

From the analysis undertaken in the avifaunal impact assessment, Alternative 1 is the preferred alignment from a bird interaction perspective.

Mammals

Large mammals have to a large extent been removed from the area and the only indication of large mammal species that could have previously occurred in the area are re-introduced mammals found on a few game farms and lodges encountered during the site visit. These include Springbok (*Antidorcas marsupialis*), Blesbok (*Damaliscus dorcas phillipsi*), Blue Wildebeest (*Connochaetes taurinus*) and Burchell's Zebra (*Equus burchelli*). During the site visit, Yellow Mongoose (*Cynictis pencilata*) were spotted as well as signs of other small mammals such as droppings. Other small mammals known to occur in the area include Hedgehog (*Atelerix frontalis*), Striped Polecat (*Ictonyx striatus*), Suricate / Meerkat (*Suricata suricatta*), Aardvark / Antbear (*Orycteropus afer*) and the ubiquitous rats and mice. Sensitive mammal species that could occur in the quarter degree square 2529CD include *Genetta tigrina* (Large-spotted Genet), *Lepus saxatilis* (Scrub hare), *Hyaena brunnea* (Brown Hyaena), *Sylvicapra grimmia* (Common/Grey Duiker), *Tragelaphus scriptus* (Bushbuck), *Vulpes chama* (Cape Fox) None of these species were identified on site.

7.1.10 Wetland and Riparian Zone Delineation

Riparian Zones vs. Wetlands

Wetlands

The riparian zone and wetlands were delineated according to the Department of Water Affairs and Forestry (DWAF) guideline, 2003: A practical guideline procedure for the identification and delineation of wetlands and riparian zones. According to the DWAF guidelines a wetland is defined by the National Water Act as:

“land which is transitional between terrestrial and aquatic systems where the water table is usually at or near 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.”

In addition the guidelines indicate that wetlands must have one or more of the following attributes:

- Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation;
- The presence, at least occasionally, of water loving plants (hydrophytes); and
- A high water table that results in saturation at or near surface, leading to anaerobic conditions developing in the top 50 centimetres of the soil.

During the site investigation the following indicators of potential wetlands were identified:

- Terrain unit indicator;
- Soil form Indicator;
- Soil wetness indicator; and

- Vegetation indicator.

Riparian Areas

According to the DWAF guidelines a riparian area is defined by the National Water Act as:

“Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas”

The difference between Riparian Areas and Wetlands

According to the DWAF guidelines the difference between a wetland and a riparian area is:

“Many riparian areas display wetland indicators and should be classified as wetlands. However, other riparian areas are not saturated long enough or often enough to develop wetland characteristics, but also perform a number of important functions, which need to be safeguarded... Riparian areas commonly reflect the high-energy conditions associated with the water flowing in a water channel, whereas wetlands display more diffuse flow and are lower energy environments.”

Delineation

The site was investigated for the occurrence of wetlands and riparian areas, using the methodology described above and described in more detail in the DWAF guidelines.

Terrain Unit Indicator

The terrain on site varies from 1600 mamsl to 1520 mamsl as illustrated in Figure 24. From Figure 24 it can be seen that the site is located in an area of undulating hills with the dominant terrain units on site being the midslope, footslope and valley bottom units. According to the DWAF guidelines the valley bottom is the terrain unit where wetlands are most likely to occur, but they are not excluded from any of the other terrain units.

Soil Form Indicator

The site is located on a slope that drains towards the Witbank Dam. Water enters the soils profile and then flows through the profile down-slope. This action of water movement through the slope typifies the soils of the largest part of the site (eluvial and plinthic soils). Closer to the dam (within the valley bottom terrain unit) the soils gradually deepen due to the down-slope transport of soil (colluvium). In addition these soils have gradually higher percentages of clays that over time have been washed down-slope and accumulate at the valley bottom where the slope angle reduces. The detailed soil mapping exercise was limited to the footslope and valley bottom area in order to delineate the wetland / riparian zones.

During a three day site visit the soils on site were identified (Refer to Section 3.5). Of the soils identified on site the Katspruit soil form is indicative of the permanent wetland zone.

Soil Wetness Indicator

The soils on site were subjected to a soil wetness assessment. If soils showed signs of wetness within 50 cm of the soil surface, it was classified as a hydromorphic soil and divided into the following groups:

Temporary Zone

- Minimal grey matrix (<10%);
- Few high chroma mottles; and
- Short periods of saturation.

Seasonal Zone

- Grey matrix (>10%);
- Many low chroma mottles present; and
- Significant periods of wetness (>3 months / annum).

Permanent Zone

- Prominent grey matrix;
- Few to no high chroma mottles;
- Wetness all year round; and
- Sulphuric odour.

The Katspruit soil form had signs of wetness within the top 50 cm of the soil profile. The Katspruit soil form was classified as the permanent zone, the temporary and seasonal zone could not be delineated since the soil forms diagnostic of these zones probably occur at a depth greater than that of the soil auger used. Therefore, while the temporary and seasonal zones could not be delineated, they are still likely to occur. The soil forms are illustrated in Figure 25.

Vegetation Indicator

The vegetation units on site are described above and illustrated in Figure 22. The vegetation found in the Undisturbed/Natural Grassland and the Riparian and Wetland zone vegetation units both have species present to indicate the presence of wetlands.

Wetlands and Buffer Zones

According to the methodology that was followed for delineation of wetlands by DWAF, the permanent zone classifies as a wetland present on site. It should however be noted that several of the so-called wetlands could also be classified as riparian zones as they follow the drainage path of the non-perennial streams on site. All the areas identified above perform critical ecosystem functions and also provide habitat for sensitive species. It is suggested that a 50 m buffer be placed from the edge of the permanent zone in order to sufficiently protect the wetlands and riparian zones. Figure 24 above illustrates the various wetland zones as well as the buffer placed along the edge of the permanent zone. From the figure it is once again clear that Alternative 1 is the best alignment, as it avoids most of the sensitive wetlands as well as the buffer zones.

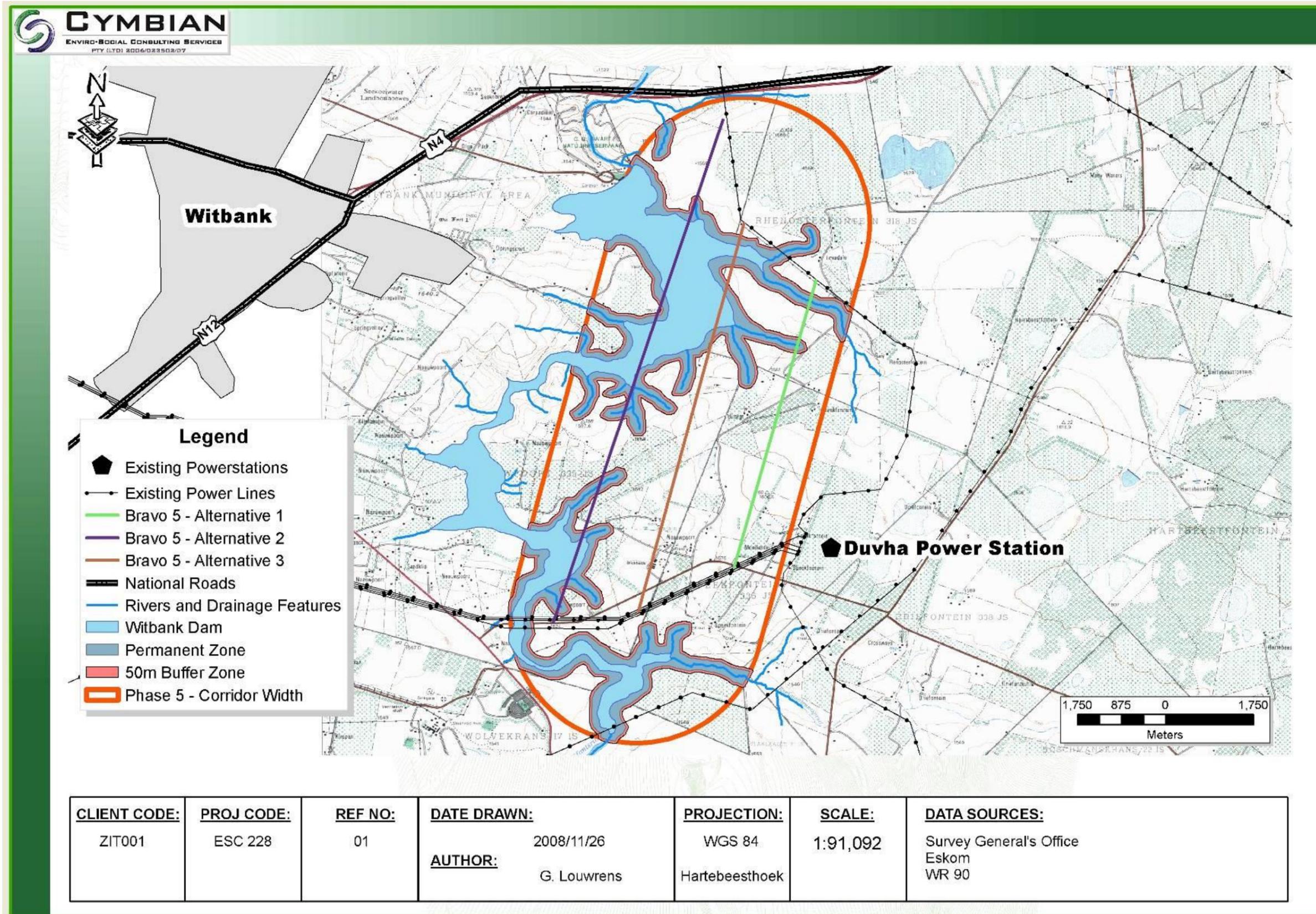


FIGURE 24: WETLAND AND RIPARIAN ZONES.

7.1.11 Biodiversity Rating

In order to quantify the sensitivity of the fauna, flora and wetlands, a biodiversity assessment is undertaken.

Biodiversity Assessment Methodology

Each vegetation unit and its associated fauna were subjected to a biodiversity assessment according to the following methodology. The biodiversity of an area is measured as a combination of the variety of species and habitats within the area, as well as the ecological processes and functional value of the site. This can be captured in two broader categories namely conservation status and functional status. The conservation status encompasses species diversity, habitat diversity and ecological processes. The functional status encompasses ecological services and human use services.

It is suggested, due to the number of variables to be considered, that the following scoring system is used to first determine the value of each of the components (conservation status and functional status) from which the overall biodiversity value is determined.

Conservation status

The conservation status of a particular habitat / vegetation unit is determined using the methodology described in Table 10 below. The conservation status encompasses species diversity, habitat diversity and ecological processes. Each of the habitats found on site are rated accordingly below.

TABLE 10: CONSERVATION STATUS DETERMINATION

A. How much of the larger vegetation type or system of which the defined area is a representative example, still exists?	Rating
Only a small area still exists (< 500 km ²)	5
A moderate area still exists (500 to 1000 km ²)	3
A large areas still exist (> 1000 km ²)	1
B. What is (based on a qualitative assessment) the species and habitat diversity of the defined area?	Rating
Noticeably high	5
Difficult to assess	3
Obviously low	1
C. What is the condition (qualitative assessment) of the defined area?	Rating
Pristine and largely undisturbed	5
Moderately disturbed	3
Highly disturbed	1

The possible results for the conservation status of the defined area are based on a combination of the attributes, as follows.

$$A \text{ (Size)} + B \text{ (Diversity)} + C \text{ (Condition)} = \text{Conservation Status}$$

Based on the combined score, the conservation status can range from very high to low, as described below in Table 11:

TABLE 11: CONSERVATION STATUS RATING

Conservation Status	Rating
High conservation status, needs to be maintained and improved	11 – 15
Moderate conservation status, heavily disturbed and will require improvement	6 – 10
Low conservation status, heavily reduced and of limited value.	3 – 5

Functional status

The functional status encompasses ecological services and human use services. All these elements are rated according to the methodology described in Table 12 below. A detailed rating of each habitat is given below.

TABLE 12: FUNCTIONAL STATUS DETERMINATION

A. Are there currently any signs of obvious recreational use of the area, such as walking/hiking, bird watching, mountain biking, fishing, etc?	Rating
Obvious signs of regular use	5
Signs of periodic use	3
No noticeable signs of use	1
B. Does the area carry out any ecological service, such as water purification, flood attenuation, riverbank stabilisation, soil stabilisation, etc?	Rating
Has an obvious functional role	5
Difficult to determine its functional role	3
Clearly has no to very limited functional role	1
C. Does the area serve an aesthetic role?	Rating
Forms part of a larger landscape that is widely visible and has a high aesthetic appeal	5
Forms part of a landscape that has high aesthetic appeal but which is not widely visible	3
Forms part of a landscape that has low aesthetic appeal	1

The possible results for the functional status of the defined area are based on a combination of the attributes, as follows.

$$A \text{ (recreational use)} + B \text{ (ecological service)} + C \text{ (aesthetic value)} = \text{Functional Status}$$

Based on the combined score, the functional status can range from very high to low as illustrated in Table 13 below:

TABLE 13: FUNCTIONAL STATUS RATING

Functional Status	Rating
High service value	11 – 15
Moderate service value	6 – 10
Low service value	3 – 5

Biodiversity value

The perceived biodiversity value of an area to human development is not always easy to describe, but it includes the natural system and its variety of species, the ecological processes and the service or functional value that it provides. The combination of the conservation status and functional status scores provides a ranking of the overall biodiversity value for a defined area, as shown in the matrix in Table 14 below.

TABLE 14: BIODIVERSITY VALUE RATING

Conservation status	Functional status		
	High service value	Moderate service value	Low service value
High	High	High	Moderate
Moderate	Moderate	Moderate	Low
Low	Moderate	Low	Low

Biodiversity Rating

The following vegetation units were identified on site:

- Undisturbed/Natural grassland;
- Disturbed/Grazed Grassland; and
- Wetland and Riparian zones.

Each of the abovementioned vegetation units are rated for their biodiversity value below.

Undisturbed/Natural grassland

This vegetation unit has a **high** biodiversity rating as indicated in Table 15 **Error! Reference source not found.** below. The **high** conservation value is attributed to the high grassland species diversity in the unit and the large area of grassland not conserved remaining. The **high** functional rating is attributed to the obvious ecological services and the high aesthetic value of the grassland.

TABLE 15: BIODIVERSITY RATING FOR THE *UNDISTURBED/NATURAL GRASSLAND UNIT*

Conservation status	Size of vegetation unit	Species diversity	Condition
	3 – Moderate	5 - High	3 – Moderately Disturbed
Functional status	Use	Ecological service	Aesthetic value
	3 – Periodic	5 – Obvious	5 - High
Biodiversity Rating	Conservation status	Functional status	Biodiversity
	11 – High	13 - High	High

Disturbed/Grazed Grassland

This vegetation unit has a **moderate** biodiversity rating as indicated in Table 16 below. The **moderate** conservation value is attributed to the moderate grassland species diversity in the unit and the moderate area of moist grassland remaining. The **moderate** functional rating is attributed to the moderate ecological service and the moderate aesthetic value of this grassland.

TABLE 16: BIODIVERSITY RATING FOR THE *DISTURBED/GRAZED GRASSLAND UNIT*

Conservation status	Size of vegetation unit	Species diversity	Condition
	3 – Moderate	3 - Moderate	3 – Moderately Disturbed
Functional status	Use	Ecological service	Aesthetic value
	3 – Periodic	3 – Difficult to determine	3 - Moderate
Biodiversity Rating	Conservation status	Functional status	Biodiversity
	9 – Moderate	9 - Moderate	Moderate

Wetland and Riparian zones

This vegetation unit has a **high** biodiversity rating as indicated in Table 17 below. The **high** conservation value is attributed to the high grassland species diversity in the unit and the small area of wetlands remaining. The **high** functional rating is attributed to the obvious ecological services and the high aesthetic value of the wetlands and seepage areas.

TABLE 17: BIODIVERSITY RATING FOR THE *SEEPAGE AREAS AND WETLANDS*

	Size of vegetation unit	Species diversity	Condition
Conservation status	5 – Small	5 – High	3 – Moderately Disturbed
Functional status	Use	Ecological service	Aesthetic value
	1 – none	5 – Obvious	5 - High
Biodiversity Rating	Conservation status	Functional status	Biodiversity
	13 – High	11 - High	High

