

## **BOTANICAL STATEMENT**

### **EKSTEENSKLOOF LOWER WEIR**

**REFURBISHMENT OF THE LOWER WEIR IN THE EKSTEENSKLOOF, FARM NO. 234/0 NEAR RIVIERSONDEREND, SWELLENDAM LOCAL MUNICIPALITY, WESTERN CAPE PROVINCE.**



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## **SUMMARY - MAIN CONCLUSIONS**

According to the Vegetation map of SA (Mucina & Rutherford, 2006) the weir is located within a vegetation type known as North Sonderend Sandstone Fynbos (not threatened), but it has little bearing on the stream itself which is an azonal ecosystem. The weir itself is located within an eroded riverbed in the lower slopes of the Eksteensklouf. Please note that the wetland specialist study refers to this as a Category C (Moderately modified) channeled valley bottom wetland, rather than a river with riparian habitat (based on wetland indicators defined by the Department of Water Affairs & Forestry, 2008).

The site visit showed that although the in-stream vegetation at the location of the weir is in relative good condition, it was and still is impacted by alien invader species (especially as one moves slightly downstream). Although the stream itself (at the location of the weir) seems to be fairly settled it is also slowly eroding its eastern banks, probably as a result of earlier flood events (e.g. 2008) combined with the impact from invasive alien plant species, generally with poor soil binding capacity (suppressing indigenous plants with good soil binding capability). This has resulted in the eastern riverbank slowly being eroded into already disturbed areas, such as the picnic / camping site. Fortunately, there is evidence of recent alien clearance on Farm 234, which includes the area in the vicinity of the weir.

Upstream of the weir, the vegetation becomes much more natural (even though still impacted by alien invader plant species – Refer to Figure 2). It was also quite evident that the eastern river bank was regularly used as a camping or picnic spot. It is clearly disturbed and a great many trees (most of which are indigenous to South Africa, but not indigenous to this area) were planted to enhance this picnic area. Further east, agriculture also left its mark on the lower slopes of the mountains. Unfortunately, alien trees, like Port Jackson and Black Wattle had in recent times invaded much of the downstream parts of the stream and the surrounding river banks and even adjacent areas.

Overall, the western banks of the stream and the in-stream vegetation show signs of alien infestation, but with good alien control it should be easy to revert it back to a more natural status (or significant improvement). The western bank of the stream (vicinity of the weir) is, however, in much poorer shape and was clearly disturbed in the past. Still with alien control it should also be able to revert back to a more natural status over time.

The restoration of the weir is certain to have an impact on the vegetation within the stream during the construction period. However, the impact will be temporary and must take into account the current status of the stream (alien infestation, existing disturbances and erosion).

Botanically speaking, the construction of the weir is not expected to have any significant long term impacts on vegetation, since the species encountered at the site is mostly hardy and relatively common species, which will re-establish themselves quite easily (as a result impact is considered low). **However**, the disturbance associated with the construction will very likely stimulate alien plant germination in the construction footprint, which will have a negative long term impact. It is thus essential that an ongoing alien eradication program is implemented at the weir and its immediate surroundings (e.g. a 20-50m boundary surrounding the weir location and all area impacted by construction footprint – including mixing and laydown areas). Preferably, or over time, it should also include the removal of the dense stands of alien invasive species upstream of the weir location.

## **INDEPENDENCE & CONDITIONS**

PB Consult is an independent consultant and has no interest in the activity other than fair remuneration for services rendered. Remunerations for services are not linked to approval by decision making authorities and PB Consult have no interest in secondary or downstream development as a result of the authorization of this proposed project. There are no circumstances that compromise the objectivity of this report. The findings, results, observations and recommendations given in this report are based on the author's best scientific and professional knowledge and available information. PB Consult reserve the right to modify aspects of this report, including the recommendations if new information become available which may have a significant impact on the findings of this report.

## **RELEVANT QUALIFICATIONS & EXPERIENCE OF THE AUTHOR**

Mr. Botes is a registered Professional Botanical, Environmental and Ecological Scientists at SACNASP (South African Council for Natural Scientific Professions) as required in terms of Section 18(1)(a) of the Natural Scientific Professions Act, 2003, since 2005 and holds a BSc. (Hons.) degree in Plant Ecology from the University of Stellenbosch (Nature Conservation III & IV as extra subjects).

