Royal HaskoningDHV

Draft Environmental Basic Assessment Report for the Proposed Rehabilitation of Rietspruit Dam, near Ventersdorp, North West Province.

Client: National Department of Water and Sanitation

Date: November 2015

environmental affairs
Department:
Environmental Affairs
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File Reference Number:	
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Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
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7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
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11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? YES NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

1. PROJECT DESCRIPTION

The National Department of Water and Sanitation is proposing to rehabilitate the Rietspruit Dam situated on the farm Flakfontein IP 213 and 214 and located approximately 10km from the town of Ventersdorp, North West Province (refer to Figure 1). The main purpose of the rehabilitation is to make the dam safe in terms of the Dam Safety Regulations and Chapter 12 of the 1998 National Water Act. The construction activities will take place in an area that is approximately 5 hectares in size (refer to Figure 2) and will entail the following activities:

- Infilling and deposition of approximately 10 000 cubic meters of borrow material to stabilise the downstream face of the dam embankment.
- Approximately 100 m^3 of silt is to be dredged from the reservoir in order to open the river outlet valve's inlet.
- Widening the cross-section footprint of the dam by 3.5 to 7m along the length of the dam wall. The total increase in the footprint of the dam will be approximately 4000 m^2.
- The footprint of the earth dam embankment will be increased by approximately 6 meters in width on average, but the length will be unaltered.

The infill material will be sourced commercially from the Witpoort and Sandstone quarry which is approximately 20 km away from the Rietspruit Dam. This quarry is operating with all relevant environmental permits in place **(Appendix F).**

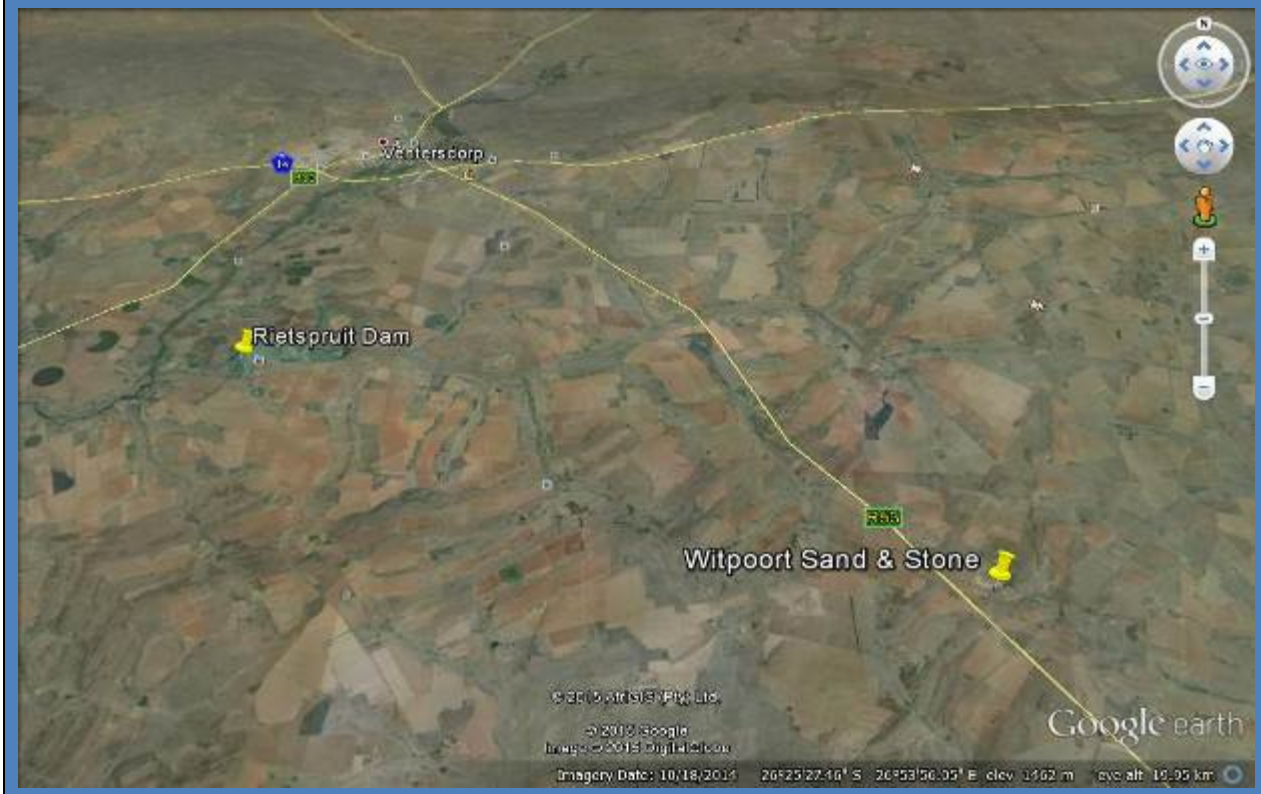


Figure 1: Locality Map

Figure 2: Extent of Construction Area (highlighted in red).

2. RECEIVING ENVIRONMENT

2.1. Climatic Conditions

Ventersdorp normally received an average of 522 mm of rain per year between 2000 and 2012, with most rainfall occurring during mid-summer. Figure 3 indicates the average rainfall values for Ventersdorp per month. It receives the lowest rainfall (3 mm) in July and the highest (90 mm) in January. The monthly distribution of average daily maximum temperatures indicates the average mid-day temperatures for Ventersdorp range from 17°C in June to 29°C in January (refer to Figure 4). The region is the coldest during June when the mercury drops to 1°C on average during the night.

Rehabilitation works at the dam site are planned for the winter months of 2016 when the impacts of rainfall will be least felt.

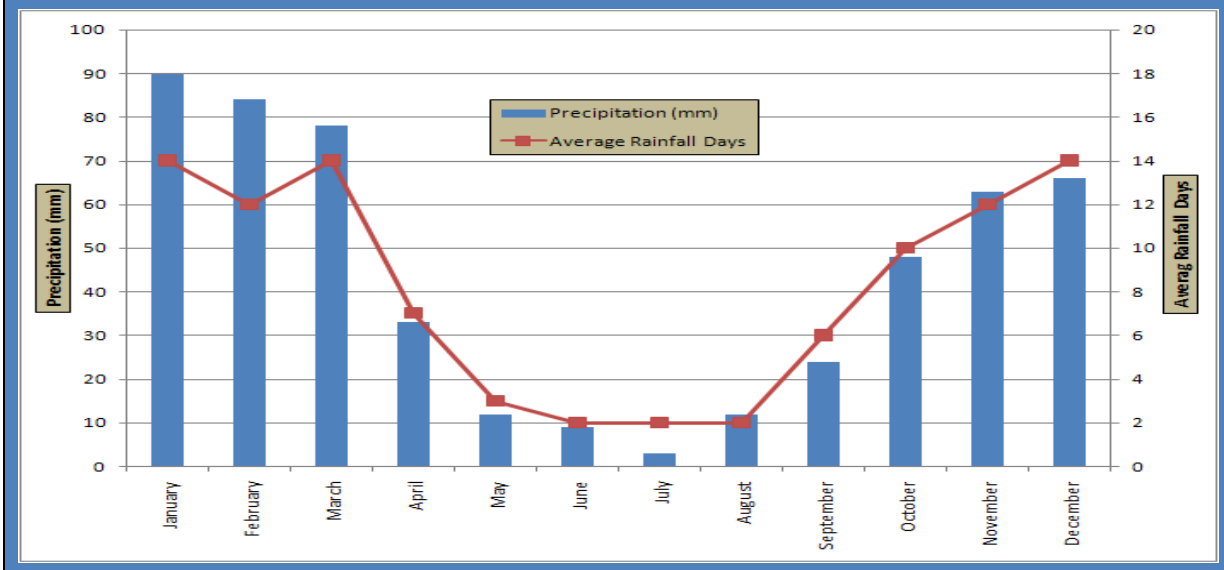


Figure 3: Rainfall Data (averages) for Ventersdorp, North-West Province (2000 – 2012).

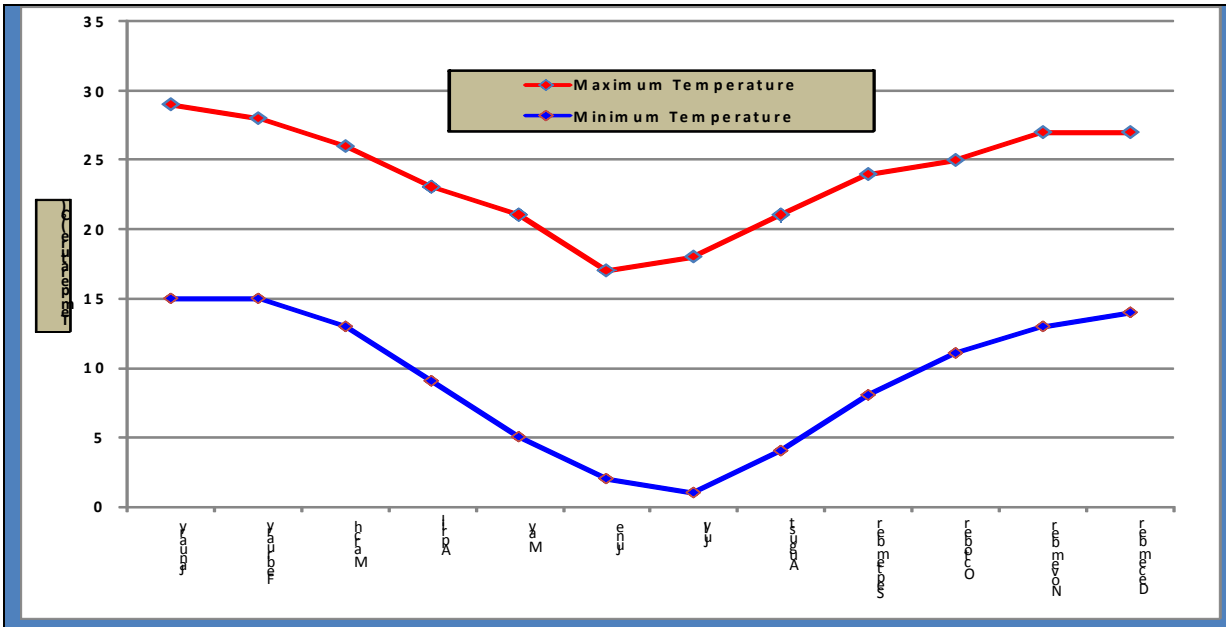


Figure 4: Temperature Data (averages) for Ventersdorp, North-West Province (2000 – 2012).

2.2. Land Cover

Land use often determines land cover; it is an important factor contributing to the condition of the land. Different uses have varying effects on the integrity of the land. Ventersdorp Local Municipality is situated within the Kenneth Kaunda District Municipality and comprises 376 405 ha, of which 246 385 ha is currently untransformed (65.5 % of the municipality) (BGIS, 2007). A brief appraisal of available ENPAT data indicates that the major anthropogenic transformation activity in the immediate region of the study site is commercial agriculture, which is supported by irrigation practices from the Rietspruit Dam. Remaining areas within the surrounds comprises of grasslands where intensive cattle grazing is practiced (refer to Figure 5).

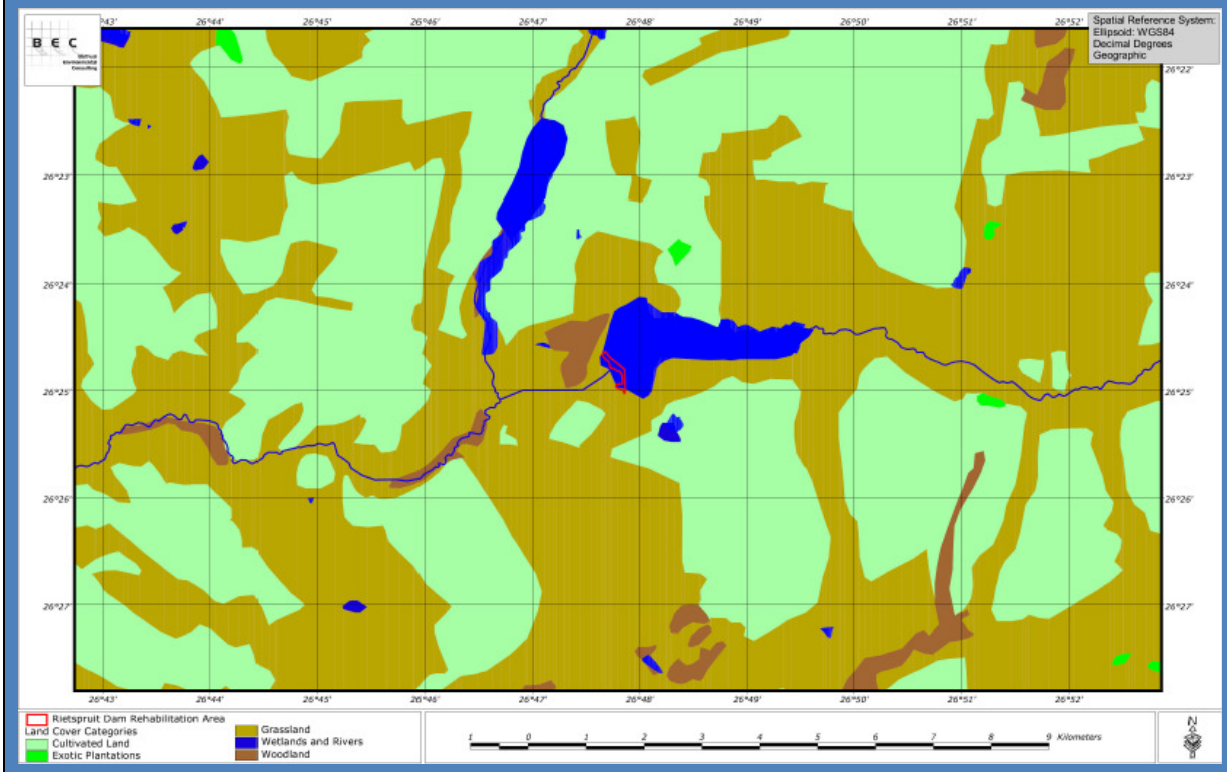


Figure 5: Land Cover Categories of the Immediate Region

2.3. Biodiversity

2.3.1. Regional Conservation Planning

The North West Province Biodiversity Conservation Assessment (NWPBCA, Version 1.2; Desmet, et. al., 2009) provides for a strategic categorisation of biodiversity attributes of the region, based on a conservation assessment of the North West Province. This assessment is used to inform the development of the Provincial Biodiversity Sector Plans, bioregional plans, and also be used to inform the development of Spatial Development Frameworks (SDFs), Environmental Management Frameworks (EMFs), Strategic Environmental Assessments (SEAs) and in the Environmental Impact Assessment (EIA) process for projects in the Province. This report also forms the basis, through mapping of critical biodiversity areas (CBAs), for the development of a Biodiversity Sector Plan document in line with the South African National Biodiversity Institute's (SANBI's) guidelines on the development of bioregional plans.

CBAs are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services (SANBI 2007). These form the key output of a systematic conservation assessment approach and are the biodiversity sector's inputs into multi-sectorial planning and decision making tools. Ecological support areas (ESAs) represent landscape sections that are not essential for meeting biodiversity representation targets/thresholds, but which play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas.

Figure 6 provides an illustration of the spatial representation of CBAs within the immediate region of the dam rehabilitation project area. The NWPBCA indicates that the proposed project site is situated within a CBA Category 2 area, comprising of conservation important Vaal-Vet Sandy Grassland (Endangered). Category 2 areas include parts of 'Near-natural landscapes' where:

- Ecosystems and species are largely intact and undisturbed;
- Areas with intermediate irreplaceability or some flexibility in terms of areas required to meet biodiversity targets. There are options for the loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets; and
- These are landscapes that are approaching but have not passed their limits of acceptable change.

Ideally, these parts of the landscape need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. For CBAs, the impact on biodiversity of a change in land-use that results in a change from the desired ecological state is most significant locally at the point of impact through the direct loss of a biodiversity feature (e.g. loss of a populations or habitat). Fortunately, due to the small size of the proposed project, it is unlikely that natural habitat will be lost or adversely affected.