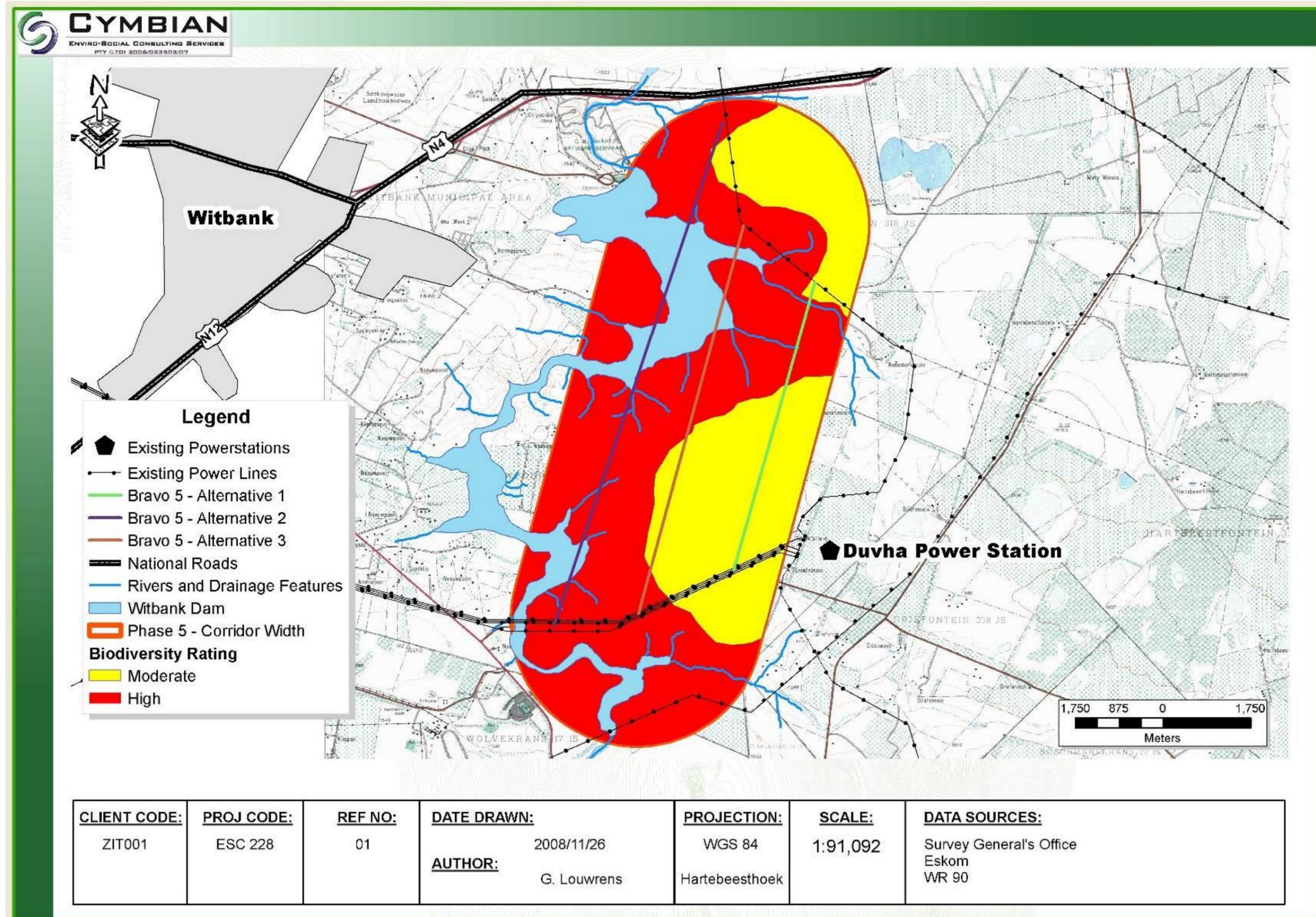


FIGURE 25: BIODIVERSITY RATING.

7.1.12 Visual

The site and surrounding area may be characterised as agricultural land utilised mainly for the grazing of cattle. The topography of the region and study site is gently undulating to moderately undulating landscape of the Highveld plateau.

The proposed power lines are located in the area north-west of the Duvha Power Station with the power station and other existing power lines featuring prominently in the landscape. The Witbank Dam and its associated drainage features represent other significant features in the landscape.

Methodology

The methodology adopted for the visual assessment includes the following tasks:

- Examine the baseline information (contours, building dimensions, vegetation, inter alia);
- Determine the area from which any of the upgrade may be visible (viewshed);
- Identify the locations from which views of the upgrade may be visible (observation sites), which include buildings and roads; and
- Analyse the observation sites to determine the potential level of visual impact that may result from the upgrade.

Each component of the assessment process is explained in detail in the following sections of the Report.

The Viewshed

The viewshed represents the area from which the proposed site would potentially be visible. The extent of the viewshed is influenced primarily by the combination of topography and vegetation, which determine the extent to which the site would be visible from surrounding areas.

The viewshed was determined by Cymbian through the following steps and presumptions:

- The likely viewshed was determined by desktop study (ArcGIS) using contour plans (20 m interval); and
- An offset of 2 m (maximum) for the observer and an offset of 30 m (maximum) for the proposed power lines were utilized during the spatial analysis.

Visibility Assessment

Site visibility is an assessment of the extent to which the proposed upgrade would potentially be visible from surrounding areas. It takes account of the context of the view, the relative number of viewers, duration of view and view distance.