name:	Antonia Belcher
Contact details:	53 Dummer St, Somerset West, 7130; Phone: 082 883 8055; Email: toni@bluescience.co.za
Profession:	Aquatic Scientist (P. Sci. Nat. 400040/10)
Fields of Expertise:	Specialist in freshwater assessments, monitoring and reporting
Years in Profession:	30+ years

Toni Belcher worked for the Department of Water Affairs and Forestry for more than 17 years. During this period she worked for the Directorate Water Quality Management, the Institute for Water Quality Studies and the Western Cape Regional Office and has built up a wide skills base on water resource management and water resource quality for rivers, estuaries and the coastal marine environment. Since leaving the Department in 2007, she has been working in her private capacity and was co-owner of BlueScience (Pty) Ltd, working in the field of water resource management and has been involved in more than 500 aquatic ecosystem assessments for environmental impact assessment and water use authorisation purposes. In 2006 she was awarded a Woman in Water award for Environmental Education and was a runner up for the Woman in Water prize for Water Research.

Professional Qualifications:

1984 Matriculation Lawson Brown High School
1987 B.Sc. – Mathematics, Applied Mathematics University of Port Elizabeth
1989 B.Sc. (Hons) – Oceanography University of Port Elizabeth
1998 M.Sc. – Environmental Management (cum laude) Potchefstroom University

Key Skills: Areas of specialisation: Aquatic ecosystem assessments, Monitoring and evaluation of water resources, Water resource legislation and authorisations, River classification and Resource Quality Objectives, River Reserve determination and implementation, Water Quality Assessments, Biomonitoring, River and Wetland Rehabilitation Plans, Catchment management, River maintenance management, Water education.

Summary of Experience:

1987 – 1988	Part-time field researcher, Department of Oceanography, University of Port Elizabeth
1989 – 1990	Mathematics tutor and administrator, Master Maths, Randburg and Braamfontein Colleges, Johannesburg
1991 – 1995	Water Pollution Control Officer, Water Quality Management, Department of Water Affairs, Pretoria
1995 – 1999	Hydrologist and Assistant Director, Institute for Water Quality Studies, Department of Water Affairs and Forestry, Pretoria
1999 – 2007	Assistant and Deputy Director, Water Resource Protection, Western Cape Regional Office, Department of Water Affairs, Cape Town
2007 – 2012	Self-employed – Aquatic Specialist
2013 – 2020	Senior Aquatic Specialist and part-owner, BlueScience
2020 – present	Self-employed– Aquatic Specialist

1.2. DECLARATION OF INDEPENDENCE

I, A**ntonia Belcher,** as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
    - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
    - ~~am not independent, but another specialist that meets the general requirements set out in Regulation 13 of GN No. 326 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);~~
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the Applicant, the Department and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations, 2014 (as amended).

Date: 31 January 2023

Name of company: -

Signature of the specialists: