

BOTANICAL STATEMENT

Revised

DRIEFONTEIN DAM

**PROPOSED ENLARGEMENT OF AN EXISTING DAM ON PORTION 33 OF THE FARM RIETVALLEY
NO. 367, NEAR CERES, WITZENBERG LOCAL MUNICIPALITY, WESTERN CAPE PROVINCE.**



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SUMMARY - MAIN CONCLUSIONS

The proposed dam enlargement has been revised and now includes two phases. The original Botanical statement addressed Phase 1 of the dam enlargement. This revised report replaces the original report (Botes, 30 May 2018). In essence the revised report is precisely the same report (mainly addressing Phase 1), but it also includes statements on the proposed Phase 2 enlargement.

Phase 1 of the enlargement of the dam entails the excavation of approximately 10 000m³ of sediment/soil from the bottom of the dam to raise the dam wall from 7.4m to 8.95m in height, and lengthened the dam wall from 300m to 390m. The current concrete spillway will be removed and a new one will be constructed. The footprint of the dam will increase from approximately 10.51ha to 14.2ha.

During Phase 2, the dam wall will be further raised (from 8.95m to 9.55m in height) and lengthened (from 390m to 431m), which will increase the footprint of the dam from 14.2ha to 16.9ha.

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 a vegetation type known as Ceres Shale Renosterveld (Figure 2). Ceres Shale Renosterveld is classified as a vulnerable vegetation type in terms of “*List of ecosystems that are threatened and in need of protection*” (GN 1002, December 2011), promulgated in terms of the National Environmental Management Biodiversity Act, Act 10 of 2004. The existing dam, and the proposed enlargements, is located within an area subject to intensive wheat cultivation over a long period of time. 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 3). In this case the ecological support areas (Class 2) are delineations along the channeled valley bottom wetlands (seasonal drainage lines). Ideally these areas should be restored to its natural state. However, in this case restoration will require intervention as there is no more natural vegetation left (not even riparian vegetation).

According to the 2013-2014 National land cover dataset, the dam is located within an area of degraded cultivated land. This is consistent with the observations made during the site visit.

The site visit confirmed that no natural vegetation remains on the site or its immediate surroundings, apart from a few hardy (and mostly weedy) species on or just below the dam wall or within the uncultivated areas near the seasonal drainage lines. The most common plant encountered was the indigenous weed; *Gomphocarpus fruticosus* (associated with the dam and small drainage lines). Even the seasonal drainage lines (valley bottom wetlands) are degraded with no natural riparian vegetation remaining. The stream can only return to a more natural state if the entire landscape reverts to less farming and more natural catchment. It is unlikely that this would ever happen, because of the vested agricultural interests that have been entrenched in the region's economy since the country's early history.

Botanically speaking, neither Phase 1 nor Phase 2 of the proposed dam expansions is expected to have any significant long term impacts on vegetation, since the site is already transformed.

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. During 2017, Mr. Botes started to work full time in his own small business (PB Consult) as an independent environmental specialist.

Yours sincerely,



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1. INTRODUCTION

EnviroAfrica CC was appointed to conduct an environmental assessment for the proposed enlargement of the Driefontein Dam on Portion 33 of the Farm Rietvalley no. 367. The enlargement will be done in two phases.

During Phase 1 most of the earthworks will be within the existing dam, entailing the excavation of approximately 10 000m³ of sediment/soil from the bottom of the dam to raise the dam wall from 7.4m to 8.95m in height, and lengthened the dam wall from 300m to 390m. The current concrete spillway will be removed and a new one will be constructed. The footprint of the dam will increase from approximately 10.51ha to 14.2ha.

During Phase 2, the dam wall will be further raised (from 8.95m to 9.55m in height) and lengthened (from 390m to 431m), which will increase the footprint of the dam from 14.2ha to 16.9ha.

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 2018, 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. Apart from single hardy and mostly weedy indigenous species, no remaining natural veld was encountered. It is also highly unlikely that bulbs would have survived the prolonged period of intensive cultivation. Aerial imagery indicates that the land owners do maintain a small ecological corridor next to the seasonal drainage lines, but even so, almost no riparian vegetation remains.

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 lines should be protected and riparian vegetation should be allowed to re-establish or replanted. At present, however, there remains almost no natural veld or even plant species to facilitate natural reclamation. In other words it is likely to require intervention in order to even re-establish such an ecological support area with natural vegetation.

This short 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

The farm, Portion 33 of the Farm Rietvalley No. 367 is located just east of Ceres (approximately 8 km away) in the Witzenberg local Municipality, Western Cape Province. The property is about 522.084 ha in size, with the existing dam located towards the north of the property (Refer to Figure 1).