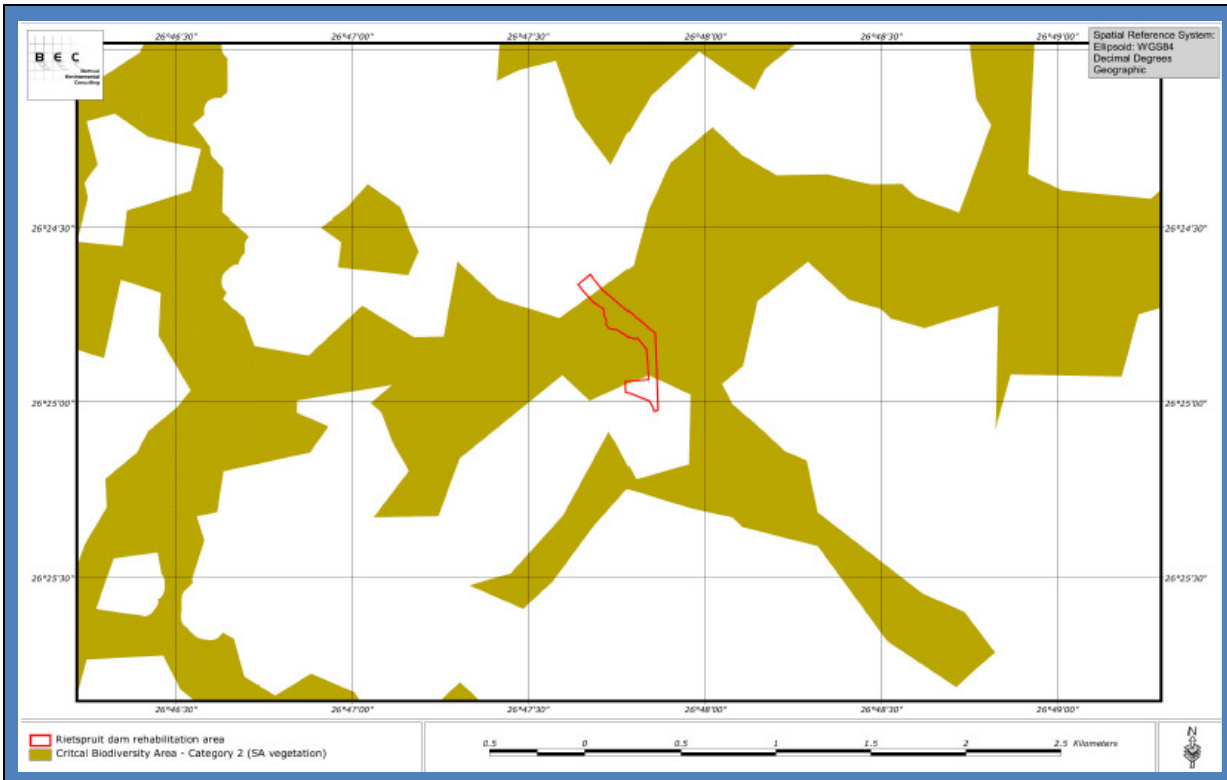


Figure 6: Illustration of Conservation Planning Categories on a Regional Scale near Dam Rehabilitation Area.

2.3.2. Floristic Characterisation

The study site is spatially situated in the Dry Highveld Grassland Bioregion that is situated on the extensive central plateau of South Africa. The topography is flat to undulating, occasionally broken by small mountains or hills, typically found in the Free State, or incised river valleys, such as the Orange, Vaal and Olifants Rivers. The major environmental factor controlling vegetation patterns and the recognition of different vegetation types is annual rainfall, which forms an east to west gradient of decreasing moisture across the Highveld. Dry Highveld Grassland prevails in the western regions of the Grassland Biome where the mean annual precipitation (MAP) is below 600 mm per annum; these grasslands therefore fall into the 'sweet' grassland type with a predominance of chloridoid grasses.

Mucina and Rutherford (2006) characterise the ecological type as the Vaal-Vet Sandy Grassland (Mucina & Rutherford, 2006; refer to Figure 7). This type is situated in the North-West and Free State Provinces, south of Lichtenburg and Ventersdorp, stretching southwards to Klerksdorp, Leeudoringstad, Bothaville and to the Brandfort area north of Bloemfontein. The topography is a plains-dominated landscape with some scattered, slightly irregular undulating plains and hills. Vegetation is mainly low-tussock grasslands with an abundant karroid element. The dominance of Themeda triandra is an important feature of this vegetation unit. Locally, low cover of T triandra is associated with an increase in Elionurus muticus, Cymbopogon pospischilii and Aristida congesta, frequently attributed to heavy grazing and/or erratic rainfall. Nationally, the conservation status is regarded as Endangered, implying an ecosystem that has undergone significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems. Only 0.3 % of this ecological type is statutorily conserved at the Bloemhof Dam, Schoonspruit, Sandveld, Faan Meintjies, Wolwespruit and Soetdoring Nature Reserves. More than 63 % is currently transformed for cultivation (ploughed for commercial crops) and the rest under strong grazing pressure from cattle and sheep. The endemic species Lessertia phillipsiana is known to persist in this vegetation type. Important taxa include the following:

- Graminoids - Anthephora pubescens, Aristida congesta, Chloris virgata, Cymbopogon caesius, C. pospischilii, Cynodon dactylon, Digitaria argyrograpta, D. eriantha, Elionurus muticus, Eragrostis chloromelas, E. lehmanniana, E. plana, E. trichophora, E. curvula, E. obtusa, E. superba, Heteropogon contortus, Panicum coloratum, P. gilvum, Setaria sphacelata, Themeda triandra, Tragus berteronianus, Brachiaria serrata, Pogonarthria squarrosa, Trichoneura grandiglumis and Triraphis andropogonoides.

- Herbs - Stachys spathulata, Barleria macrostegia, Berkheya onopordifolia var. onopordifolia, Chamaesyce inaequilatera, Geigeria aspera var. aspera, Helichrysum caespititium, Hermannia depressa, Hibiscus pusillus, Monsonia burkeana, Rhynchosia adenodes, Selago densiflora and, Hilliardiella oligocephala.
- Geophytic Herbs - Bulbine narcissifolia and Ledebouria marginata.
- Succulent Herb - Tripteris aghillana var. integrifolia
- Low Shrubs - Felicia muricata, Pentzia globosa, Anthospermum rigidum subsp. pumilum, Helichrysum dregeanum, H. paronychioides and Ziziphus zeyheriana.

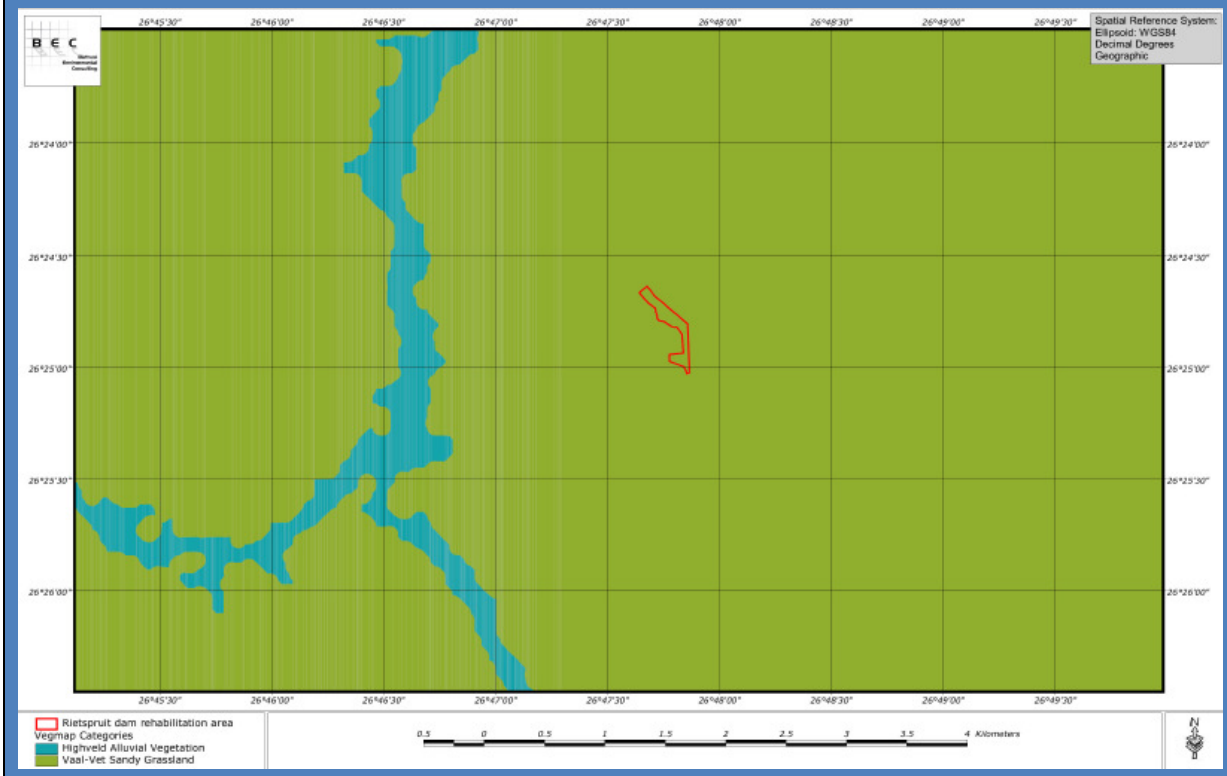


Figure 7: Illustration of Regional Vegetation Context of the Study Site

2.3.3. Plants of Conservation Concern

The SANBI info-base for the 2626BD ¼-degree grid indicates the known presence of only one (1) species of conservation concern within the immediate region, namely Cleome conrathii (Near threatened). Similar to the regional phyto-diversity, this low number reflects the paucity of floristic knowledge, rather than the true absence of plant taxa of conservation concern from the area. It is highly likely that, with a more detailed assessment of the region, numerous plants of conservation concern will be recorded. Taking cognisance of habitat types and status, the likelihood of plants of conservation concern persisting in the immediate vicinity cannot be totally excluded at this stage of the process.

The presence of the Declining geophyte Crinum bulbispermum was recorded within the proposed rehabilitation area, more specifically at the interface of the dam wall and the dam itself. Crinum species are threatened by harvesting for the medicinal plant trade. The different species in this genus are difficult to identify accurately, particularly for laymen and also without flowering material, and the users and market traders do not accurately distinguish between the species, hence they are all at risk of over-exploitation. The species most commonly found in the markets are Crinum bulbispermum, C. stuhlmannii, C. macowanii and C. moorei; the latter species being the most vulnerable due to its smaller distribution and possibly the most distinctive because of the neck that forms a false stem (Verdoorn, 1973).

2.3.4. Preliminary Macro-Habitat Types

A brief evaluation of aerial imagery revealed the presence of the following macro-habitat types within the project area and immediate surrounds (refer to Figure 8):

- Aquatic habitat type (Rietspruit Dam);
- Deteriorated Grassland;
- Floodplain & Drainage Channel Wetland Types;
- Imperata cylindrica grassland;
- Phragmites reed stands; and
- Transformed Habitat & Dam Infrastructure.

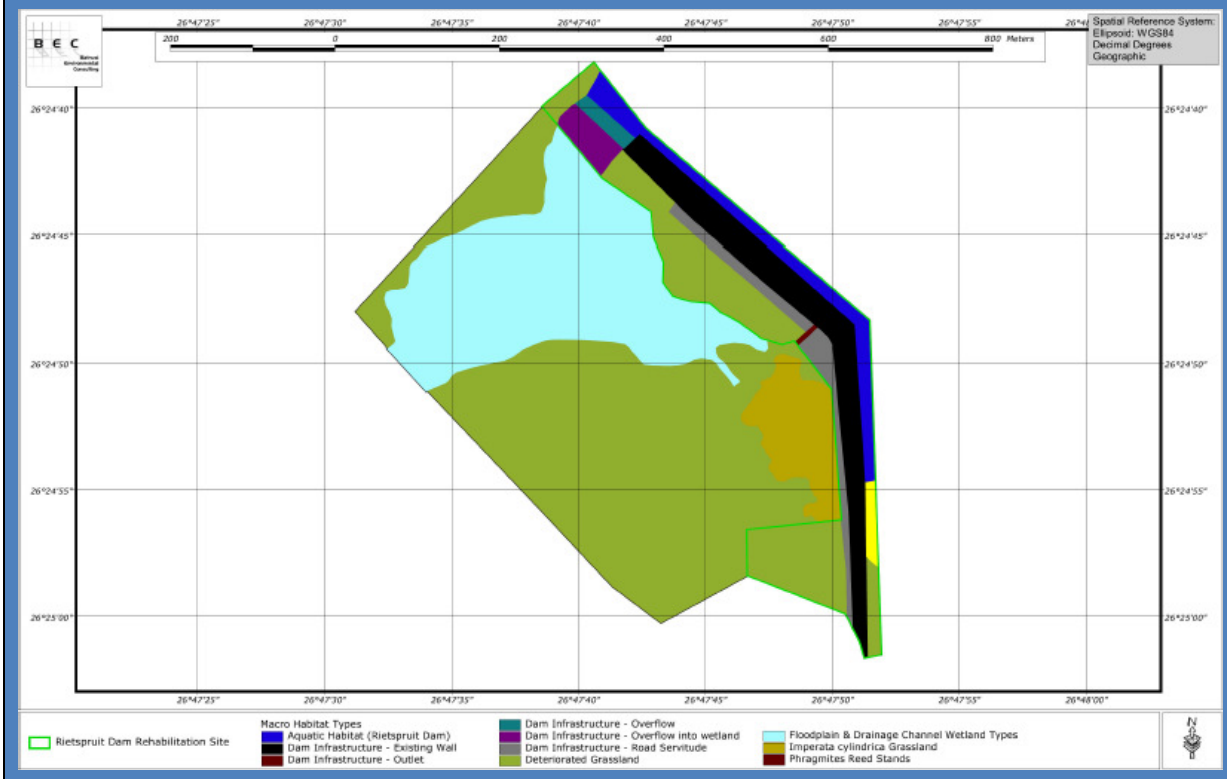


Figure 8: Macro-habitat Types of the Study Site and Immediate Surrounds.

2.3.5. Floristic Sensitivity

Sensitivity criteria employed in assessing the floristic sensitivity of separate units may vary between different areas comprising of a similar habitat type, depending on location, type of habitat, size, etc. General floristic sensitivity estimations are presented in Table 1. These estimations are used to ascribe a general floristic sensitivity value to units of the respective variations, illustrated in Figure 9. Additional aspects that are taken into consideration include surrounding habitat sensitivity, conservation potential, fragmentation and habitat isolation factors. Therefore, different units of a habitat variation might be ascribed a relatively wide range of floristic sensitivities.

Table 1: Floristic Sensitivity Estimations for Macro Habitat Types

Criteria	*RD species*	*Landscape sensitivity*	*Status*	*Species diversity*	*Functionality/ fragmentation*	*TOTAL*	*SENSITIVITY INDEX*	*SENSITIVITY CLASS*
Community					*Criteria Ranking*			
Aquatic habitat type (Rietspruit Dam)	10	8	2	2	8	210	66%	medium-high
Deteriorated Grassland	3	8	5	6	6	172	54%	medium
Floodplain & Drainage Channel Wetland Types	7	8	7	8	8	240	75%	medium-high
Imperata cylindrica grassland	10	10	8	6	10	288	90%	high
Phragmites reed stands	2	4	6	2	6	116	36%	medium-low
Transformed Habitat & Dam Infrastructure	1	2	2	2	2	54	17%	low

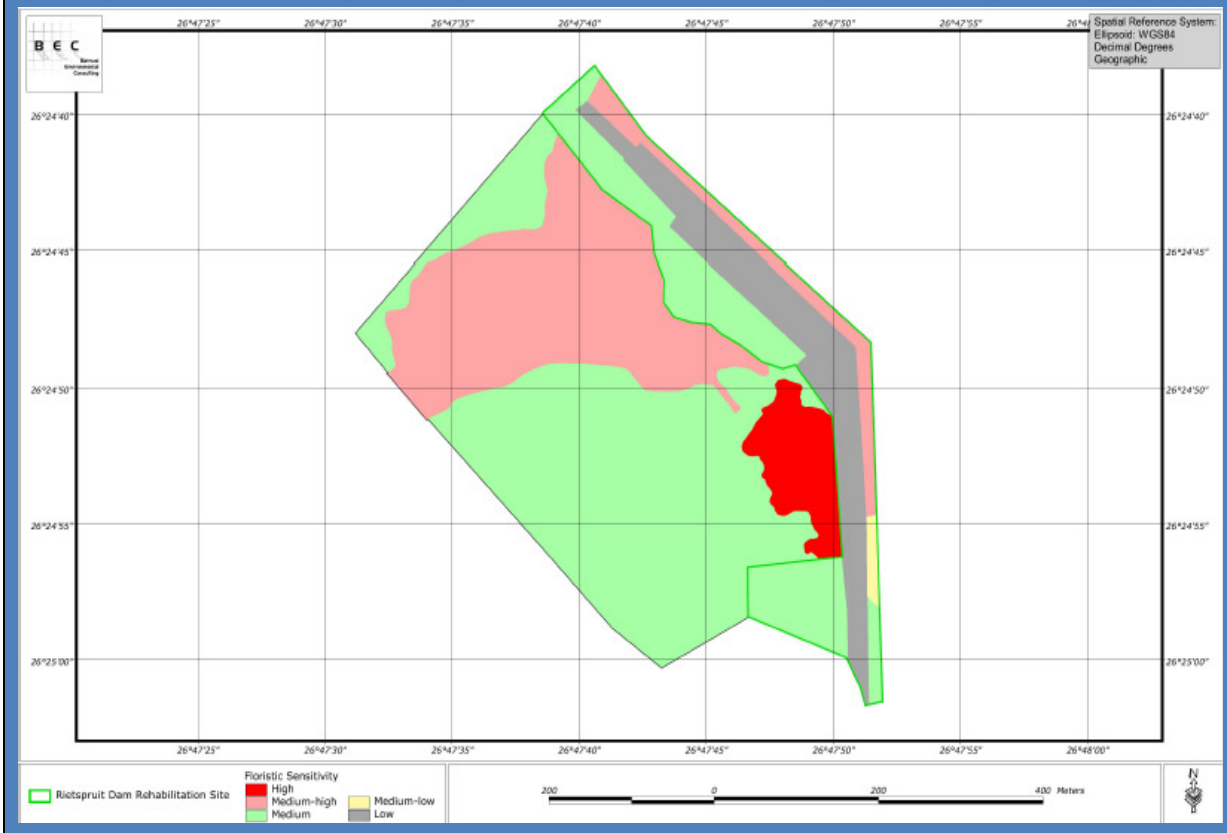


Figure 9: Floristic Sensitivity of the Receiving Environment

2.3.6. Regional Faunal Information

Only four (4) **invertebrate** species have been recorded for 2626BD. Taking cognisance of the known diversity of invertebrates, this indicates a severe paucity of invertebrate knowledge of the region. No red data invertebrates are known to persist within this Q-grid. Recorded individuals include Brown-veined White; African Monarch; Eyed Pansy; and African Grass Blue. A total of fourteen (14) **herpetofaunal** species have been recorded for 2626BD, none of which are currently considered threatened or listed as red data species and these include Three toads; Six frogs; Two snakes; One girdled lizard; One skink and One agama. One hundred and seventy-six (176) birds have been recorded in 2626BD, including birds from seventeen orders and fifty-eight families. Nine mammals have been recorded in

2626BD and these include One primate; Three rodents; One hare; One shrew; and Three carnivores.

2.3.7. Annotations on Red Data Fauna Taxa of the Region

- The African Grass-owl

The African Grass-owl (Tyto capensis) is a breeding resident in the study area with at least one breeding pair recorded during the brief site investigation. The Grass-owl has an extremely large distribution range in Africa (c. <20,000 km2) and the current global population is not experiencing declines at a rate for it to be included as a globally Vulnerable species. Therefore, the global status of the species remains "Least Concern". However, it is regionally (in South Africa) threatened (Vulnerable) due to rapid habitat loss which suggests that the regional population has declined by 10 % in the last three generations and is predicted to decline by a further 20 % in the next three generations (Barnes, 2000). Currently, the regional population size is less than 5,000 individuals (Barnes, 2000). Grass-owls are very susceptible to disturbances caused by livestock grazing and inappropriate burning regimes, which displace individuals from roosting and nesting sites. In addition, trampling by livestock and veld fires destroy nesting sites thereby altering the structure of their nesting and roosting habitat. Therefore, in terms of biodiversity monitoring and management, Grass-owls represent a good "umbrella" species for other fauna that also requires undisturbed wetland habitat, while typically avoiding degraded areas transformed by long-term and intensive grazing regimes and frequent fires.

2.3.8. Faunal Habitat Diversity

Faunal habitats of varying levels of sensitivity were recorded within the rehabilitation site and the immediate surrounds, namely (refer to Table 2 and Figures 10 and 11):

- Transformed Faunal Habitat;
- Degraded Faunal Habitat; and
- Natural Faunal Habitat.

Table 2: Faunal Habitat Estimations

Faunal Habitat Type		*ST*	*DV*	*LN*	*RD*	*SE*	*Ave (%)*	*Sens Class*
Transformed Habitat	Dam infrastructure – Existing Wall	2	2	1	1	2	16.0 %	low
	Dam infrastructure – Outlet	2	2	1	1	2	16.0 %	low
	Dam infrastructure – Overflow Area	2	2	1	1	2	16.0 %	low
	Dam infrastructure – Road servitude	2	2	2	1	2	18.0 %	low
Deteriorated Habitat	Aquatic habitat - Rietspruit Dam	4	3	4	1	3	30.0 %	medium-low
	Deteriorated Grassland	4	5	5	4	4	44.0 %	medium-low
	Phragmites Reed Stands	4	6	4	3	4	42.0 %	medium-low
Natural Habitat	Floodplain & Drainage Channel Wetland Type	7	8	8	7	8	76.0 %	high

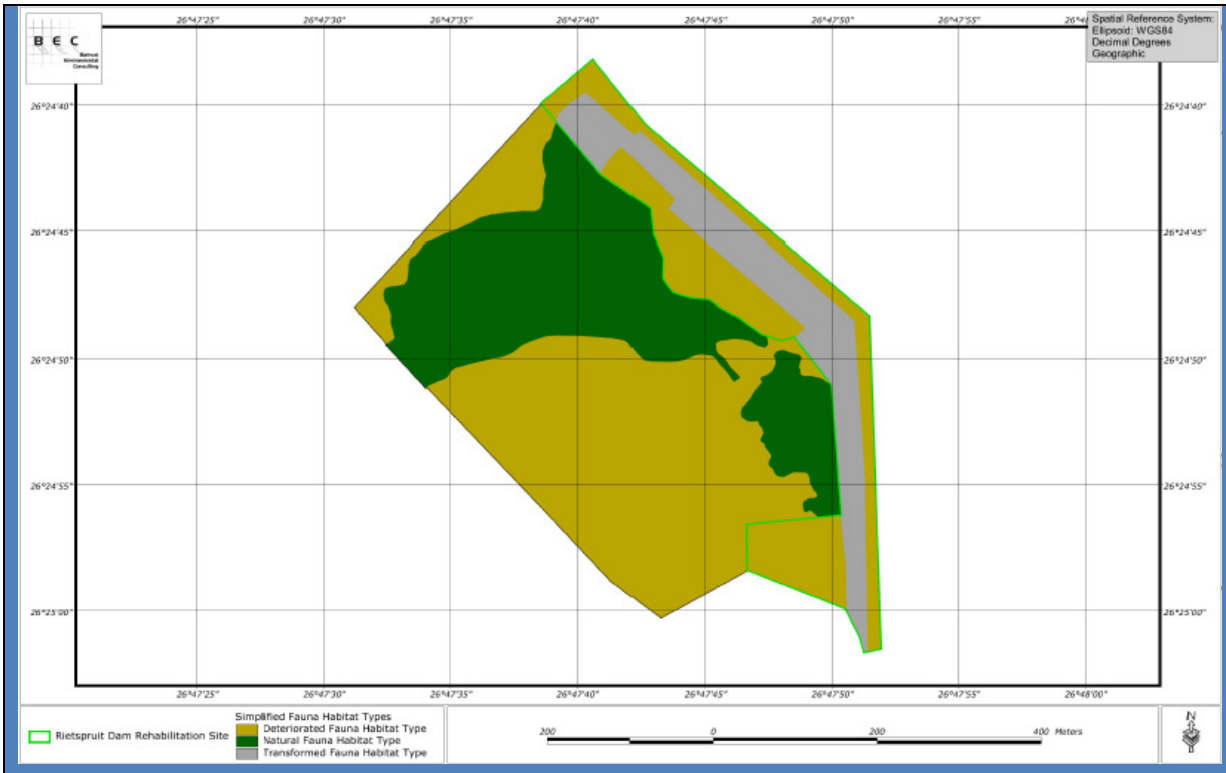


Figure 10: Faunal Habitat Types of the Study Site and Surrounds

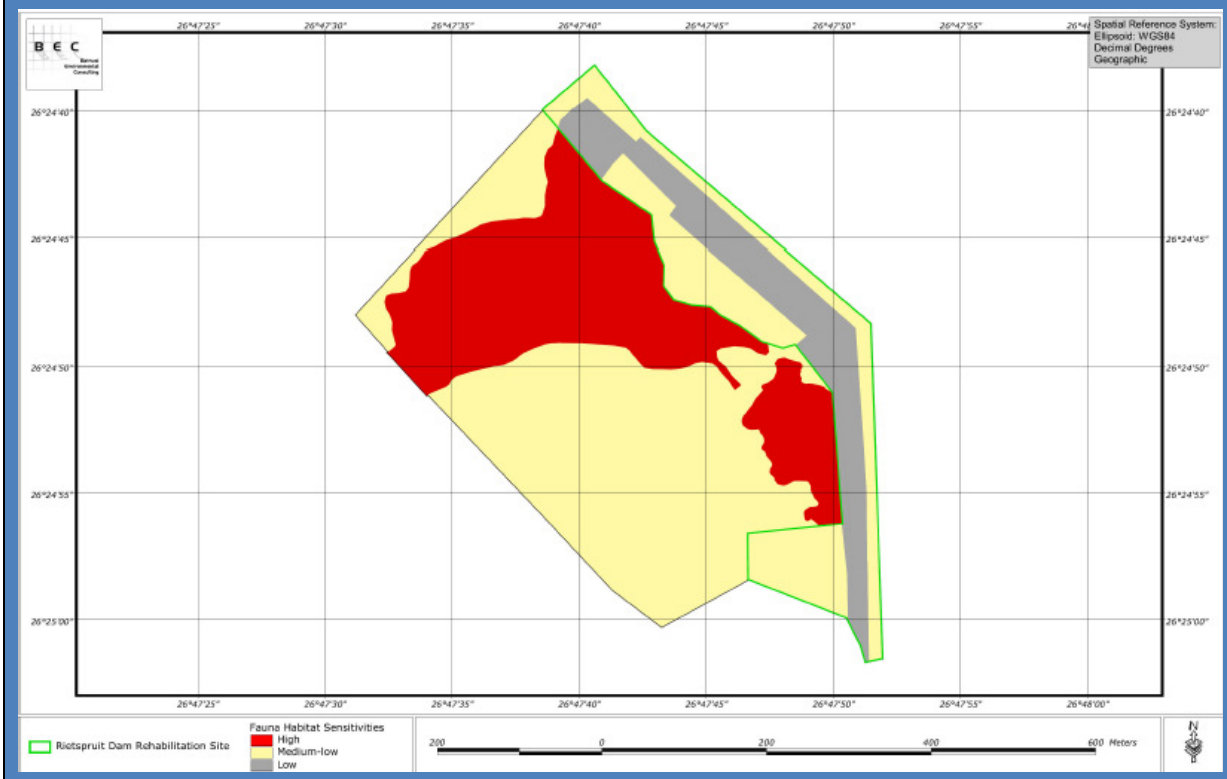


Figure 11: Faunal Sensitivity of Habitat Types

2.4. Heritage

2.4.1. Heritage Sites

- **Stone Age**

The cultural landscape of the region is a rural set-up and the human occupation is made up of a small scale pre-colonial element consisting of Stone Age and Late Iron Age occupation, as well as a Late Colonial component. The Late Colonial Age gave rise to the development of a number of smaller towns. There is limited information regarding the occupation of the Region during the Stone Age times. Records indicated that rock engravings occur far to the south and west of the region. This can be attributed to the region being inhospitable with a lack of suitable places to live (e.g. rock shelters) and the fact that the area is open with little open and accessible water.

- **Iron Age**

Iron Age people started to settle in Southern Africa around AD 300 with one of the oldest sites at Broederstroom, south of Hartebeespoort Dam, dating to AD 470. These people did not move outside the regular rainfall zone or occupy the central interior Highveld area due to the type of staple food (sorgum, millet) which they consumed that needed a summer rainfall. The occupation of the larger geographical area started in the 1500s due to the climatic conditions becoming warmer and wetter allowing farmers to occupy areas previously unsuitable (Witwatersrand and Magaliesberg). However, there are no sites known from this period in the larger region. The town of Ventersdorp was founded in 1866 on the farm Roodepoort and proclaimed a town in 1887. It is named after the former owner of the farm, Johannes Venter.

2.4.2. History of the Dam

Rietspruit Dam was constructed in 1940 and the dam wall was raised in in 1955; therefore it is older than 60 years and consequently is protected by the National Heritage Act No 25 of 1999. It is thus imperative that the dam and its associated infrastructure be documented in order for the South African Heritage Resources Agency to issue a permit for the proposed rehabilitation activities.

The sections below highlight different infrastructure associated with the dam that is older than 60 years.

2.4.3. Classification of the Dam

Rietspruit Dam is classified as an earth dam (also referred to as embankment dam). Earth dams are usually built in wide valleys having flat slopes as flanks and can be built on all types of foundations. A report compiled by Council for Geoscience states that there were site investigations conducted prior to the construction of the dam in 1940, but the “as built” founding conditions were not recorded. Thus, there is no information readily available regarding the site, its geology and the inner construction of the dam.

2.4.4. Dam Elements

- **Dam Wall**

The structure employed in or across a waterway for the purpose of impounding or diverting water. The crest of the dam is 920 meters in length and is a total of 13 meters high. The dam wall is illustrated in Figure 12.

- **Drain Valve of the Dam**

The valve installed on the outside of the dam is used to drain the dam and is installed towards the bottom of the dam in close proximity to the spillway. The valve has rusted from leaks and needs repair (refer to Figure 13).

- **Channel Outlet and Canal**

The Rietspruit Dam channel outlet and canal is made of concrete and extends over a number of kilometres in a southerly direction supplying water to different downstream farms (refer to Figure 14).

Figure 12: Rietspruit Dam Wall.

Figure 13: Rietspruit Dam Drain Valve.

Figure 14: Rietspruit Channel/Canal looking in a Westerly and Easterly Direction.

- **Flow Measuring Gauge**

Figure 15 depicts a measuring gauge that is used to measure the amount of water flowing out of the dam.

Figure 15: Rietspruit Flow Measuring Gauge.

- **Outlet Tower**

The outlet tower is used to regulate the outflow of the water from the dam and it was constructed at the old spillway points prior to the dam wall being raised in 1955. It is constructed from concrete and houses the radial gate system and outlet works isolation penstock. It is accessed by means of a steel truss bridge (refer to Figure 16).

Figure 16: Outlet Tower and Access Bridge to the Outlet Tower.

- **Radial Gate**

The radial gate allows for the control of volumes of water let out of the dam. The radial gate system comprises of the radial gate, lifting shaft and headstock mounted at the bottom and on top of the tower respectively. The radial gate system also includes the outlet works isolation penstock.

Figure 17: Radial Gate.

- **Spillway and Spillway Channel**

The spillway is 76 meters in length and the height could not be ascertained due to the height of the water level. A spill way channel conveys water from the spillway to the river downstream. In the case of the Rietspruit Dam, the left of the spillway channel is defined by means of a concrete wall. The channel has been scoured clean of surface soil due to previous floods.

Figure 18: Spillway and Spillway Channel.

- **Stair-case and Upstream Protection**

The Rietspruit Dam stair-case is used to access the crest of the dam at the outlet tower and is unique because it one of a kind in South Africa and is also built with hand dressed stones. The slope of the dam embankment is covered with different protective materials to protect it from deterioration and damage from wave action.

Figure 19: Stair-case and Upstream Protection.

- **Rock Toe-drain System Manholes**

Six manholes are connected by gravity pipes which tie into the canal. Their function is to drain any excessive leakages from the zoned embankment into receptor manholes.

Figure 20: Row of Manholes.

There were no significant heritage features and artefacts identified on site from a regional perspective. However, caution should be exercised during the construction activities and should there be any heritage features uncovered, these must be reported to the nearest museum and a heritage specialist should be contacted to conduct the investigations.

2.5. Wetlands and Surface Water in Proximity to Dam Wall

2.5.1. Soils

The predominant soil form encountered within the area of hydrophytic (wetland) vegetation downstream of the dam wall (see Figure 28 below on page 22) was the Westleigh Soil Form (Orthic A →Soft Plinthic B), with an Avalon Soil form (Orthic A→Yellow-brown Apedal B→Soft Plinthic B) encountered on the margins of the area of hydrophytic vegetation at one of the sample points. Both of these soil forms are classified as wetland soil forms. Soils sampled within the area of hydrophytic vegetation downstream of the spring, located to the north of the canal (i.e. located further downslope towards the Rietspruit valley bottom), also displayed soft plinthic characteristics, with the occurrence of Westleigh Soil Forms at the two sample locations investigated north of the canal. Certain of the soil samples in the area of hydrophytic vegetation to the south of the canal indicated that the soft plinthic B horizon was underlain by a hard plinthic B horizon, with the presence of an indurated plinthic layer at depth here appearing to correspond to the outcropping of the hard plinthic layer to the north (downslope) as discussed below. In the soil samples to the north of the canal in which a Westleigh Soil form was encountered, the soft plinthic layer morphed into non-diagnostic gleyed material (dark grey gleyed clays) that typically occurs with soft plinthic B horizons. The presence of these two soil forms (and predominance of soft plinthic B horizons) is confirmation that the area to the north and south of the canal is a wetland with the occurrence of hydromorphic soils that formed under natural conditions. Away from the area of hydrophytic vegetation, where the sward changed to a short grassland predominated by non-wetland grass species, the soft plinthic horizons were no longer present and a Clovelly Soil Form (a non-wetland soil form – Orthic A→Yellow-brown Apedal B→unspecified) was encountered. In the area to the north of the canal (surrounding the spring and associated wetland), shallow soils characterised by a shallow Orthic A horizon overlying hard plinthic material (a Dresden Soil Form), or alternatively areas of hard plinthic outcropping at the surface, were encountered (refer to Figure 21).

The soils were also sampled in a localised area of Typha capensis rushes in which groundwater discharge was occurring (refer to Figure 22) located to the north of (downslope of) the canal; these soils displayed different characteristics to the rest of the soil samples on the site. A Katspruit Soil Form (Orthic A→G) was encountered at the spring. This soil form is also a wetland soil form and is typically found in wetland areas typified by permanent saturation levels. The G horizon forms in conditions of extended or permanent saturation, resulting in the gleying of soils and the net accumulation of colloidal matter. The presence of the Katspruit Soil Form in the spring is very strongly

indicative that this is a naturally-occurring spring, which is caused by the discharge of groundwater, and being unrelated to any seepage from the dam.

Figure 21: Example of Soils from a Soft Plinthic B Horizon to the North of the Canal.

Figure 22: Soils from a G Horizon at the Spring Located to the North of the Canal.

2.5.2. Wetland Vegetation

The predominant species within the area of hydrophytic vegetation to the south of the canal is the grass species Imperata cylindrica. This species is a facultative hydrophyte (i.e. it occurs both within and outside of wetlands – Kotze and Marneweck, 1999); however, that designation is likely to apply more to the mesic eastern seaboard of South Africa which experiences high levels of mean annual precipitation. In the context of the drier western interior of South Africa in which the study site is located (the general area has a MAP of 580mm – Mucina and Rutherford, 2006), this species is more likely to be an obligate hydrophyte, only occurring within wetlands. This species forms dense, tall stands, with the area in which the hydrophytes are located to the south of the canal not appearing to be grazed by livestock. Other species encountered in this area were scattered Phragmites australis and Typha capensis, both of which are obligate wetland species. The margins of the area of hydrophytes (Imperata) was characterised by the presence of scattered Asparagus laricinus shrubs as well as some Gomphocarpus fruticosus shrubs. A transition to short grassland dominated by Themeda triandra and Cymbopogon excavatus was noted.

Figure 23: Tall, Dense Stand of Imperata Cylindrica to the South of the Canal.

To the north of the canal, other areas of hydrophytic vegetation were sampled. The area of active groundwater seepage (natural spring) was characterised by the presence of a dense stand of Typha capensis, an obligate wetland species. This species was also found along the artificial channel emanating from the canal and within the saturated area into which this channel and the natural spring feed. In the vicinity of the spring and downstream of the spring, other typical hydrophytes were encountered including the grass species Andropogon eucomis, sedge species such as Juncus exsertus, Schoenoplectus corymbosus and other hydrophytic herbs such as Ranunculus multifidus, Berula erecta and Marsilea macrocarpa. The predominance of these hydrophytes is a strong confirmatory factor of the presence of wetland habitat on the site. Although hydrophytes can colonise an area of artificial saturation, this vegetative assemblage along with the presence of hydric soils is confirmatory of the presence of natural wetland habitat.

Figure 24: The Wetland Downstream of the Spring Feeding Down into the Valley Bottom of the Rietspruit.

2.5.3. Hydrology and Terrain Setting Context

Hydrology is a key consideration of this assessment of wetland occurrence, as the possibility that the hydrophytes are fed by seepage from the dam wall has been raised as a reason to explain their presence. No active seepage was noted from any point on the dam wall adjacent to the area of investigation. In a terrain setting context, the area of hydrophyte occurrence is located on the footslopes to the south of the Rietspruit valley floor (bottom). It is important to note that wetlands and surface water features can be found all across a landscape, and are not limited to valley floors in which depositional wetland features typically occur. Wetlands can occur on other terrain units, including sloping ground, and wetlands occurring on these different terrain units typically differ in terms of their formative processes and hydrological inputs. Wetlands occurring in sloping terrain settings are characterised by colluvial processes and the input of sub-surface water inputs.

The classification of wetland forms has been based upon the most updated wetland classification system for South Africa – the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis et al, 2013). The system uses a six-tiered approach for classifying inland aquatic systems, including wetlands. Levels 4 and 5 (hydrogeomorphic (HGM) unit and hydrological regime respectively) are the focal points of the classification system – i.e. these describe the functional unit (Ollis et al, 2013).

According to the classification system, the wetland on the site qualifies as a seep wetland. Seeps are often associated with lithologies that cause groundwater to discharge to the surface, or are located in topographic positions that either cause groundwater to discharge to the land surface or rain-derived water to 'seep' down-slope as subsurface interflow (Ollis *et al,* 2013). The dominant presence of soft plinthic strata in the wetland is strongly indicative of the presence of a naturally-occurring shallow groundwater table. The groundwater may be a perched aquifer or hydrologically connected to deeper groundwater. The presence of a G Horizon within the spring located to the north of the canal is also strongly suggestive of the presence of groundwater seepage at this point. The spring is surrounded by hard plinthic material (ferricrete) and the general predominance of plinthic material in the soils (ranging from younger soft plinthic material to hard plinthic material in a more advanced state of induration) suggests that over the wider area on the southern footslopes of this reach of the Rietspruit immediately downstream of the dam, the primary hydrological driver is the presence of naturally-occurring shallow groundwater, which discharges to the surface at the spring (refer to Figure 25).

It is important to note that certain of the hydrological inputs to the wetland area to the north of the canal are artificial. As mentioned above, an artificial channel is located to the west of the spring. Analysis on the site revealed that this channel which is lined with *Typha capensis* rushes is directly linked to a sluice gate in the canal. Although the sluice gate was closed, small volumes of water were visibly draining from the canal into the channel. This artificial source of water is feeding the downstream wetland and from the site analysis has effectively widened the area of wetland that would naturally be present due to outflow from the spring to the east, as the artificial channel feeds into that wetland.

Figure 25: The Natural Spring Located to the North of the Canal.

It is possible that seepage from the dam could be feeding into sub-surface flow paths that are feeding the spring; however, it is important to note that the overall soft plinthic characteristics of the wider area suggest that naturally occurring shallow water tables are present.

Under the Ollis *et al* (2013) categorisation, the sub-categorisation of seeps relates to the nature of the outflow, with seeps either having channelled or without channelled outflow. It is hypothesised that *both sub-categories of seep wetlands naturally* occur on the site. The upper part of the seep wetland (i.e. the portion to the south of the canal) is likely to have naturally had no channelled outflow. The sub-

surface hydrological inputs in this upper part of the wetland appear to be naturally related to the presence of a rising and falling groundwater table (possibly due to a perched aquifer), with no natural outflow or discharge of water present (in spite of the transformative presence of the canal). The presence of the natural spring and associated downstream wetland which feeds into the valley bottom wetland/stream falls into the second sub-category of seep. Although no distinct channel exists, this lower part of the seep wetland is hydrologically connected to the wider drainage network via the wetland that feeds into the Rietspruit downstream of the dam wall.

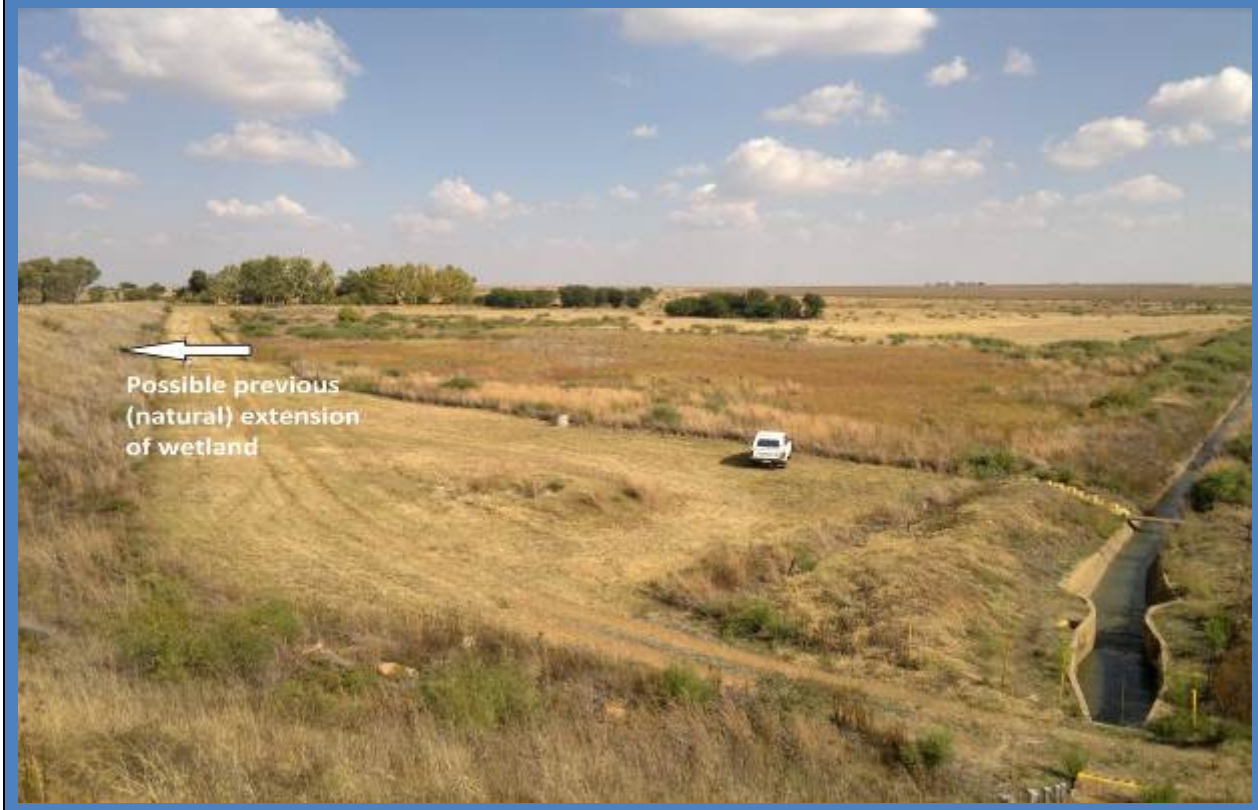


Figure 26: The Seep Wetland with no Channelled Outflow to the South of the Canal.

Figure 27: The Seep Wetland with Channelled Outflow to the North of the Canal.

2.5.4. Wetland Boundaries

The boundaries on the eastern side of the wetland stop at the edge of the access track located immediately adjacent to the toe end of the dam wall. This access track, although grassed, consists of fill material (imported crushed rock). It is thus highly likely that part of the eastern part of the wetland has been transformed by the presence of the track as well as by the dam wall.

Figure 28: Location of Wetlands Downstream of the Rietspruit Dam Wall.

2.5.5. Assessment of Wetland State

The following scores have been allocated to the wetland unit using the Wet-Health Tool:

Table 3: Wetland State

PES Geomorphology	PES Hydrology	PES Vegetation
A	C	C

The highest score allocated is for geomorphology, reflecting a natural or unaltered state. This reflects the highly stable nature of soils in the wetland, with no erosion noted. Due to the combination of the sloping terrain setting and the presence of water at the surface, erosion can adversely affect hillslope seepage wetlands, and can negatively impact the geomorphological state of the wetland. The high degree of plant cover (in spite of livestock grazing in the lower part of the reach) assists in the protection of soils in the wetland. Scores reflecting a moderately modified state have been assigned to the hydrology and vegetative state of the wetland. The presence of the Rietspruit Dam, and associated dam wall and access track at the foot of the wall that is believed to have transformed the uppermost parts of the seep wetland, is responsible for the partial loss (transformation) of wetland habitat, thus degrading vegetative state. The presence of the dam

has altered the natural hydrology of the wetland in two ways; firstly, the dam has transformed a large part of the catchment of the wetland, thus altering catchment run-off from a natural state by reducing flows. This is counteracted however by possible increased seepage from the dam wall into the wetland, and by 'leakage' from the canal that leads from the dam and which bisects the wetland. A sluice gate in the canal that, although closed, leaks water towards the downstream part of the wetland unit, is creating a narrow artificial flow path which has been colonised by Typha capensis rushes. The presence of these reeds suggests that the inflow from the canal leakage occurs on a permanent basis, and is likely to have resulted in a net input of water into the lower part of the wetland unit. Overall, the wetland is likely to be in a moderately modified state, still displaying areas of intact wetland habitat which are important from an ecological perspective.

2.5.6. Assessment of Wetland Functionality

Figure 29 below indicates the outcomes of the wetland functionality assessment.

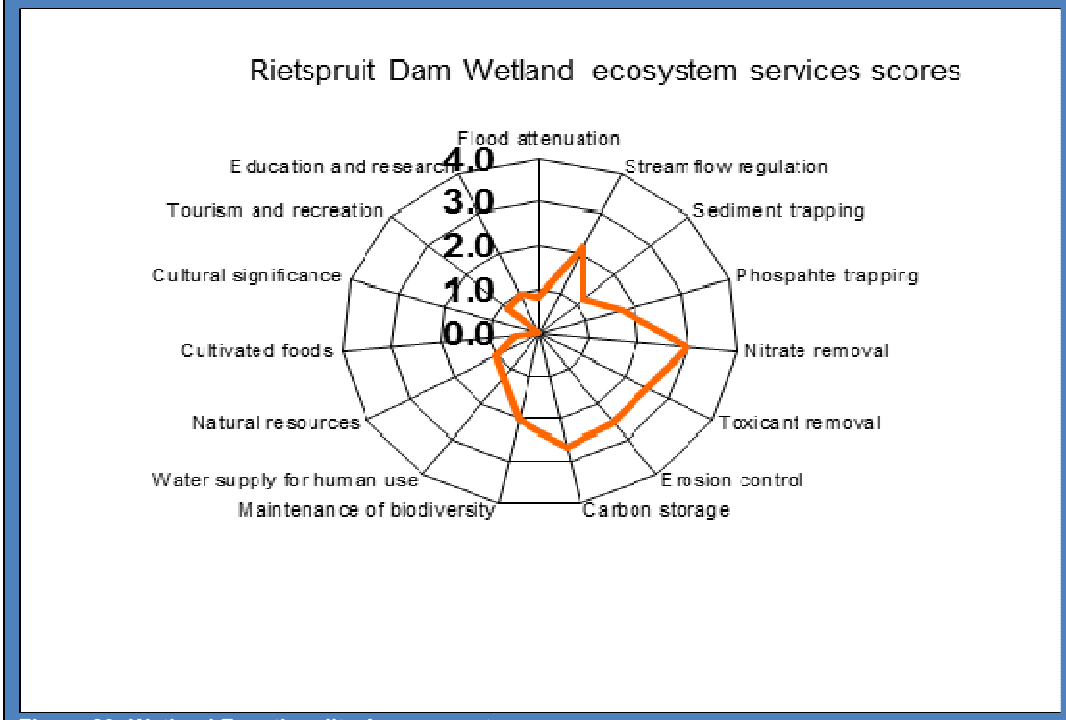


Figure 29: Wetland Functionality Assessment.

