

BOTANICAL STATEMENT (Revision 1)

JADE HILLS DAM

**Proposed development a new dam and the re-development of existing agricultural land
on Portion 26 Of The Farm Stink Fontein 383, Ceres.
Witzenberg Local Municipality, Western Cape Province.**



12 February 2021

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SUMMARY - MAIN CONCLUSIONS

The owners of Jade Hills Farm (Portion 26 of the Farm Stink Fontein 383) would like to establish a relative small dam (approximately 1.7 ha in size) on the property. The new owners also plan to re-develop some of the existing agricultural lands on the property (which will only impact on existing developed land).

According to the 2012 (beta 2) version of the Vegetation map of SA (Mucina & Rutherford, 2006) the site is located within an area that historically would have been covered by Ceres Shale Renosterveld (a vulnerable vegetation type). However, the proposed dam will be located on cultivated land (wheat cultivation). Aerial imagery as well as BGIS land use results confirms the transformed status of the site as a result of past and present agricultural practices.

According to the Witzenberg spatial dataset of the WCBSP, the dam (or its proposed enlargement) does not fall within any CBA, but it overlaps proposed ecological support areas (Class 2) associated with the channeled valley bottom seasonal streams (Refer to the yellow areas shown in Figure 4). Again the water course has been degraded and probably transformed with no natural vegetation remaining. In order to rehabilitate this stream riparian vegetation would have to be sourced and replanted within the river corridor.

The site visit confirmed that no natural vegetation remains within the proposed development footprints apart from a few hardy and/or weedy species. Two patches of degraded natural veld, protected within two rocky ridges remains to the east of the dam and along the north-eastern boundary of the farm. However, these areas will not be impacted by the proposed development. The seasonal drainage lines (valley bottom wetlands) are degraded with no natural riparian vegetation remaining.

Botanically speaking the proposed development is not expected to have any significant long term impacts on vegetation, since the site is already transformed.

However, a couple of recommendations were made which could allow the re-establishment of at least a small ecological corridor and could also help to improve water quality. Properly designed and managed farm dams can attract a variety of birds, insects and animals to the area and so contribute to conservation of biodiversity (Refer to Figure 7 underneath)

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. Peet Botes 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 OTR 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 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 NEMA EIA applications, environmental management plans for various industries, environmental compliance audits, environmental control work as well as more than 70 biodiversity & botanical specialist studies.

Towards the end of 2017, Mr. Botes started his own small environmental consulting business focusing on biodiversity & botanical assessments, biodiversity management plans and environmental compliance audits.

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.

DECLARATION OF INDEPENDENCE

THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Petrus, Jacobus, Johannes Botes, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014, as amended, and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 13 of GN No. R. 326) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 13 of GN No. R. 326.

Note: The terms of reference must be attached.



Signature of the specialist:

PB Consult (Sole Proprietor)

Name of company:

12 February 2021

Date:

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1. INTRODUCTION

Jade Hills farm is located in the Ceres Valley, about 6 km east-south-east of Ceres. The property (Portion 26 of the Farm Stink Fontein No. 383) was recently bought by the neighbouring land owners. The new owners would like to construct a new dam with a provisional storage capacity of approximately 67 000 m³. The dam wall will have a maximum height of approximately 11.1 m, and will be about 240 m in length. The dam will cover an area of approximately 1.7 ha when finished. The purpose of the dam will be to store the existing winter water use from the Rietvalley Water Scheme for summer irrigation. The new owners also plan to re-develop some of the existing agricultural lands on the property.

Portion 26 of the Farm Stink Fontein 383 (hereafter referred to as the property of Jade Hills) is a relative small property (53 ha) with a relative flat, but undulating topography. Sarel Bester Consulting Civil Engineers was appointed to assess the farm in terms of location and design for the proposed dam (Sarel Bester, 2018). Because of the small size of and the topography of the property the proposed location is considered the only viable location in terms of cost of built and long term irrigation options. The proposed dam will for the most part overlay existing agricultural areas (wheat production) almost no remaining natural vegetation is expected (apart from a small patch of natural veld just outside of the proposed footprint). The agricultural development will only impact on existing agricultural land.