Since qualifying with his degree, he had worked for more than 20 years in the environmental management field, first at the Overberg Test Range (a Division of Denel) managing the environmental department of OTB and being responsible for developing and implementing an ISO14001 environmental management system, ensuring environmental compliance, performing environmental risk assessments with regards to missile tests and planning the management of the 26 000 ha of natural veld, working closely with CapeNature (De Hoop Nature Reserve). In 2005 he joined Enviroscientific, an independent environmental consultancy specializing in wastewater management, botanical and biodiversity assessments, developing environmental management plans and strategies, environmental control work as well as doing environmental compliance audits and was also responsible for helping develop the biodiversity part of the Farming for the Future audit system implemented by Woolworths. During his time with Enviroscientific he performed more than 400 biodiversity and environmental legal compliance audits. During 2010 he joined EnviroAfrica in order to move back to the biodiversity aspects of environmental management. Experience with EnviroAfrica includes EIA applications, biodiversity assessment, botanical assessment, environmental compliance audits and environmental control work.

Yours sincerely,



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**CONTENTS**

Summary - main conclusions ..... i

Independence & Conditions ..... ii

Relevant qualifications & Experience of the author ..... ii

1. Introduction ..... 1

    1.1. Terms of reference..... 1

    1.2. Location & Layout ..... 2

    1.3. Evaluation method..... 3

    1.4. Activity description ..... 3

2. The Vegetation..... 4

    2.1. Vegetation encountered ..... 4

3. Recommendations ..... 7

4. References ..... 7

## 1. INTRODUCTION

EnviroAfrica CC was appointed to conduct an environmental assessment for the proposed repair of the Eksteenskloof weir on the remainder of Farm no. 234, the construction of a new pipeline from the weir to a proposed new dam, and the construction of the said new dam on Portions 3 and 5 of the Farm Van der Wattskraal No. 394, near Riviersonderend in the Overberg District Municipality (Western Cape Province). The Eksteenskloof weir requires reconstruction following a flood event in 2008.

- EnviroSwift (Pty) Ltd was appointed by EnviroAfrica to undertake a freshwater assessment with regards to the proposed project (Van de Haar, 2017) in support of the environmental impact assessment process.
- Bergwind Botanical Surveys & Tours CC was appointed by EnviroAfrica to carry out a botanical assessment (McDonald, 2017) of the designated property in support the environmental impact assessment process.

Whilst EnviroSwift addressed the repair of the weir, the proposed new pipeline and the location of the proposed new dam with regards to the proposed project, Bergwind Botanical Surveys & Tours CC, did not investigate the botanical elements in the vicinity of the weir (which was not in the original brief). As a result EnviroAfrica, asked PB Consult to visit the location of the weir and to make a brief statement on the vegetation and its status encountered at the weir and its immediate surroundings.

As a result, this short report only gives a short description of the botanical elements and its status encountered at the weir and its immediate surroundings. Since both the Freshwater and the Botanical, already gives a detailed description of general site and aspects like, climate, topography, conservation status etc., no further additional information was included in this report.

### 1.1. TERMS OF REFERENCE

The terms of reference for this appointment were to:

- Give a short statement on the vegetation and its conditions encountered at the location of the weir in the Eksteenskloof (which will be repaired).
- Determine and record the position of any plant species of special significance (e.g. protected tree species, or rare or endangered plant species) that should be avoided or that may require “search & rescue” intervention.
- Make recommendations on impact minimization should it be required

## 1.2. LOCATION & LAYOUT

The weir is located on the Remainder of the Farm 234, about 400 m northwest of the proposed new dam (Figure 1 & 2).



Figure 1: The location of the Eksteenskloof weir on Farm 234/0 in the lower reaches of the Eksteenskloof



Figure 2: Showing the weir and some of the most disturbed areas surrounding the weir

### **1.3. EVALUATION METHOD**

Desktop studies together with a site visit was performed to evaluate the proposed site in terms of potential impacts on botanical features of significance and to make recommendations on mitigation measures (should it be required). The site visit was conducted during January 2018. The timing of the site visit was reasonable in that essentially all perennial plants were identifiable.