No ecosystem services were assessed as being performed to a high degree. The following ecosystem services were, however, assessed as being performed to a moderate degree:

- Nitrate removal;
- Toxicant removal; I
- Erosion control; and
- Carbon storage.

Nitrate and toxicant removal are typically ecosystem services performed to a high degree by hillslope seepage wetlands. Nitrogen and specifically nitrate removal occurs as the groundwater emerges through low redox potential zones within the wetland soils, with the wetland plants contributing to the necessary supply of organic carbon (Kotze et al, 2009). Hillslope seepage wetlands can similarly act to remove toxicants. The small size of the wetland and hydrological connectivity (to the wider drainage system) of only a part of the wetland are likely to limit this aspect of the wetland's functionality, however. Erosion control and carbon storage functions are a direct product of the high degree of vegetation cover in the wetland. There was no erosion noted in the wetland, in spite of a relatively high livestock grazing presence within the wetland, that is often associated with the exposure and disturbance of soils and vegetation through trampling. The relatively low levels of disturbance in the wetland and moribund plant cover in many parts of the wetland unit contribute to its carbon storage function.

2.5.7. Assessment of Ecological Importance and Sensitivity

An ecological importance and sensitivity score of 3.3 (out of 4) has been assigned to the wetland immediately adjacent to the southern portion of the Rietspruit Dam wall. This reflects a score of high ecological importance and sensitivity. Although all wetlands are ecologically important, and in spite of the small size of the wetland, the wetland displays a high ecological importance and sensitivity rating due primarily to the confirmed presence of a threatened bird species in the wetland – the African Grass-owl (Tyto capensis), which is nationally red-listed as being vulnerable. The wetland habitat within the upper part of the wetland unit (the hydrologically isolated seep compartment) provides suitable breeding and roosting habitat for this species. The species prefers rank grass and marshes and the tall moribund grass of the wetland provides excellent habitat.

In addition, another owl species, the Marsh Owl (Asio capensis), which, although not threatened, is vulnerable to continued degradation of its preferred wetland habitat, was located in the wetland. Both species were confirmed from the site visit and the wetland area to the south of the canal is thus used as a roost site and possibly even as a breeding site.

The Biodiversity Support Aspect of Ecological Importance and Sensitivity of any wetland is based on a number of factors including the presence of threatened species, the presence of populations of unique species and the presence of migration/breeding/ feeding sites (Rountree et al, 2013). This seep wetland scores very highly under two of these categories (the presence of a nationally threatened bird species and providing habitat for feeding, roosting and possibly breeding of this species). This wetland is thus highly sensitive and ecologically important from a biodiversity protection viewpoint in spite of its small size. The activities associated with the rehabilitation of the dam must accordingly create as little physical impact and disturbance to this wetland as possible and it is strongly recommended that the footprint of any construction works not extend into the current boundary of the wetland.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN R. 983, GN R. 984 and GN R.985	Description of project activity that may trigger the listed activity
GNR 983: Activity 19 The infilling or depositing of any material of more than 5 cubic meters into or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic meters from- (i) A watercourse	The construction activities will entail the infilling and deposition of approximately 10 000 cubic meters of borrow material to stabilise the downstream face of the dam embankment. Approximately 100 m^3 of silt is to be dredged from the reservoir in order to open the river outlet valve's inlet.
GNR 983: Activity 27 The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	The construction activities will take place in an area that is approximately 5 hectares in size and will entail the removal of approximately 1 hectare of indigenous vegetation.
GNR 983: Activity 48 The expansion of- (iv) Dams where the dam, including infrastructure and water surface area is expanded by 100 square meters or more in size. Where such expansion and related	The construction activities will entail widening the cross-section footprint of the dam by 3.5 to 7m along the length of the dam wall. The dam is situated within the proximity of a watercourse. The total increase in the footprint of the dam will be approximately 4000 m^2. There is a valley bottom wetland located within 10m of the proposed construction area.

Listed activity as described in GN R. 983, GN R. 984 and GN R.985	Description of project activity that may trigger the listed activity
operations occurs within a (a) watercourse (c) If no development setback exists within 32 meters of a watercourse measured from the edge of a watercourse.	
GNR 985: Activity 23 The expansion of a: (iv) dam where the dam is expanded by 10 square meters or more in size (f) outside an urban area in (aa) A protected area identified in terms of NEMPAA; (dd) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and adopted by a competent authority.	The construction activities will entail widening the cross section footprint of the dam by 3.5 to 7m along the length of the dam wall. The dam is situated in a watercourse. The total increase in the footprint of the dam will be approximately 4000 m^2. The study area is also located within an area classified as vulnerable by the North West Province Biodiversity Conservation Technical Report, 2009.

2. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) **the design or layout of the activity;**
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should

be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3

In the case of linear activities:

Alternative:	**Latitude (S):**	**Longitude (E):**
Alternative S1 (preferred) • Starting point of the activity • Middle/Additional point of the activity • End point of the activity		
Alternative S2 (if any) • Starting point of the activity • Middle/Additional point of the activity • End point of the activity		
Alternative S3 (if any) • Starting point of the activity • Middle/Additional point of the activity • End point of the activity		

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

b Lay-out alternatives

c) Technology alternatives

[redacted]

d) Other alternatives (Design alternatives)

Since Rietspruit Dam is an existing dam, design alternatives were investigated in respect of the rehabilitation activities.

Alternative 1 (preferred alternative) Loading the Toe.

Loading the toe is an effective solution which will improve the stability of the dam. This is done by constructing a berm along the toe of the embankment. This solution can be implemented at a relatively low cost. This is because (a) it has a smaller cross-section shape; b) it only needs to be constructed at the deeper sections.

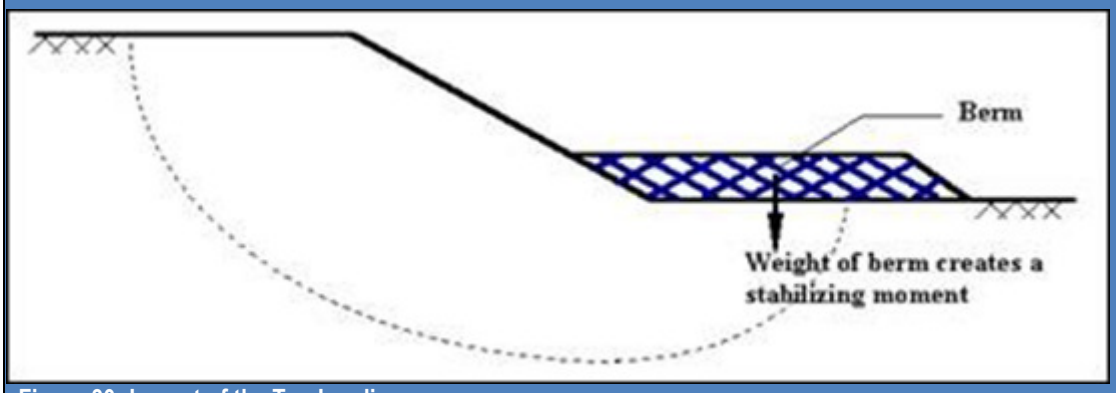


Figure 30: Layout of the Toe Loading.

Alternative 2 : Regrading the Slope

Re-grading the slope is expensive because it has a (a) bigger cross-section shape; (b) it is constructed across the whole length of the embankment.

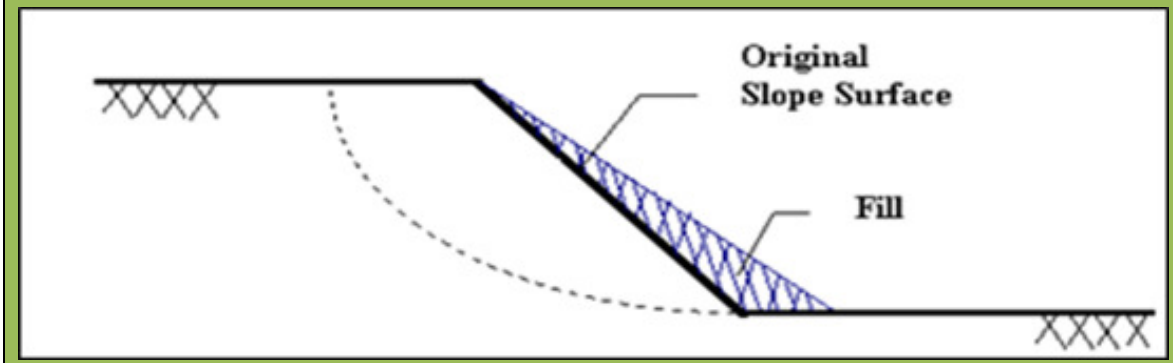


Figure 31: Layout of the Toe Regarding the Slope.

e) No-go alternative

If the proposed activity is not implemented as planned, this would constitute accepting an annual probability of dam failure of between 1:100 and 1:1000 years resulting in higher safety risks. Thus, this alternative is not preferred or acceptable.

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1[1] (preferred activity alternative)	4000m²
Alternative A2 (if any)	4000m²
Alternative A3 (if any)	

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	5000m²
Alternative A2 (if any)	5000m²
Alternative A3 (if any)	

4. SITE ACCESS

Does ready access to the site exist?	YES	NO
If NO, what is the distance over which a new access road will be built		

Describe the type of access road planned:

N/A

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

[1] "Alternative A.." refer to activity, process, technology or other alternatives.

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	YES
The rehabilitation activities will take place within the existing dam servitude and property boundaries in order to improve the operational status of the dam. The dam has been in existence for more than 75 years.	
2. Will the activity be in line with the following?	
(a) Provincial Spatial Development Framework (PSDF)	YES
(b) Urban edge / Edge of Built environment for the area	YES
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES
The Ventersdorp Local Municipality Integrated Development Plan and Spatial Development Framework describe the Rietspruit Dam as an Eco Tourism Node. It also serves an important function by providing irrigation water to downstream farmers.	
(d) Approved Structure Plan of the Municipality	YES
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES
(f) Any other Plans (e.g. Guide Plan)	
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES
The Rietspruit Dam forms part of the Ventersdorp Local Municipality IDP and SDF. It is also part of a Department of Water and Sanitation government waterworks.	

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	
The Rietspruit Dam has multiple uses and these include: (a) water supply for local famers; (b) recreational activities by local communities; (c) as well as providing a tourist attraction.		
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	
7. Is this project part of a national programme to address an issue of national concern or importance?	YES	
The proposed project is aimed at making the dam safe in terms of the Dam Safety Regulations under Chapter 12 of the 1998 National Water Act. Therefore, it is imperative that the dam be kept safe to allow continuity of the water supply and amenities it provides to local famers, local communities and tourists.		
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	
The rehabilitation activities will be conducted within the boundaries of the dam site, which has been in existence for more than 75 years. Thus, the land use will not change.		
9. Is the development the best practicable environmental option for this land/site?	YES	
The proposed project is aimed at making the dam safe in terms of the Dam Safety Regulations under Chapter 12 of the 1998 National Water Act.		
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	
Yes. The proposed development will ensure continuation of the many social benefits to the downstream farmers, recreational users of the dam, the local communities and the economy of the local authority.		
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	
No. The proposed rehabilitation activities are essential to ensure the safety and continued functioning of the dam.		

12. Will any person's rights be negatively affected by the proposed activity/ies?	NO
The project will benefit the local famers, communities and tourists in general through the continued use and enjoyment of a safe amenity (dam).	
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	NO
The proposed project is located outside the urban edge of the Ventersdorp Local Municipality.	
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES
The proposed project can be categorised by Strategic Integrated Projects as, Infrastructure – water (bulk and reticulation). The rehabilitation activities will ensure the continued use of a valuable piece of infrastructure.	
15. What will the benefits be to society in general and to the local communities?	
The society and the local community will continue to use and enjoy amenities provided by a safe dam, which is an important contributor towards the local ecomomy.	
16. Any other need and desirability considerations related to the proposed activity?	NO
17. How does the project fit into the National Development Plan for 2030?	
The objective of the National Development Plan for 2030 is for all South Africans to have social equity through expanded access to safe amenities. Thus, the proposed project is aimed at fulfilling this objective by providing an important water resource to local farmers and a safe recreational facility (dam) to the community and tourist visitors to Venterdorp.	
18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	
The proposed project has been undertaken according to Section 24 of the National Environmental Management Act (NEMA) (No 107 of 1998) and the following aspects of Section 23 have been considered: ▪ It was identified that the proposed activity will result in some detrimental environmental impacts during construction. Thus an Application for the Environmental Authorisation is being lodged with the Department of Environmental Affairs in November 2015 as the competent authority, due the applicant (Department of Water and Sanitation) being an Organ of State; ▪ An Environmental Basic Assessment Process is prescribed for the proposed project instead of a Full EIA (Scoping and EIA) process due to the nature of the proposed project being classified as less significant or detrimental to the environment when compared to other developments/projects that present significant detrimental impacts - thus requiring a Full EIA process to undertaken prior implementation of the project; ▪ Potential environmental impacts (including biodiversity, surface water and heritage) and risks associated with the construction phase of the project have been identified and assessed according to their significance. Mitigation measures have been recommended for the more significant impacts; ▪ A Public Participation Process is being conducted for the project, where local farmers, landowners, communities and the local authority (Interested and Affected Parties) are being consulted from the ootset and throughout the Environmental Basic Assessment process in order to receive their views about the proposed development; ▪ The Environmental Basic Assessment report together with the Environmental Management Programme will be submitted to the Department of Environmental Affairs for review and approval prior the implementation of the project; and ▪ The principles of NEMA such as the "polluter pays principle" have also been considered within the Environmental Management Programme for the project, where the Department of Water and Sanitation and its appointed Contractors will be responsible for avoiding negative impacts and where not possible, mitigating or rectifying any damages caused to the environment.	

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

All efforts are being made to ensure that the project achieves sustainability, environmental justice and that the environmental rights of Interested and Affected Parties (local stakeholders, communities and the construction employees) are protected. This will be achieved by the Department of Water and Sanitation and its' Contractors through the implementation of the recommendations provided by the Basic Assessment specialist studies, the project's environmental management programme and Environmental Authorisation, once issued by the Department of Environmental Affairs.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
The Constitution of South Africa (Act No 108 of 1996)	Protection of human rights and environment of the study area.	National & Provincial	1996
National Environmental Management Act (Act No 107 0f 1998)(as amended)	Protection of the environment of the study area and surroundings.	National & Provincial	1998
National Environmental Management: Waste Act (Act 59 of 2008) (as amended)	Protection of the surrounding environment through efficient waste management by the appointed Contractor.	National & Provincial	2008
National Environmental Management : Air Quality Act (Act No 39 of 2004)	Protection of air quality of the study through dust minimisation and the application of dust suppression measures.	National & Provincial	2004
National Heritage Resources Act (No 25 of 1999)	Protection of heritage resources surrounding the study area and those uncovered during the development phase by reporting to the nearest heritage authority.	National & Provincial	1999
National Environmental Management: Biodiversity Act (10 of 2004)	Protection of biodiversity features and where not possible relevant permits will need to sort by the Contractor.	National & Provincial	2004
National Water Act (Act No 36 of 1998)	Protection of water resources and where not possible relevant permits/licences will need to sort by the Contractor.	National & Provincial	1998
National Road Traffic Act (No 93 of 1996)	The Contractor will obey traffic laws by driving at minimal speed approved by local authorities.	National & Provincial	1996
Occupational Health and Safety Act (No 85 of 1993)	Protection of workers on site through provision of Personal Protective Equipment's; Training and other health and safety amenities.	National & Provincial	1993
All relevant Provincial regulations and Municipal bylaws	The Contractor will obey and abide by provincial and municipal bylaws which are related to the proposed project.	Provincial and Local	

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase? YES

If YES, what estimated quantity will be produced per month?

It is not known at this stage.

How will the construction solid waste be disposed of (describe)?

Waste generated during the construction activities will be collected by the trucks of the appointed Contractor and disposed of at the registered Ventersdorp landfill facility.

Where will the construction solid waste be disposed of (describe)?

Waste generated will be disposed off at the Ventersdorp landfill facility.