EnviroAfrica CC was appointed to conduct an environmental assessment for the proposed Jade Hills Dam. Since the property is located in an area that used to be covered by Ceres Shale Renosterveld (a vegetation type classified as Vulnerable in terms of the *"List of ecosystems that are threatened and in need of protection"*, GN 1002, December 2011), PB Consult was appointed to perform a botanical scan of the site and its immediate surroundings in order to determine potential impacts on botanical features of significance.

Desktop studies indicated that the area had been transformed as a result of intensive wheat cultivation, a view supported by aerial imagery and the latest BGIS land use maps. However, the Witzenberg CBA maps (part of the Western Cape Biodiversity Spatial Plan, 2017), shows ecological support areas (ESA2) associated with the valley bottom seasonal streams. A site visit was performed during January 2019, during which the site was walked and scanned for potential remaining botanical features of significance. The timing of the site visit was not great, in that Renosterveld is generally known for its rich bulb component and in addition the area was suffering from a severe drought. Still it was quite clear that the dam site and its surroundings had been transformed as a result of intensive agricultural practices over a long period of time.

A rocky ridge to the east of the proposed dam still seems to support some natural veld. However, this site had been impacted by a recent fire, making it difficult to evaluate how well the veld was preserved. Fortunately this area falls outside of the proposed dam and will not be directly impacted by the dam. Another rocky hill supports the same degraded natural vegetation to the north-east of some of the proposed agricultural development (between the existing dam and the agricultural area). However, this will also not be impacted by the proposed re-development (only existing agricultural land will be re-developed).

Based on the findings of the site visit and desktop studies the author is of the opinion that the site can only be described as transformed as a result of continuous intensive agriculture. Ideally an ecological corridor next to the seasonal drainage line should be protected and riparian vegetation should be re-established. However, at present there remains no natural riparian vegetation (and these sites were most probably ploughed and planted with the surrounding land). Thus in order to re-establish such an ecological support area with natural vegetation, the ESA would have to be physically replanted with riparian vegetation from other areas.

This report only gives a short description of the botanical elements and its status encountered at the site and its immediate surroundings and was not intended as a full botanical assessment. It is the opinion of the author that a full botanical assessment will not produce any significant additional information.

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 site and its immediate surroundings.
- 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

Jade Hills Farm refers to Portion 26 of the Farm Stink Fontein No. 383, a relative small property of about 53 h. It is located about 6 km east-south-east of Ceres in the Witzenberg local Municipality, Western Cape Province (Refer to Figure 1).