### **1.4. ACTIVITY DESCRIPTION**

The proposed reconstruction of the weir will entail the rehabilitation of a steel-reinforced concrete weir with piped outlet works. The weir will have a maximum height of  $\pm 2,2\text{m}$ , a total length in the order of  $\pm 35\text{m}$  and a top width of  $\pm 300\text{mm}$ . It will be based on a foundation of about  $3,6\text{m}$  wide and will also be equipped with a downstream flush valve. The construction site will include the total footprint of the weir including related small works on the side as well as a maximum  $2\text{m}$  wide workspace along the length of the weir. Since the size of works is relatively small, not much extra area outside the  $2\text{m}$  construction strip would be necessary except for the area where operators would be able to park vehicles as near as possible to the site.

## 2. THE VEGETATION

According to the 2012 (beta 2) version of the Vegetation map of SA (Mucina & Rutherford, 2006) the weir is located within a vegetation type known as North Sonderend Sandstone Fynbos (not threatened), but it has little bearing on the stream itself which is an azonal ecosystem. The weir itself is located within an eroded riverbed in the lower slopes of the Eksteenskloof.

Greyton Shale Fynbos is expected just south of the weir in the more open valley. Mucina & Rutherford (2006) describe North Sonderend Sandstone Fynbos as an open, tall, proteoid-leaved evergreen shrubland with a dense moderately tall, ericoid-leaved shrubland as understory.

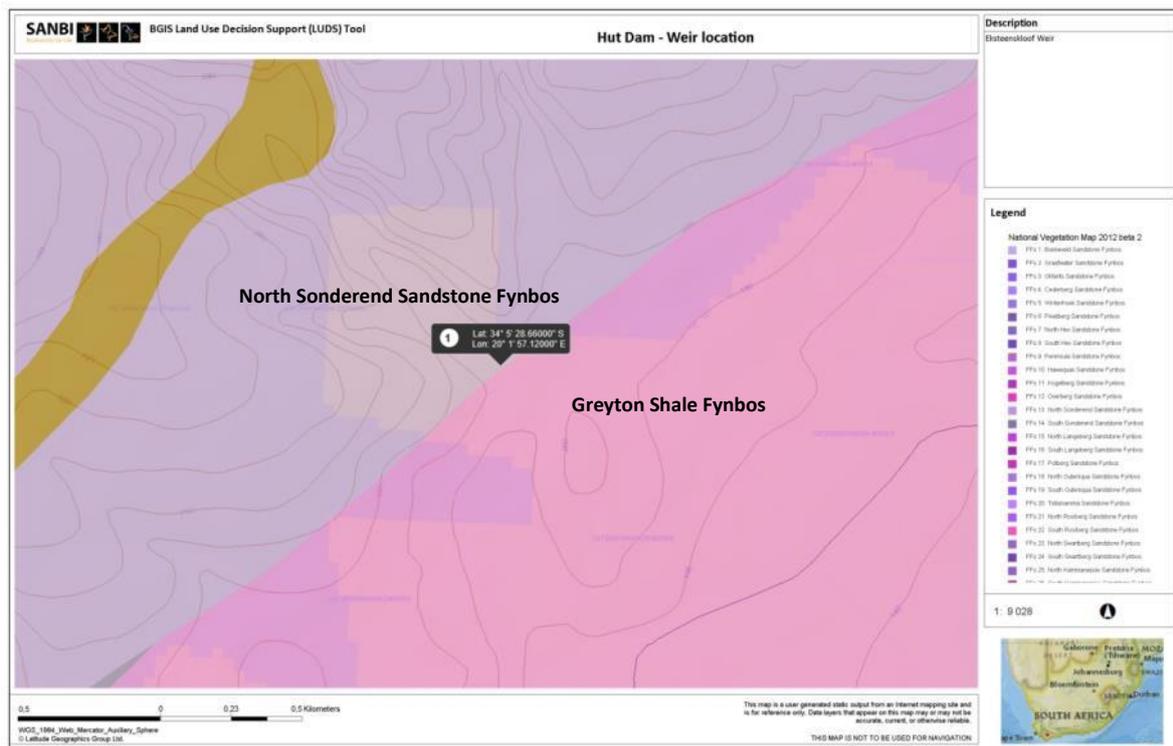


Figure 3: Vegetation map of South Africa (Mucina, Rutherford & Powrie, 2005) showing the weir location (co-ordinates) and the vegetation types expected in the vicinity of the weir.