Will the activity produce solid waste during its operational phase? YES

If YES, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

Not directly. Solid waste will be generated by people visiting the dam for recreational purposes. There are waste bins located at the dam for the disposal of waste by visitors. Waste generated by visitors will be disposed of at the Ventersdorp landfill facility.

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Ventersdorp landfill facility.

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

N/A

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? NO

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM: WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? NO

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? NO

If YES, what estimated quantity will be produced per month?

Will the activity produce any effluent that will be treated and/or disposed of on site? NO

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? NO

If YES, provide the particulars of the facility:

Facility name:	Not Applicable.
Contact person:	
Postal address:	
Postal code:	
Telephone:	**Cell:**
E-mail:	**Fax:**

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Not Applicable.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities? NO

If YES, is it controlled by any legislation of any sphere of government? NO

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

During the construction phase, dust and vehicular emissions will be released as a result of earth moving machinery and trucks transporting construction material. Any emissions will, however, have short term impacts on the immediate surrounding areas which can be easily mitigated and thus the authorisation of such emissions will not be required.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA? NO

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise? YES

If YES, is it controlled by any legislation of any sphere of government? NO

Describe the noise in terms of type and level:

The movements of construction trucks, machinery and other construction activities will generate noise on site and affect nearby residents. However, the noise will be of a short term, temporary, localised nature and will last only during the construction phase of the project. The EMPr specifies that the appointed Contractor should liaise with affected communities during construction to minimise noise impacts. The noise level is anticipated to be less than 50dBA to the nearest sensitive receivers as required by SANS 10103 and thus, authorisation will not be required for the noise impacts. Occupational health and safety standards will apply.

13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box (es):

Municipal	

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

	NO

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

The proposed project is located within the boundaries of a watercourse (dam and wetland) thus normally requiring a Water Use Licence (WUL). However, a WUL will not be required for the project due to the Department of Water and Sanitation (DWS) being the custodian of the Rietspruit Dam which is a government waterworks. It is also mandated by law (National Water Act (No 36 of 1998)) to identify and minimise health and safety risks for all water resources under its control. The proposed rehabilitation of the Rietspruit Dam is aimed at fulfilling this mandate by making the dam safe for continued use into the future. The environmental impact implications of not doing so would be severe in the event of a dam failure. The DWS has obtained legal opinion supporting their exemption from obtaining a WUL. A letter confirming this opinion is attached in Appendix G.

14. ENERGY EFFICIENCY

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

Not Applicable

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Not Applicable

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A): 2

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? YES

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	North West Province
District Municipality	Dr Kenneth Kaunda District Municipality
Local Municipality	Ventersdorp Local Municipality
Ward Number(s)	Not Applicable
Farm name and number	Flakfontein 213 and 214 IP
Portion number	9, 28, 32, 35, 43, 44, 76, 20, 116, 119, 120, 121, 144, 146, 147, 149
SG Code	See below.

T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	9
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	2	8
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	3	2
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	3	5
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	4	3
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	4	4
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	0	7	6
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	0	2	0
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	1	6
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	1	9
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	2	0
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	2	1
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	4	4
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	4	6
T	O	I	P	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	4	9

Current land-use zoning as per local municipality IDP/records:

Agricultural and Rural.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required? NO

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

1:20 – 1:15

Alternative S2:

1:20 – 1:15

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

Alternative 1

2.1 Ridgeline		2.4 Closed valley		2.7 Undulating plain / low hills	X
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain		2.9 Seafront	
2.10 At sea					

Alternative 2

2.1 Ridgeline		2.4 Closed valley		2.7 Undulating plain / low hills	X
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain		2.9 Seafront	
2.10 At sea					

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1:	Alternative S2:
Shallow water table (less than 1.5m deep)	YES	YES
Dolomite, sinkhole or doline areas	NO	NO
Seasonally wet soils (often close to water bodies)	YES	YES
Unstable rocky slopes or steep slopes with loose soil	NO	NO
Dispersive soils (soils that dissolve in water)	NO	NO
Soils with high clay content (clay fraction more than 40%)	NO	NO
Any other unstable soil or geological feature	NO	NO
An area sensitive to erosion	NO	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative 1

Natural veld - good condition[E]	Natural veld with scattered aliens[E]

Alternative 2

Natural veld - good condition[E]	Natural veld with scattered aliens[E]

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Alternative 1

According to the Biodiversity Study conducted by Bathusi Environmental for the project, the major anthropogenic transformation activity in the immediate region of the study site is commercial agriculture. Remaining areas within the surrounds comprises of grasslands where intensive grazing cattle grazing is practiced. There are populations of a declining floral specie (geophyte Crinum bulbispermum) found in the study area, more specifically the dam wall/shore areas, that are declining due to the harvesting of medicinal plants. Locally threatened (Vulnerable) Grass-owls are also present in nearby wetlands.

Alternative 2

According to the Biodiversity Study conducted by Bathusi Environmental for the project, the major anthropogenic transformation activity in the immediate region of the study site is commercial agriculture. Remaining areas within the surrounds comprises of grasslands where intensive grazing cattle grazing is practiced. There are populations of a declining floral specie (the geophyte Crinum bulbispermum) found in the study area, more specifically the dam wall/shore areas, that are declining due to the harvesting of medicinal plants. Locally threatened (Vulnerable) Grass-owls are also present in nearby wetlands.

5. SURFACE WATER

Alternative 1

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES	
Non-Perennial River		NO
Permanent Wetland	YES	
Seasonal Wetland		NO
Artificial Wetland	YES	
Estuarine / Lagoonal wetland		NO

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

According the Wetlands/Surface Water Study conducted by RHDHV; the Rietspruit and Rietspruit Dam is a tributary of the Schoonspruit and Vaal River. There are seep wetlands in close proximity of the dam wall, as well as artificial wetlands. Artificial wetlands are caused by seepage from the dam that is feeding into sub-surface flow paths that are feeding the spring located close to the dam.

Alternative 2

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES		
Non-Perennial River		NO	
Permanent Wetland	YES		
Seasonal Wetland		NO	
Artificial Wetland	YES		
Estuarine / Lagoonal wetland		NO	

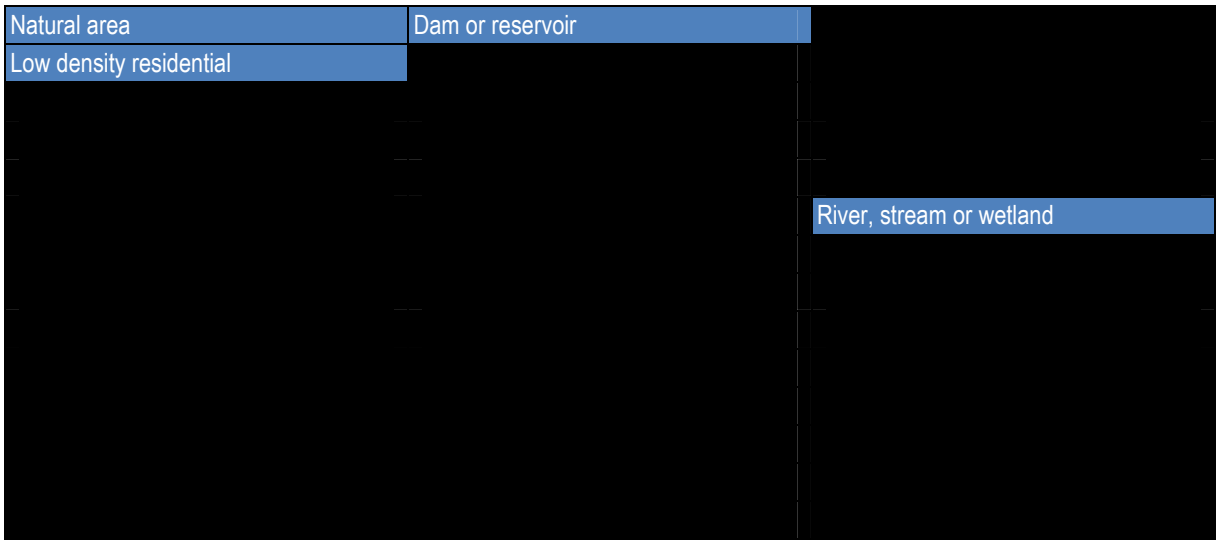
If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

According the Wetlands/Surface Water Study conducted by RHDHV; the Rietspruit and Rietspruit Dam is a tributary of the Schoonspruit and Vaal River. There are seep wetlands in close proximity of the dam as well as artificial wetlands. Artificial wetlands are caused by seepage from the dam that is feeding into sub-surface flow paths that are feeding the spring located close to the dam.

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Alternative 1



If any of the boxes marked with an "N "are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not Applicable

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not Applicable

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not Applicable

Does the proposed site (including any alternative sites) fall within any of the following :

Critical Biodiversity Area (as per provincial conservation plan)	YES	NO
Core area of a protected area?	YES	NO
Buffer area of a protected area?	YES	NO
Planned expansion area of an existing protected area?	YES	NO
Existing offset area associated with a previous Environmental Authorisation?	YES	NO
Buffer area of the SKA?	YES	NO

The North West Province Biodiversity Conservation Area (NWPCBA) Plan indicates that the proposed project site is situated within a CBA Category 2 area, comprising of the conservation important Vaal-Vet Sandy Grassland (Endangered). Category 2 areas include parts of 'Near-natural landscapes' where (refer to Figure 32) :

- Ecosystems and species are largely intact and undisturbed;
- Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for the loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets; and
- These are landscapes that are approaching but have not passed their limits of acceptable change.

Ideally, these parts of the landscape need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural, or near-natural state, then biodiversity conservation targets cannot be met. For CBAs, the impact on biodiversity of a change in land-use that results in a change from the desired ecological state is most significant locally at the point of impact through the direct loss of a biodiversity feature (e.g. loss of a populations or habitat). Fortunately, due to the small size of the proposed project, it is unlikely that natural habitat will be lost or adversely affected.

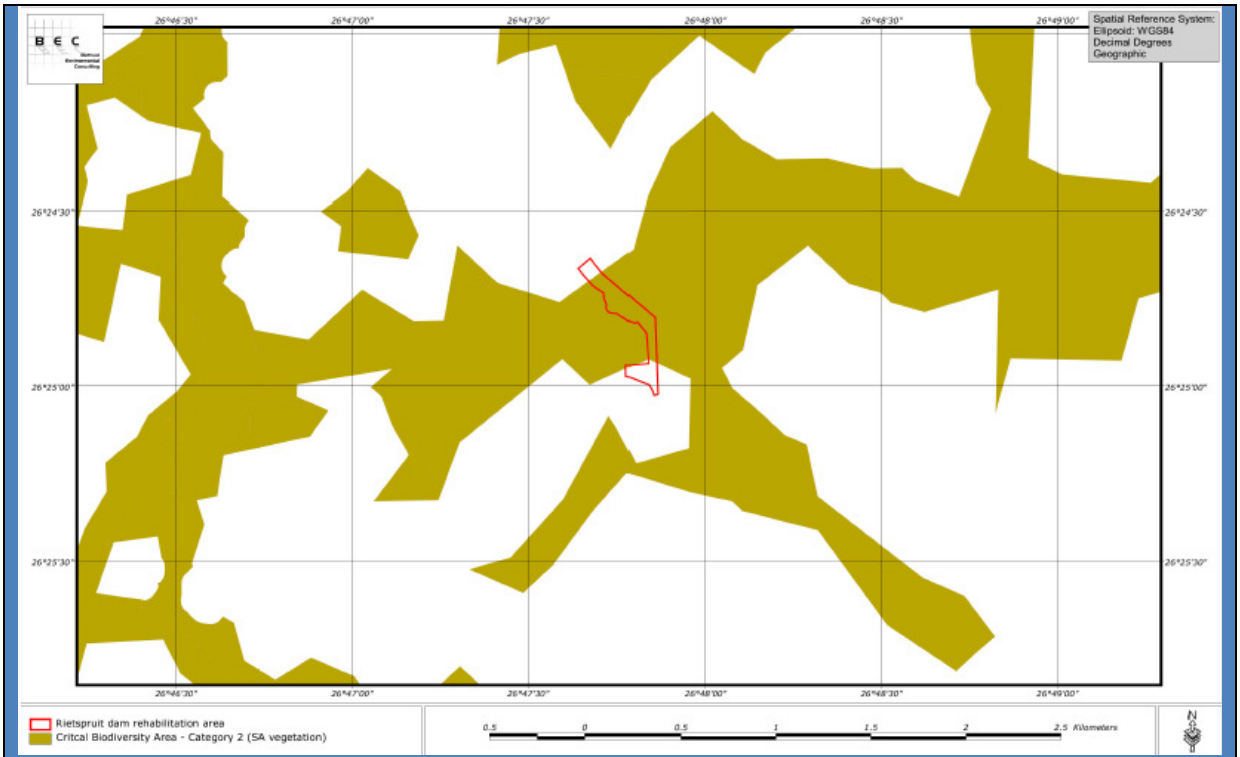


Figure 32: Conservation Planning Categories of the Study Area

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

Alternative 2

Natural area	Dam or reservoir
Low density residential	
	River, stream or wetland

If any of the boxes marked with an "N "are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not Applicable

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not Applicable

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not Applicable

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	YES	NO
Core area of a protected area?	YES	NO
Buffer area of a protected area?	YES	NO
Planned expansion area of an existing protected area?	YES	NO
Existing offset area associated with a previous Environmental Authorisation?	YES	NO
Buffer area of the SKA?	YES	NO

The North West Province Biodiversity Conservation Area (NWPCBA) Plan indicates that the proposed project site is situated within a CBA Category 2 area, comprising of conservation important Vaal-Vet Sandy Grassland (Endangered). Category 2 areas include parts of 'Near-natural landscapes' where (Refer to Figure 32) :

- Ecosystems and species are largely intact and undisturbed;
- Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for the loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets; and
- These are landscapes that are approaching but have not passed their limits of acceptable change.

Ideally, these parts of the landscape need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural, or near-natural, state then biodiversity conservation targets cannot be met. For CBAs, the impact on biodiversity of a change in land-use that results in a change from the desired ecological state is most significant locally at the point of impact through the direct loss of a biodiversity feature (e.g. loss of a populations or habitat). Fortunately, due to the small size of the proposed project, it is unlikely that natural habitat will be lost or adversely affected.

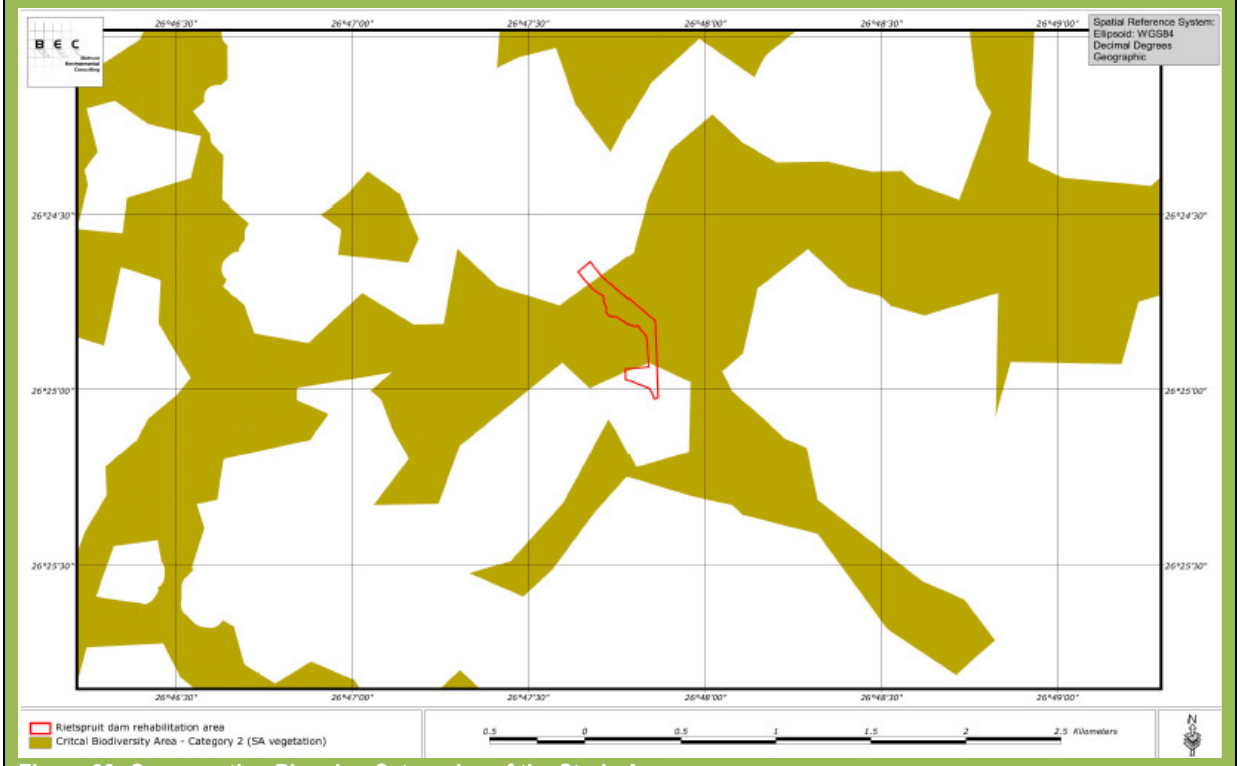


Figure 33: Conservation Planning Categories of the Study Area

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

YES

According to the Heritage Study conducted by Dr Johnny van Schalkwyk, Rietspruit Dam and its associated infrastructure is older than 60 years thus is protected by the National Heritage Resources Act (Act No 25 of 1999).