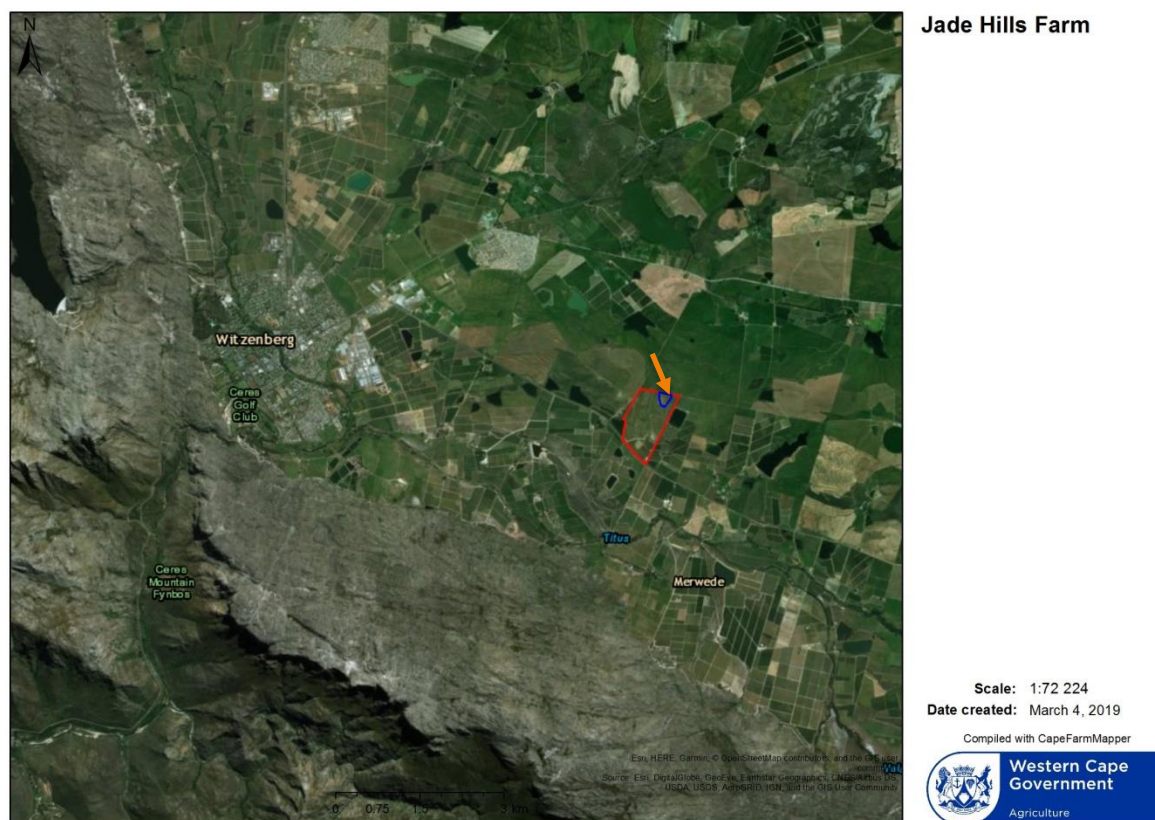


Figure 1: The location of the Jade Hills Dam (indicated by the arrow) within the property (in red)

The Jade Hill Dam (approximately 1.7 ha in size) will be located along the northern boundary of the property (Refer to Figure 2), with transformed agricultural land. However, a small seasonal drainage line runs through the proposed dam location. At present this drainage line can only be delineated by contour, any riparian or wetland vegetation has been compromised as a result of past agricultural practices. On evidence seen this drainage line has been cultivated as part of the larger agricultural land (ploughed and planted).

The agricultural land will overlap existing agricultural land and will exclude the two rocky ridges with its remaining (although very degraded) natural veld (Figure 2).

1.3. EVALUATION METHOD

1.4. ACTIVITY DESCRIPTION

Please note that existing agricultural land will be re-developed. Within the larger area there remain two rocky ridges with some remaining natural veld (very degraded at present). These ridges will not be developed and can be protected as ecological corridors (even though very small).

According to the Witzenberg spatial dataset of the WCBSP, the proposed dam does not fall within any CBA, but will overlap a proposed ecological support areas (Class 2) associated with the channeled valley bottom seasonal streams (Refer to the yellow areas shown in Figure 4).