### 2.1. VEGETATION ENCOUNTERED

The vegetation within the banks of the stream where the weir will be located is typical hardy azonal vegetation as one would expect in lower mountain streams. The stream itself is still in relative good shape, although it seems to be slowly eroding its eastern banks. This is probably the result of earlier flood events combined with the impact from invasive alien plant species, which generally have poor soil binding capacity (suppressing indigenous plants with good soil binding capability). This has resulted in the eastern riverbank slowly being eroded into already disturbed areas, such as the picnic / camping site. Fortunately, there is evidence of recent alien clearance on Farm 234, which includes the area in the vicinity of the weir. However, alien invasive species has left its mark. About 50m downstream of the weir, the in-stream vegetation has been severely compromised and almost replaced with dense Port Jackson (*Acacia saligna*) stands. Slightly north of the weir, dense patches of Black Wattle (*Acacia mearnsii*) were also still in evidence, which extends to the lower slopes of the mountains to the east and south of the weir (Figure 2). Pine trees (*Pinus* species) are also common

along the lower slopes of the mountain and also within the stream. Dense stands of bramble (*Rubus cf. fruticosus*) were also observed on the eastern banks of the stream in the vicinity of the picnic area.

Indigenous species observed within the stream and along the river banks includes the following: *Carpobrotus edulis*, *Cassytha ciliolate*, *Chrysanthemoides monilifera*, *Diospyros glabra*, *Elegia capensis*, *Empleurum unicusulare*, *Psoralea pinnata*, *Pteridium aquilinum*, *Pterocelastrus rostratus* (Red candlewood), *Stoebe plumose*, *Searsia angustifolia* (= *Rhus angustifolia*).



Photo 1: The location of the weir (See remains of old weir)



Photo 2: Looking upstream from the weir location (Black Wattle)



Photo 3: Showing erosion along the eastern banks of the stream



Photo 4: Port Jackson stands to the southwest of the weir



Photo 5: The old picnic area on the eastern banks of the stream



Photo 6: Agricultural land to the east of the stream

A number of trees were planted in the vicinity of the picnic area (Figure 2), which although they are indigenous to South Africa, is unlikely to have been found in this area. They includes at least one *Ficus natalensis*, one, *Ficus sur*, two *Podocarpus latifolius* (Yellowwood), 3-4 *Searsia lancea* (= *Rhus lancea*), one *Syzygium cordatum* and a number of *Vachellia karroo* (= *Acacia karroo*). These trees were probably planted as shade trees.

In general the western banks of the stream seems to be botanically still in very good condition (apart from alien invader species). The in-stream vegetation show signs of alien infestation, but with good alien control could easily be reverted back to almost original status. The western bank of the stream (vicinity of the weir) is, however, in much poorer shape and was clearly disturbed in the past (used as a picnic or camping spot). Still with alien control it should also be able to revert back to a more natural status over time.



Photo 7-10: Some of the indigenous trees planted for its shade at the old picnic area

### 3. RECOMMENDATIONS

Having evaluated the proposed site and its immediate surroundings, it is unlikely that the proposed development will lead to any significant impact on the biodiversity as a result of its placement. However, good environmental control should be applicable during the construction period in order to minimize impact.

The following impact minimization recommendations should be considered as part of the construction phase:

- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase.
- Cement mixing should be done on disturbed areas to the east of the weir (the old picnic site, or preferably further east on the agricultural land – aiming to be at least 50m away from the river bank, if possible).
- Before any work is done the site and access routes must be clearly demarcated (with the aim at minimal width/smallest footprint).
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of areas must be avoided.
- All alien plants must be removed from within the construction footprint and immediate surroundings.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
- An integrated waste management approach must be implemented during construction.

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