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

Will any building or structure older than 60 years be affected in any way? YES NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? YES NO

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

There will be some disturbance to the dam embankment wall and its associated infrastructure from the rehabilitation activities. A heritage report has been compiled to document all the aspects and features associated with the dam prior to construction and for the record. This report will be submitted to the South African Resources Agency (SAHRA) for comment and approval. The officials from SAHRA will advise on any requirements in terms of a heritage permit.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

In terms of the draft Ventersdorp Integrated Development Plan 2014/2015, most households in the area have a low income per annum. Approximately 60% of households earn less than R38 200 per annum.

Economic profile of local municipality:

Ventersdorp is a rural area characterised by a high unemployment rate, low literacy levels and agricultural farming. The main source of employment in Ventersdorp is agriculture (Ventersdorp IDP, 2014/2015).

Level of education:

According to the draft Ventersdorp IDP 2014/2015, Ventersdorp is an area with a low literacy rate (76.7% in 2011) with low skills levels although the number of people who completed Matric has increased in 2011 by 1,7%. The low skill levels can be attributed to the absence of a Higher Education Institution in the area. Thus there is a need for a Higher Education Institution such as a Technical College to encourage learners in furthering their studies after completing high school.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	This information will be provided by DWS in the final report.
What is the expected yearly income that will be generated by or as a result of the activity?	This information will be provided by DWS in the final report.
Will the activity contribute to service infrastructure?	YES
Is the activity a public amenity?	YES
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	This information will be provided by DWS in the final report.
What is the expected value of the employment opportunities during the development and construction phase?	This information will be provided by DWS in the final report.
What percentage of this will accrue to previously disadvantaged individuals?	This information will be provided by DWS in the final report.
How many permanent new employment opportunities will be created during the operational phase of the activity?	This information will be provided by DWS in the final report.
What is the expected current value of the employment opportunities during the first 10 years?	This information will be provided by DWS in the final report.
What percentage of this will accrue to previously disadvantaged individuals?	This information will be provided by DWS in the final report.

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)				The North West Province Biodiversity Conservation Area (NWPCBA) Plan indicates that the proposed project site is situated within a CBA Category 2 area, comprising of conservation important Vaal-Vet Sandy Grassland (Endangered).

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	10%	
Near Natural (includes areas with low to moderate level of alien invasive plants)	10%	
Degraded (includes areas heavily invaded by alien plants)	20%	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	60%	

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems		
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Endangered	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)	Estuary	Coastline
		YES	NO	NO

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

The study site is spatially situated in the Dry Highveld Grassland Bioregion and this grassland is further ecologically classified as the Vaal-Vet Sandy Grassland. This ecological type is only statutorily conserved in the Bloemhof Dam, Schoonspruit, Sandveld, Faan Meintjies, Wolwespruit and Soetdoring Nature Reserves. More than 63 % is currently transformed for cultivation (ploughed for commercial crops) and the rest under strong grazing pressure from cattle and sheep. The presence of the Declining geophyte Crinum bulbispermum was recorded within the proposed rehabilitation area, more specifically at the interface of the wall and the dam. Crinum species are threatened by harvesting for the medicinal plant trade. Preliminary Macro-Habitat Types include Aquatic habitat type (Rietspruit Dam); Deteriorated Grassland; Floodplain & Drainage Channel Wetland Types; Imperata cylindrica grassland; Phragmites reed stands; and Transformed Habitat & Dam Infrastructure. There are also wetlands found in the study area and these are seep wetlands and artificial wetlands. Locally threatened (Vulnerable) Grass-owls are also present in nearby wetlands.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	North West Independent Newspaper	
Date published	11 November 2015	
Site notice position	**Latitude**	**Longitude**
	26° 24' 35.12"S	26° 47'26.14"E
Date placed	09 October 2015	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2) (b) of GN 733

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (Tel number or e-mail address)
Mr. Ray Wewege	Johan Yssel Bootklub	(018) 264 2282 mazal@mweb.co.za
Ms.Anna Fransina Coetzee	Coepre Pty Ltd	018 484 4601

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
No Issues Raised Yet	No Response provided as yet.

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT	Ms. Khumoetsile Molatlhegi	(018) 387-7700		kmolatlhegi@nwpg.gov.za	Private Bag X2039, Mmabatho, 2735
North West Parks and Tourism Heritage House	Ms. Magodielo	(018) 397 1500		mmagodielo@nwptb.co.za	PO Box 4488, Mmabatho,2735
Sedibeng Water	Mr. Lebitso	(018) 392 2828		mlebitso@sedibengwater.co.za	132 University Drive, Mmabatho 2735
Ventersdorp Local Municipality	Mr. Gideon Moramedi	018 264 8529		Gideon@ventersdorp.co.za	Private bag 01010, Ventersdorp 2710

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A (2) of this report.

IMPACT ASSESSMENT DESCRIPTIVE CRITERIA		
Nature	Include a descriptive sentence	
Probability	Categories 1 – 5	
	1	Improbable (less than 24% chance of occurring)
	2	Probable (25 – 49%)
	3	Likely (50 – 69%)
	4	Very likely (70 – 89%)
	5	Definite (90 – 100%)
Frequency	Categories 1 – 5	
	1	Very rare to remote (once or twice a decade)
	2	Unusual to occasional (once or twice every 5 years)
	3	Frequent (a few times a month)
	4	Very frequent (a few times a week, to daily)
	5	Continuous (daily to a significant percentage of every day)
Extent	Categories 1 – 5	
	1	Footprint / site
	2	Local
	3	Regional
	4	National
	5	International (trans-boundary)
Duration	Categories 1 – 5	
	1	Short (few days to a few months, less than a phase)
	2	Short (few months, or less than a phase in total)
	3	Medium (a few years, significant part of a phase)
	4	Long (lifespan of development (i.e. all of operation))
	5	Permanent
Intensity	Categories 1 – 5	
	1	Very low – natural processes not affected
	2	Low – natural processes slightly affected
	3	Medium – natural processes continue but in a modified manner
	4	Medium-high – natural processes are modified significantly
	5	High – natural processes disturbed significantly so that they cease to occur (temporarily / permanently)
Significance	**Significance = P + F + E + D + I** Minimum value of 5, maximum of 25 Status determines if positive / negative	

IMPACT ASSESSMENT DESCRIPTIVE CRITERIA		
	Any positive value	**No impact** **1.** High to low consequence, probability not an issue as positive, **no mitigation required**
	1– 5	**Low** **2.** Low consequence, probably, **minimal mitigation may be required**
	6 to 10	**Medium** **3.** Medium consequence, probably, **mitigation is advised / preferred**
	11 to 15	**Medium–high** **4.** Medium to high consequence, probably to very probable, **mitigation is necessary**
	16 to 20	**High** **5.** High consequence, probably / definite, **mitigation is essential**
	21 to 25	**Extreme** **6.** Very high consequence, definite, **fatal flaw!**

1 (A).POTENTIAL IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
1. Supply of Municipal Services Shortage of municipal services supply.	**Duration:** Medium Term (3) **Extent:** Localised (2) **Frequency:** Frequent (3) **Probability:** Likely (1) **Intensity:** Medium (3) **Significant Rating: 12** **Medium High**	The project developer needs to secure sufficient basic municipal services (water, electricity) are in place prior to construction activities to ensure that no delays occur during construction.	**Duration:** Short Term (2) **Extent:** Localised (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (1) **Significant Rating: 8** **Medium**
2. Project Costs The implementation of alternative 1 will result in less budget costs because it has a smaller cross section shape and it only needs to be constructed at the deeper sections.	N/A	It is recommended that this alternative be considered for the project implementation.	N/A
3. Biodiversity There will be no significant impacts that will result on biodiversity features during the planning and design phase.	N/A	N/A	N/A
4. Heritage There will be no significant impacts that will result on heritage features during the planning and design phase.	N/A	N/A	N/A
5. Surface Water There will be no significant impacts that will result on surface water features during the planning and design phase.	N/A	N/A	N/A
INDIRECT IMPACTS			
None			
CUMULATIVE IMPACTS			
None			

ALTERNATIVE2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
1. Supply of Municipal Services Shortage of municipal services supply.	**Duration:** Medium Term (3) **Extent:** Localised (2) **Frequency:** Frequent (3) **Probability:** Likely (1) **Intensity:** Medium (3) **Significant Rating: 12** **Medium High**	The project developer needs to secure sufficient basic municipal services (water, electricity) are in place prior to construction activities to ensure that no delays occur during construction.	**Duration:** Short Term (2) **Extent:** Localised (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (1) **Significant Rating: 8** **Medium**
2. Project Costs The implementation of alternative 2 will result in high budget costs because it entails the re-grading of the slope which is expensive due to bigger cross section shape and it is also constructed across the whole length of the embankment.	**N/A**	This alternative is least preferred due to the cost implication and the large footprint of the embankment it requires for implementation.	N/A
3. Biodiversity There will be no significant impacts that will result on biodiversity features during the planning and design phase.	N/A	N/A	N/A
4. Heritage There will be no significant impacts that will result on heritage features during the planning and design phase.	N/A	N/A	N/A
5. Surface Water There will be no significant impacts that will result on surface water features during the planning and design phase.	N/A	N/A	N/A
INDIRECT IMPACTS			
None			
CUMULATIVE IMPACTS			

ALTERNATIVE2			
DIRECT IMPACTS			
Potential Impacts	Significance Rating	Mitigation Measure	Significant of Impact After Mitigation
None			

SUMMARY OF POTENTIAL IMPACTS AND AVERAGE POINTS ALLOCATED DURING THE PLANNING AND DESIGN PHASE

IMPACTS	Alternative 1: Without Mitigation	Alternative 1: With Mitigation	Alternative 2: Without Mitigation	Alternative 2: With Mitigation
1. Supply of Municipal Services	12	8	12	8
2. Biodiversity	0	0	0	0
3. Heritage	0	0	0	0
4. Surface Water	0	0	0	0
Total	**12**	**8**	**12**	**8**
INDIRECT IMPACTS				
None				
CUMULATIVE IMPACTS				
None				

1 (B).IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	Significance Rating	Mitigation Measure	Significant of Impact After Mitigation
1. Construction Impacts Movements of trucks, delivery of construction material, oil leakages from machinery and vehicles, disposal of construction waste, excessive noise etc. will constitute the main impacts during construction.	**Duration:** Medium Term (3) **Extent:** Localised (2) **Frequency:** Very Frequent (4) **Probability:** Likely (3) **Intensity:** Low (2) **Significant Rating: (14)** **Medium-High**	▪ Construction related wastes (solid & hazardous) and general waste must be collected regularly from the site and disposed of at an appropriate registered landfill site. ▪ Management of oil and other spillages	**Duration: Short Term (1)** **Extent: Localised (2)** **Frequency: Frequent (3)** **Probability: Probably (2)** **Intensity: Low (2)** **Significant Rating: (10)**

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
		and leakages must be minimized. ▪ Construction waste must not be stored more than 30 days on site. ▪ Dust suppression measures must be implemented by the appointed Contractor at the dam wall site and on haul roads to minimise dust nuisance in the surrounding communities. ▪ Construction activities must be undertaken during normal working hours (07H00 to 17H00) to minimise noise and disturbance of neighbouring landowners.	**Medium**
2. Biodiversity Impacts ▪ Loss of plant taxa of conservation importance concern; ▪ Loss/ displacement of animal taxa of conservation importance; ▪ Loss of habitat associated with plant and animal taxa of conservation importance; ▪ Local depletion of plant taxa and reduction of phytodiversity; ▪ Local depletion/ displacement of faunal species and reduction of animal diversity; ▪ Loss of atypical, sensitive, conservation important habitat types or ecosystems of restricted abundance; and	**Duration:** Medium Term (3) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: (11)** **Medium High**	▪ Avoid any surface disturbances within areas of high and medium-high floristic sensitive habitat types, especially the Imperata cylindrica Grassland Patch and the Floodplain & Drainage Channel Wetland Types which are regarded as particularly sensitive and any surface disturbances should be avoided where possible. ▪ Laydown areas, stockpiles, vehicle parking areas, road infrastructure, access roads, turning circles, maintenance areas, should be situated away from sensitive biodiversity areas and receptors.	**Duration:** Short Term (2) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Improbably (1) **Intensity:** Very Low(1) **Significant Rating: (7)** **Medium**

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
▪ Loss and alteration of ecological processes and ecosystem services.		▪ Disturbance of vegetation must be limited only to areas of construction. ▪ Prevent contamination of natural grassland and/ or wetlands from activities or any source of pollution. ▪ It must be ensured that none of the construction activities influence the natural faunal habitats of the study area – the Wetland Area and African Grass-Owl Habitat present in the study area must be excluded from all construction activities and associated impacts.	
3. Heritage Impacts ▪ There were no heritage impacts identified.	N/A	▪ It is recommended that should there be any heritage artefacts and features uncovered during the construction phase, these must be reported to the nearest museum for investigation.	N/A
4. Surface water ▪ Loss of wetland habitat would be likely to have a very important adverse impact on the owls and their continued presence at the site and in the area around the dam. ▪ Loss of wetland habitat due to construction activities. ▪ Impact on the wetland state and functionality due to transformation of	**Duration:** Medium (3) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Likely (3) **Intensity:** Medium (3) **Significant Rating: 13** **Medium High**	▪ Construction machinery is prohibited from the wetland areas. ▪ Existing fence to be retained in order to prevent access of machinery and construction workers into the wetland. ▪ No cement batching or any other similar activities must be conducted within 50m of the watercourse and wetland boundary, as delineated. ▪ No stockpiling of any material must be	**Duration:** Short Term (2) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 9** **Medium**

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
wetland habitat as a result of construction activities.		undertaken within the works area adjacent to the wetland. ▪ Stockpiling of excavated or other material must occur no closer than 50m to the boundary of the watercourse and wetland. ▪ Stormwater management must be practiced on the construction site. ▪ It is recommended that a low earthen berm or silt fence be erected along the edge of the wetland boundary.	
INDIRECT IMPACTS			
1. Biodiversity Impacts ▪ Impacts on habitat types that are associated with plants and animals of conservation importance (decreased habitat quality of surrounding areas due to peripheral impacts such as spillages, litter, increased erosion, contaminants, etc.); ▪ Alteration of faunal assemblages and community structures in surrounding areas (temporary displacement); ▪ Altered quality and ecological functionality (including fire, erosion) of surrounding natural habitat; ▪ Decreased aesthetic appeal of the landscape; and	**Duration:** Long Term (4) **Extent:** Local (2) **Frequency:** Very Frequent (4) **Probability:** Very Likely (4) **Intensity:** Low (2) **Significant Rating: 16** **High**	▪ Avoid any surface disturbances within areas of high and medium-high floristic sensitive habitat types, especially the Imperata cylindrica Grassland Patch and the Floodplain & Drainage Channel Wetland Types which are regarded as particularly sensitive and any surface disturbances should be avoided where possible. ▪ Laydown areas, stockpiles, vehicle parking areas, road infrastructure, access roads, turning circles, maintenance areas, should be situated away from sensitive biodiversity areas and receptors.	**Duration:** Short Term (2) **Extent:** Local (2) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: (11)** **Medium High**