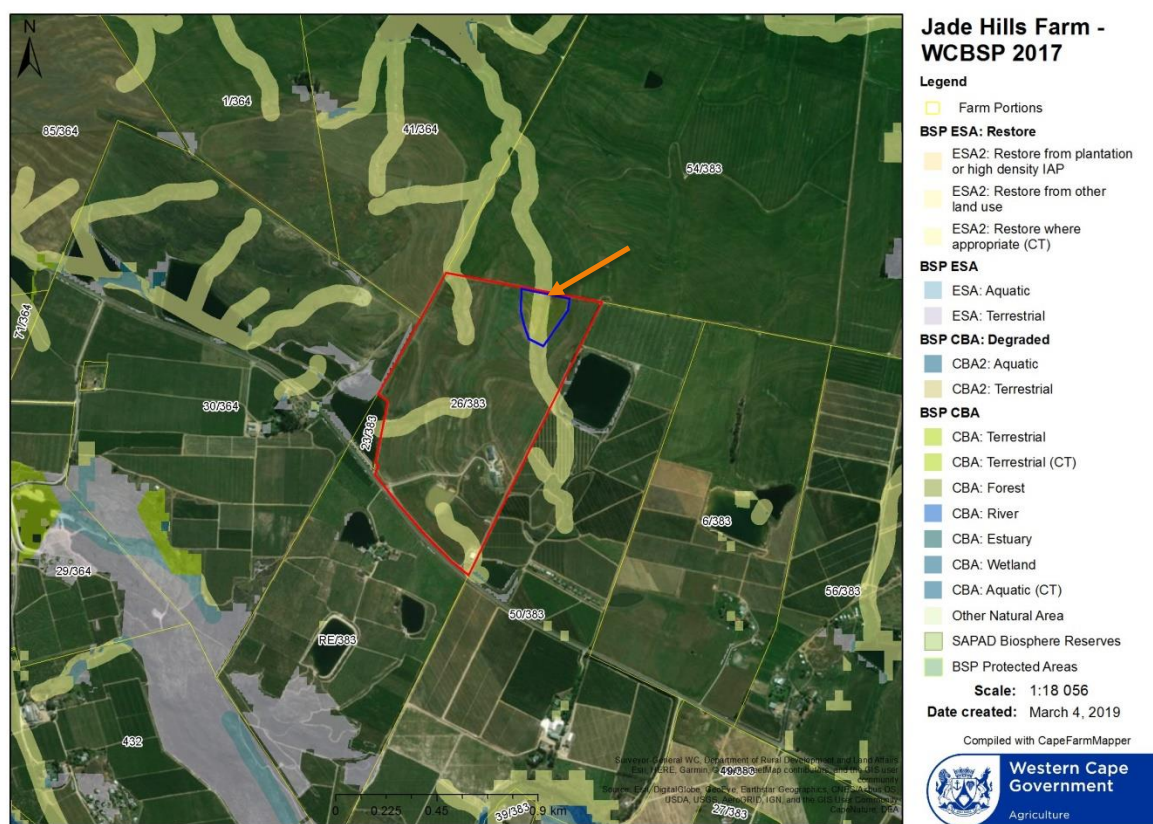


Figure 4: Western Cape Biodiversity Spatial Plan (2017) indicating the proposed dam location and surroundings

In this case the ecological support areas (Class 2) are delineations along the channeled valley bottom wetlands (seasonal streams). Ideally these areas should be restored to its natural state, but in this case restoration will require intervention as there is no more natural vegetation left. The valley bottom wetlands would have to be replanted with riparian vegetation brought in from similar locations (because there is no natural riparian vegetation left on the property).

However, it is always an excellent idea to let the inflow water to the dam run through a constructed or artificial wetland area. This will help to prevent siltation of the dam and will also help to clean the water not only from sediment, but also from various micro-elements that may be detrimental to water health. Such a wetland should be established in the water inlet area and can be a simple affair like a shallow v-shaped inlet that widens as it drains towards the dam (the longer and larger the better). This inlet should then be planted with reeds like *Phragmites australis* and / or *Typha capensis*, which will over time, establish itself in a dense mat, which will help filtering / cleaning the inlet water before it reaches the dam.

Properly designed and managed farm dams can attract a variety of birds, insects and animals to the area and so contribute to conservation of biodiversity.

4. NATIONAL LAND USE MAP

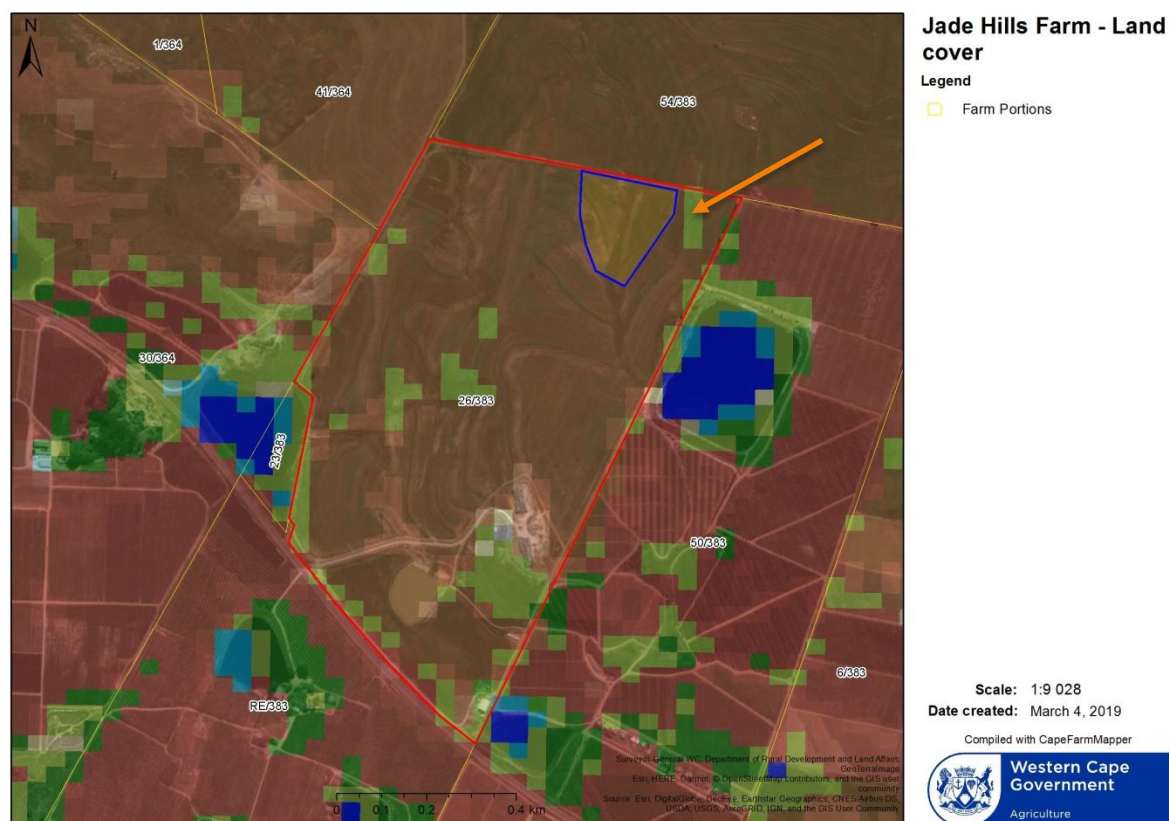


Figure 5: National Land Use map, indicating the status of the proposed site as a water body (Dam) within cultivated land

According to the National Land Use map, the dam is located within an area of cultivated land. This is consistent with the observations made during the site visit. The Orange arrow in figure indicates the rocky ridge which still seems to support some indigenous vegetation. Please note that this ridge will not fall within the dam footprint, but it could be managed to add to the ecological value of the dam, but extending this area into the dam and in doing so enhancing a potential ecological corridor.

5. VEGETATION ENCOUNTERED

Desktop studies supported by the 2013-14 national land-cover dataset indicated that the site and its immediate surroundings were most likely transformed as a result of cultivation (Refer to Figure 5 & 6). This was confirmed by the site visit. A recent fire has impacted on the proposed dam site and the surrounding area, which means that many plants were probably not visible that normally, would have been. However, the proposed dam site was clearly degraded to such an extent that it is considered highly unlikely that any natural vegetation of any significance will remain.

However, just east of the proposed new dam site, and along the eastern boundary of the property (marked by the arrows in Figure 6) two areas of degraded natural veld remains, protected within two rocky areas or ridges. Even though it was burned, many indigenous species could be identified. Some were re-sprouting, some were just re-emerging and some can be identified from remains. Both these area will not be impacted by the proposed development footprint and should be considered for protection as part of the proposed new ecological corridor and wetland area that is proposed as part of the development plan.



Figure 6: Google image, showing the proposed dam, cultivated land surrounding the dam and the two rocky ridges

No natural vegetation was encountered on the site or its immediate surroundings, apart from a few hardy species (e.g. *Asparagus* species and *Montinia caryophyllacea*) that persisted in a small rocky outcrop within the proposed dam footprint (Refer to Photo 1). Because of the recent fire, it was not easy to identify many of these plants past genus level.



Photo 1: The proposed dam site, looking from the bottom of the small valley to the top of the proposed dam (Note the small remaining rocky patch within the dam, which supported the only remaining indigenous species within the proposed dam site, as discussed above).