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
▪ Exacerbated encroachment of invasive, exotic and encroacher plant species.		▪ Disturbance of vegetation must be limited only to areas of construction. ▪ Prevent contamination of natural grassland and/or wetlands from activities or any source of pollution. ▪ It must be ensured that none of the construction activities influence the natural faunal habitats of the study area – the Wetland Area and African Grass-Owl Habitat present in the study area must be excluded from all construction activities and associated impacts.	
CUMULATIVE IMPACTS			
1. Biodiversity Impacts ▪ Increased plundering of natural resources due to increased human encroachment; ▪ Exacerbation of existing levels of habitat fragmentation and isolation; and ▪ Cumulative impacts on local/ regional and national conservation targets and obligations (loss of natural grassland habitat).	**Duration:** Permanent (5) **Extent:** Local (2) **Frequency:** Very Frequent (4) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 15** **Medium High**	▪ Avoid any surface disturbances within areas of high and medium-high floristic sensitive habitat types, especially, the Imperata cylindrica Grassland Patch and the Floodplain & Drainage Channel Wetland Types which are regarded as particularly sensitive and any surface disturbances should be avoided at all cost. ▪ Laydown areas, stockpiles, vehicle parking areas, road infrastructure, access roads, turning circles, maintenance areas, should be situated away from sensitive biodiversity areas	**Duration:** Short Term (2) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Improbably (1) **Intensity:** Very Low (1) **Significant Rating: 7** **Medium**

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
		and receptors. ▪ Disturbance of vegetation must be limited only to areas of construction. ▪ Prevent contamination of natural grassland and/or wetlands from activities or any source of pollution. ▪ It must be ensured that none of the construction activities influence the natural faunal habitats of the study area – the Wetland Area and African Grass-Owl Habitat present in the study area must be excluded from all construction activities and associated impacts.	
2. Surface water ▪ Any loss of wetland habitat in the seep wetlands would constitute a cumulative impact as this would add to wetland loss associated with the (historical) development of the dam. This could result in an overall lowering of the Present Ecological State Class of the wetland.	**Duration:** Long Term (4) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 12** **Medium High**	The Contractor must ensure that the construction footprint does not impinge on the wetland area.	**Duration:** Medium Term (3) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 10** **Medium**

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
1. Construction Impacts Movements of trucks, delivery of construction	**Duration:** Medium Term (3)	▪ Construction related wastes (solid &	**Duration: Short Term (1)**

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
material, oil leakages from machinery and vehicles, disposal of construction waste, excessive noise etc. will constitute the main impacts during construction.	**Extent:** Localised (2) **Frequency:** Very Frequent (4) **Probability:** Likely (3) **Intensity:** Low (2) **Significant Rating: (14)** **Medium-High**	hazardous) and general waste must be collected regularly from the site and disposed of at an appropriate registered landfill site. ▪ Management of oil and other spillages and leakages must be minimized. ▪ Construction waste must not be stored more than 30 days on site. ▪ Dust suppression measures must be implemented by the appointed Contractor to minimise dust nuisance at the dam wall site and on haul roads in the surrounding communities. ▪ Construction activities must be undertaken during normal working hours (07H00 to 17H00) to minimise noise and disturbance of neighbouring landowners.	**Extent: Localised (2)** **Frequency: Frequent (3)** **Probability: Probably (2)** **Intensity: Low (2)** **Significant Rating: (10)** **Medium**
2. Biodiversity Impacts ▪ Loss of plant taxa of conservation importance concern; ▪ Loss/ displacement of animal taxa of conservation importance; ▪ Loss of habitat associated with plant and animal taxa of conservation importance; ▪ Local depletion of plant taxa and reduction of phytodiversity; ▪ Local depletion/ displacement of faunal	**Duration:** Medium Term (3) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: (11)** **Medium High**	▪ Avoid any surface disturbances within areas of high and medium-high floristic sensitive habitat types, especially the Imperata cylindrica Grassland Patch and the Floodplain & Drainage Channel Wetland Types which are regarded as particularly sensitive and any surface disturbances should be avoided where possible. ▪ Laydown areas, stockpiles, vehicle	**Duration:** Short Term (2) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Improbably (1) **Intensity:** Very Low(1) **Significant Rating: (7)** **Medium**

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
species and reduction of animal diversity; ▪ Loss of atypical, sensitive, conservation important habitat types or ecosystems of restricted abundance; and ▪ Loss and alteration of ecological processes and ecosystem services.		parking areas, road infrastructure, access roads, turning circles, maintenance areas, should be situated away from sensitive biodiversity areas and receptors. ▪ Disturbance of vegetation must be limited only to areas of construction. ▪ Prevent contamination of natural grassland and/or wetlands from activities or any source of pollution. ▪ It must be ensured that none of the construction activities influence the natural faunal habitats of the study area – the Wetland Area and African Grass-Owl Habitat present in the study area must be excluded from all construction activities and associated impacts.	
3. Heritage Impacts ▪ There were no heritage impacts identified.	N/A	▪ It is recommended that should there be any heritage artefacts and features uncovered during the construction phase, these must be reported to the nearest museum for investigation.	N/A
4. Surface water ▪ Loss of wetland habitat would be likely to have a very important adverse impact on the owls and their continued presence at the site and in the area	**Duration:** Medium (3) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Likely (3) **Intensity:** Medium (3)	▪ Construction machinery is prohibited from the wetland areas. ▪ Existing fence to be retained in order to prevent access of machinery and construction workers into the wetland.	**Duration:** Short Term (2) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (2)

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
around the dam. ▪ Loss of wetland habitat due to construction activities. ▪ Impact on the wetland state and functionality due to transformation of wetland habitat as a result of construction activities.	**Significant Rating: 13** **Medium High**	▪ No cement batching or any other similar activities must be conducted within 50m of the watercourse and wetland boundary, as delineated. ▪ No stockpiling of any material must be undertaken within the works area adjacent to the wetland. ▪ Stockpiling of excavated or other material must occur no closer than 50m to the boundary of the watercourse/wetland. ▪ Stormwater management must be practiced on the construction site. ▪ It is recommended that a low earthen berm or silt fence be erected along the edge of the wetland boundary.	**Significant Rating: 9** **Medium**
INDIRECT IMPACTS			
1. Biodiversity Impacts ▪ Impacts on habitat types that are associated with plants and animals of conservation importance (decreased habitat quality of surrounding areas due to peripheral impacts such as spillages, litter, increased erosion, contaminants, etc.); ▪ Alteration of faunal assemblages and community structures in surrounding	**Duration:** Long Term (4) **Extent:** Local (2) **Frequency:** Very Frequent (4) **Probability:** Very Likely (4) **Intensity:** Low (2) **Significant Rating: 16** **High**	▪ Avoid any surface disturbances within areas of high and medium-high floristic sensitive habitat types, especially the Imperata cylindrica Grassland Patch and the Floodplain & Drainage Channel Wetland Types which are regarded as particularly sensitive and any surface disturbances should be avoided where possible. ▪ Laydown areas, stockpiles, vehicle	**Duration:** Short Term (2) **Extent:** Local (2) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: (11)** **Medium High**

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
areas (temporary displacement); ▪ Altered quality and ecological functionality (including fire, erosion) of surrounding natural habitat; ▪ Decreased aesthetic appeal of the landscape; and ▪ Exacerbated encroachment of invasive, exotic and encroacher plant species.		parking areas, road infrastructure, access roads, turning circles, maintenance areas, should be situated away from sensitive biodiversity areas and receptors. ▪ Disturbance of vegetation must be limited only to areas of construction. ▪ Prevent contamination of natural grassland and/ or wetlands from activities or any source of pollution. ▪ It must be ensured that none of the construction activities influence the natural faunal habitats of the study area – the Wetland Area and African Grass-Owl Habitat present in the study area must be excluded from all construction activities and associated impacts.	
CUMULATIVE IMPACTS			
1. Biodiversity Impacts ▪ Increased plundering of natural resources due to increased human encroachment; ▪ Exacerbation of existing levels of habitat fragmentation and isolation; and ▪ Cumulative impacts on local/ regional and national conservation targets and obligations (loss of natural grassland habitat).	**Duration:** Permanent (5) **Extent:** Local (2) **Frequency:** Very Frequent (4) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 15** **Medium High**	▪ Avoid any surface disturbances within areas of high and medium-high floristic sensitive habitat types, especially, the Imperata cylindrica Grassland Patch and the Floodplain & Drainage Channel Wetland Types which are regarded as particularly sensitive and any surface disturbances should be avoided where possible.	**Duration:** Short Term (2) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Improbably (1) **Intensity:** Very Low (1) **Significant Rating: 7** **Medium**

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
		▪ Laydown areas, stockpiles, vehicle parking areas, road infrastructure, access roads, turning circles, maintenance areas, should be situated away from sensitive biodiversity areas and receptors. ▪ Disturbance of vegetation must be limited only to areas of construction. ▪ Prevent contamination of natural grassland and/ or wetlands from activities or any source of pollution. ▪ It must be ensured that none of the construction activities influence the natural faunal habitats of the study area – the Wetland Area and African Grass-Owl Habitat present in the study area must be excluded from all construction activities and associated impacts.	
3. Surface water ▪ Any loss of wetland habitat in the seep wetlands would constitute a cumulative impact as this would add to wetland loss associated with the (historical) development of the dam. This could result in an overall lowering of the Present Ecological State Class of the wetland.	**Duration:** Long Term (4) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 12** **Medium High**	The Contractor must ensure that the construction footprint does not impinge on the wetland area.	**Duration:** Medium Term (3) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 10** **Medium**

SUMMARY OF POTENTIAL IMPACTS AND AVERAGE POINTS ALLOCATED DURING THE CONSTRUCTION PHASE

IMPACTS	Alternative 1: Without Mitigation	Alternative 1: With Mitigation	Alternative 2: Without Mitigation	Alternative 2: With Mitigation
1. Construction	14	10	14	10
2. Biodiversity	11	7	11	7
3. Heritage	0	0	0	0
4. Surface Water	13	9	13	9
Total	**38**	**26**	**38**	**26**
INDIRECT IMPACTS				
1. Biodiversity	**16**	**11**	**16**	**11**
CUMULATIVE IMPACTS				
1. Biodiversity	**15**	**7**	**15**	**7**
2. Surface water	**12**	**10**	**12**	**10**

1 (C).IMPACTS THAT MAY RESULT FROM THE OPERATION

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
1. Residual impacts Residual impacts that arose during the construction phase and incorrect rehabilitation of construction-related access.	**Duration:** Long Term (4) **Extent:** Localised (2) **Frequency:** Very Frequent (4) **Probability:** Likely (3) **Intensity:** Low (2) **Significance Rating: (15)** **Medium–High**	▪ Care should be taken at all times to prevent any potential impacts on the environment that might result from operational activities. ▪ The dam wall and associated infrastructure must be maintained on a regular basis. ▪ Should there be any oil/fuel spills, these should be cleaned immediately and	**Duration:** Short Term (1) **Extent:** Localised (2) **Frequency:** Unusual (2) **Probability:** Likely (3) **Intensity:** Very Low (1) **Significance Rating: (9)** **Medium**

ALTERNATIVE 1			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
		disposed of at the appropriate hazardous landfill site. The surrounding communities should be encouraged to report any incidents that occur.	
2. Surface water Any incursion of people or machinery into the wetland area could damage wetland habitat and disturb fauna within the wetland.	**Duration:** Long Term (4) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 12** **Medium High**	▪ Should any maintenance activities need to be undertaken that require any physical works, the construction phase mitigation measures must be applied. ▪ It is very important that the fence line between the dam wall and the wetland be maintained to prevent any operational-phase incursion of people or vehicles into the wetland.	**Duration:** Medium Term (3) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 10** **Medium**
INDIRECT IMPACTS			
None			
CUMULATIVE IMPACTS			
None			

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
1. Residual impacts Residual impacts that arose during the construction phase and incorrect rehabilitation of construction-related access.	**Duration:** Long Term (4) **Extent:** Localised (2) **Frequency:** Very Frequent (4) **Probability:** Likely (3) **Intensity:** Low (2) **Significance Rating: (15)** **Medium–High**	▪ Care should be taken at all times to prevent any potential impacts on the environment that might result from operational activities. ▪ The dam wall and associated infrastructure must be maintained on a regular basis.	**Duration:** Short Term (1) **Extent:** Localised (2) **Frequency:** Unusual (2) **Probability:** Likely (3) **Intensity:** Very Low (1) **Significance Rating: (9)** **Medium**

ALTERNATIVE 2			
DIRECT IMPACTS			
Potential Impacts	**Significance Rating**	**Mitigation Measure**	**Significant of Impact After Mitigation**
		▪ Should there be any fuel/oil spills, these should be cleaned immediately and disposed of at the appropriate hazardous landfill site. The surrounding communities should be encouraged to report any incidence that occurs.	
2. Surface water Any incursion of people or machinery into the wetland area could damage wetland habitat and disturb fauna within the wetland.	**Duration:** Long Term (4) **Extent:** Footprint (1) **Frequency:** Frequent (3) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 12** **Medium High**	▪ Should any maintenance activities need to be undertaken that require any physical works, the construction phase mitigation measures must be applied. ▪ It is very important that the fence line between the dam wall and the wetland be maintained to prevent any operational-phase incursion of people or vehicles into the wetland.	**Duration:** Medium Term (3) **Extent:** Footprint (1) **Frequency:** Unusual (2) **Probability:** Probably (2) **Intensity:** Low (2) **Significant Rating: 10** **Medium**
INDIRECT IMPACTS			
None			
CUMULATIVE IMPACTS			
None			

SUMMARY OF POTENTIAL IMPACTS AND AVERAGE POINTS ALLOCATED DURING THE OPERATIONAL PHASE

IMPACTS	Alternative 1: Without Mitigation	Alternative 1: With Mitigation	Alternative 2: Without Mitigation	Alternative 2: With Mitigation
1. Residual impacts	15	9	15	9
2. Surface water	12	10	12	10
Total	**27**	**19**	**27**	**19**

IMPACTS	Alternative 1: Without Mitigation	Alternative 1: With Mitigation	Alternative 2: Without Mitigation	Alternative 2: With Mitigation
INDIRECT IMPACTS				
None				
CUMULATIVE IMPACTS				
None				

1 (D) POTENTIAL IMPACT THAT MAY RESULT FROM DECOMMISSIONING

Potential Impacts
The timing of the closure and decommissioning of the dam is unknown at this stage. However, when closure and decommissioning does take place, a separate EIA process will have to be conducted to address impacts that will result from closure.

A complete impact assessment in terms of Regulation 19(3) of GN 733 must be included as Appendix F.

2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative A (preferred alternative)

Construction activities can generate significant, if temporary, impacts as outlined above. However, when the construction and operational activities are managed appropriately, as outlined in the EMPr, the impacts on the environment are likely to be minimal and short-lived. It must be noted that the environmental assessment scoring of both alternatives 1 and 2 are the same due to the footprint and construction impacts of each alternative being similar. Although both alternatives will result in similar environmental impacts, alternative 1 is the preferred alternative due to the lower costs of implementation and the relatively small footprint which will be impacted during construction activities.

Alternative B

Construction activities can generate significant, if temporary, impacts as outlined above. However, when the construction and operational activities are managed appropriately, as outlined in the EMPr, the impacts on the environment are likely to be minimal and short-lived. It must be noted that the environmental assessment scoring of both alternatives 1 and 2 are the same due to the footprint and construction impacts of each alternative being similar. Although both alternatives will result in similar environmental impacts, alternative 1 is the preferred alternative due to the lower costs of implementation Alternative 2 is the least preferred alternative due to the higher costs of implementation and a slightly larger footprint along the dam wall embankment.

No-go alternative (compulsory)

If the proposed activity is not implemented as planned, this would constitute accepting an annual probability of dam failure of between 1:100 and 1:1000 years resulting in higher safety risks. Thus, this alternative is not preferred or acceptable.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	YES	

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

The findings of the Basic Assessment process and specialist studies undertaken to date, prior to the finalisation of the public participation process conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures contained in the EMPr are implemented. The specialist studies have flagged specific mitigation measures to address sensitive aspects in the local environment during construction.

The recommendations stemming from the Basic Assessment are:

- It is recommended that alternative 1 be implemented for the project, largely due to its financial benefits.
- The developer needs to ensure that adverse environmental impacts are minimised by implementing the mitigation measures provided in the Basic Assessment Report and Environmental Management Programme.

Is an EMPr attached?	YES	NO

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information