Apart from the above, no other natural vegetation remained within the proposed footprint (Refer to Photo 2-4). Photo 2 shows the small valley bottom seasonal water course associated with the ESA in Figure 4 (WCBS, CBA map). Although the fire had burned away any remaining plant species it is clear that the small stream had

not supported any significant shrub or tree species, in fact it seems as if any previous riparian vegetation had been replaced by a grassy cover.



Photo 2: The small seasonal valley bottom water course entering the dam (note the disturbance and absence of any riparian vegetation)

Photo 3 was taken from the inlet of the proposed new dam, down into the small valley that will become the dam (looking from south to north).



Photo 3: Looking over the proposed dam from north to south

The following photos all show the degraded status of the proposed dam site. Photo 1, 2, 4 & 5 shows the proposed dam site from all the angles.



Photo 4: Looking over the proposed dam from the western embankment



Photo 5: Looking over the proposed dam from the east (standing within the rocky ridge with its remaining natural veld)

Photo 6 & 7 shows the rocky ridge to the east of the proposed dam. Although a recent fire temporarily removed most of the vegetation cover it was still easy to determine that the vegetation supported by this ridge is be mainly indigenous. Because of the fire it was difficult to identify any plants further than genus level with any certainty.



Photo 6: The rocky ridge with remaining natural vegetation, to the east, and outside of the proposed footprint of the dam

The vegetation of the rocky ridge seems to have been (and still are) dominated by *Montinia caryophyllacea* (the common pepper bush), which can be seen re-sprouting in Photo 7. Other species observed includes a number of bulb species, *Searsia glauca*, *Asparagus* species, *Galenia africana* and *Stoebe* cf. *plumose*. All of these plants are either hardy shrubs or pioneer species.



Photo 7: The remaining vegetation on the rocky ridge

6. 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. The site and its immediate surroundings are considered transformed with no natural veld remaining. Only a few hardy indigenous species remains.

Recommendations on impact minimization are thus mostly limited to good environmental control (apart from potential positive off-sets):

- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase.
- Both areas of degraded natural veld indicated in Figure 7 (underneath) should be protected as remaining natural veld (Figure 7).
- 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.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.

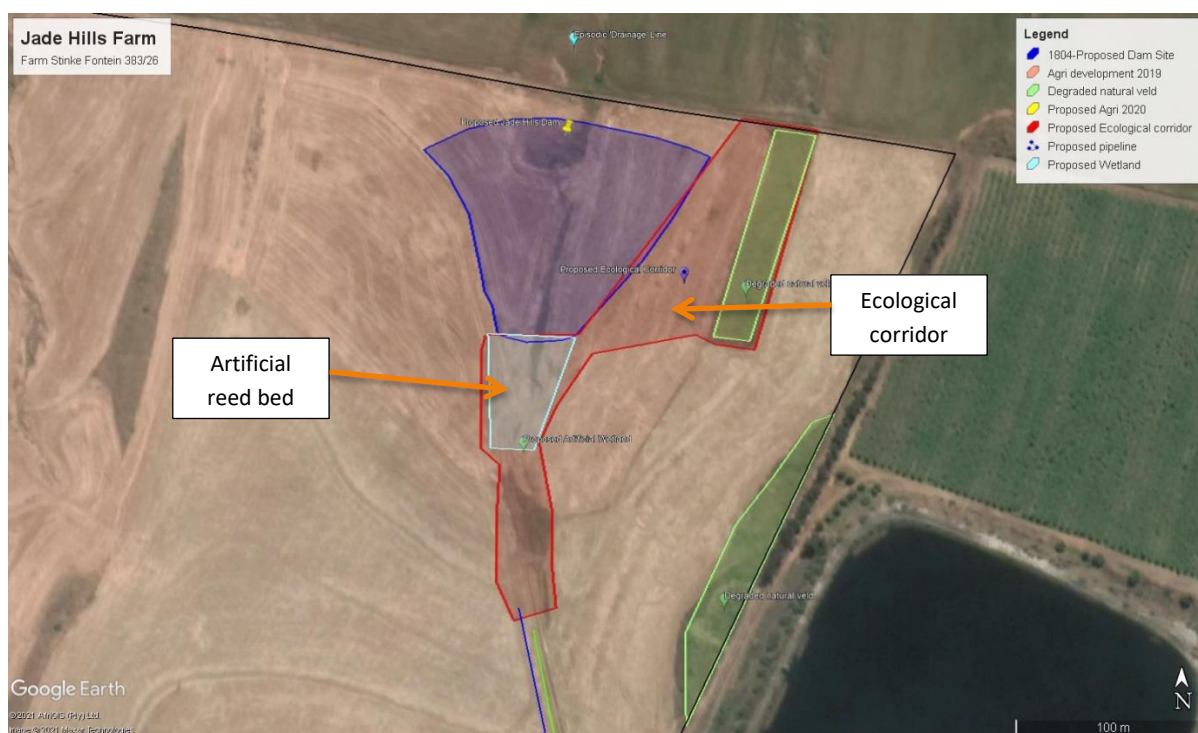


Figure 7: Sensitivity map showing potential positive spin-offs as recommended above

- An integrated waste management approach must be implemented during construction.
- It is recommended that a small artificial wetland is established where the small seasonal stream enters the dam and that all water from the Water Scheme are pumped to above this wetland, so that it will also enter the dam through the wetland. This inlet should then be planted with reeds like *Phragmites australis* and / or *Typha capensis*, which will over time, establish itself in a dense stand, which will help to clean the incoming water before it reaches the dam. Properly designed and managed farm dams can attract a variety of birds, insects and animals to the area and so contribute to conservation of biodiversity (Refer to Figure 7 underneath).
- A second potential positive spin-off could be to incorporate the remaining natural veld on the rocky ridge to the east of the dam within the dam site itself, by fencing it in with the dam, or by refraining from cultivating the land between the dam and the rocky ridge, so that a slightly larger natural corridor can be

established linking the artificial wetland with the remaining natural veld and with the dam (Refer to Figure 7).

7. REFERENCES

- De Villiers C.C., Driver, A., Brownlie, S., Clark, B., Day, E.G., Euston-Brown, D.I.W., Helme, N.A., Holmes, P.M., Job, N. & Rebelo, A.B. 2005.** Fynbos Forum Ecosystem Guidelines for Environmental Assessment in the Western Cape. Fynbos Forum, c/o Botanical Society of South Africa: Conservation Unit, Kirstenbosch, Cape Town.
- Driver A., Sink, K.J., Nel, J.N., Holness, S., Van Niekerk, L., Daniels, F., Jonas, Z., Majiedt, P.A., Harris, L. & Maze, K. 2012.** National Biodiversity Assessment 2011: An assessment of South Africa's biodiversity and ecosystems. Synthesis Report. South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria
- Driver, A., Maze, K., Rouget, M., Lombard, A.T., Nel, J.L., Turpie, J.K., Cowling, R.M., Desmet, P., Goodman, P., Harris, J., Jonas, Z., Reyers, B., Sink, K. & Strauss, T. 2005.** National spatial biodiversity assessment 2004: priorities for biodiversity conservation in South Africa. Strelitzia, 17. South African National Biodiversity Institute, Pretoria.
- Mucina, L. & Rutherford, M.C. (eds.) 2006.** The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.
- Pool-Stanvliet, R. 2017.** Western Cape Biodiversity Spatial Plan Handbook. CapeNature Scientific Services Land Use Team, Jonkershoek, Stellenbosch.
- Rouget, M., Reyers, B., Jonas, Z., Desmet, P., Driver, A., Maze, K., Egoh, B. & Cowling, R.M. 2004.** South Africa National Spatial Biodiversity Assessment 2004: Technical report. Volume 1: Terrestrial Component. Pretoria: South African National Biodiversity Institute.
- SANBI. 2006.** South African National Botanical Institute: Biodiversity GIS Home (as updated).
- SANBI. 2015.** Statistics: Red List of South African Plants version (as updated). Downloaded from Redlist.sanbi.org on 2017/06/15.
- Sarel Bester Engineers. 2018.** Jade Hills Dam. Preliminary Design Report for the building and commissioning of a Category II earthfill dam. Unpublished technical report done by Sarel Bester Engineers in partial fulfillment of a water use licence application in terms of Section 21 of the National Water Act, Act 36 of 1998. November 2018.