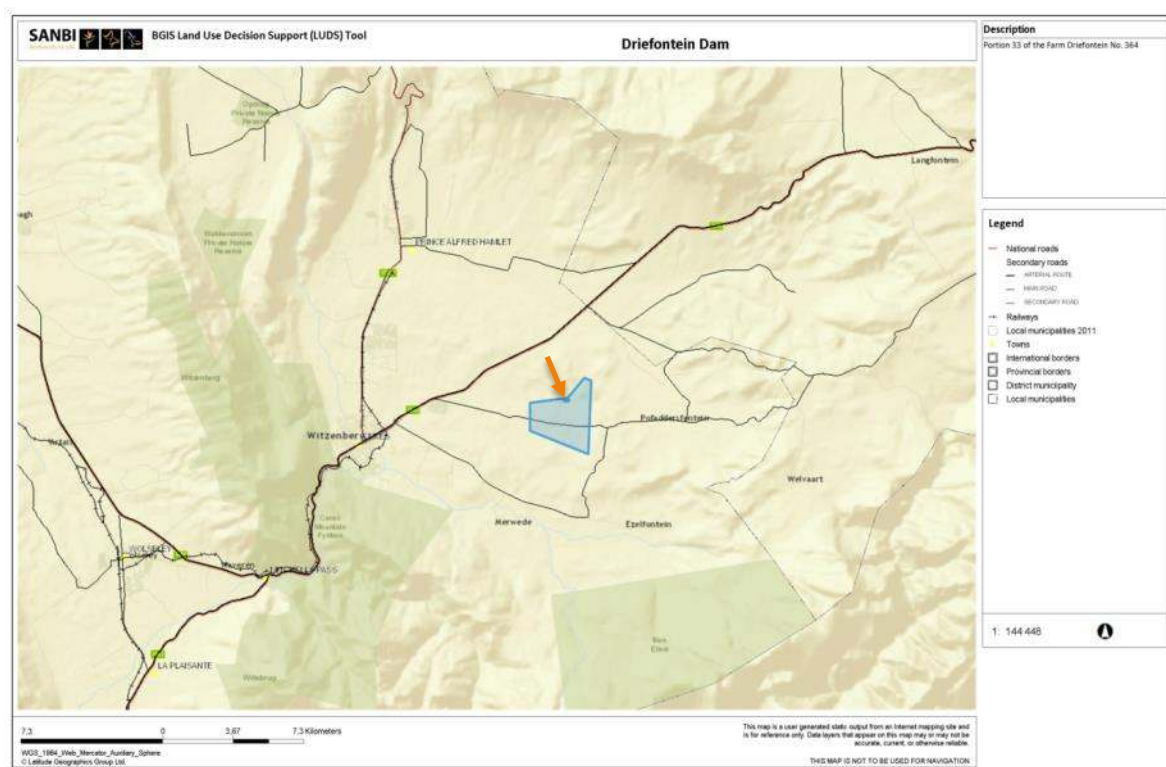


Figure 1: The location of the Driefontein Dam (indicated by the arrow) within the property (in blue)

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 not ideal, as the area was experiencing a severe drought. In addition Renosterveld is generally known for being rich in bulb species, of which most will only be visible spring. Non-the-less, the site is so degraded as a result of

agricultural practices (over a long period of time) that it is considered highly unlikely that any significant amount of bulb species would have survived these practices.

1.4. ACTIVITY DESCRIPTION

The owners (Agterfontein Trust) proposed the enlargement of the existing Driefontein Dam on Rietvalley Farm, of which an existing water use license exists. The existing dam did not provide enough storage capacity on the farm for winter listed water. The proposed enlargement of the Driefontein Dam would allow for the storage of winter listed water for summer irrigation, providing a more efficient use of an already existing water use. There is thus no need to apply for a new water use license.

The proposed enlargement will be done in two phases. According to the preliminary design reports the proposed Phase 1 and Phase 2 enlargement of Driefontein Dam (Portion 33 of Farm Rietvalley 364) will have following measurements:

Description	Existing Dam	Phase 1 Enlargement	Phase 2 Enlargement
Wall length	300 m	390 m	431 m
Wall height	7,4 m	8,95 m	9,55 m
Net storage capacity	239 000 m ³	±321 000 m ³	±420 000m ³
Total Footprint	10.51ha	14,20ha	16,90ha
Total earthworks		17 800 m ³	25 000 m ³

Phase 1

No new water will be extracted but if enlargement is granted the dam will have the capacity to store an additional 82 000m³ of water per year.

10 000m³ of ground will be removed from the bottom of the dam to be used to enlarge the dam wall. The current concrete spillway will be removed and a new one will be constructed on the exact predetermined elevation to precisely provide for the design capacity of the enlarged dam. Of importance is that the Driefontein Dam, which is located approximately in the middle of the valley, is not naturally connected to any rivers that flow out of the surrounding mountains. It has a small catchment of its own. **In effect the footprint will remain very much the same.**

The dam wall is to be raised with one metre to store 82 000 m³ more water. The raising of the dam wall would merely store water that is now flowing through to downstream farming operations. None of this water is currently flowing back to any river and therefore is not making any contribution to river health and the aquatic ecology. The raising of the dam wall is not about to bring any change in the *status quo* (Sarel Bester Engineers, 2018).

Phase 2

The dam wall will be further lengthened by about 41m (from 390m to 431m). The height of the dam will be raised from 8.95m to 9.55m and the footprint of the dam will increase from 14.2 ha to 16.9 ha.

2. THE VEGETATION

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 a vegetation type known as Ceres Shale Renosterveld (Figure 2). Ceres Shale Renosterveld is classified as a vulnerable vegetation type in terms of “*List of ecosystems that are threatened and in need of protection*” (GN 1002, December 2011), promulgated in terms of the National Environmental Management Biodiversity Act, Act 10 of 2004. The existing dam (and the proposed enlargement) is located within an area subject to intensive wheat cultivation over a long period of time. Aerial imagery as well as BGIS land use results indicates that the site is most likely to be transformed as a result of past and present agricultural practices.

Mucina & Rutherford (2006) describe Ceres Shale Renosterveld as medium tall cupressoid-leaved shrubland dominated by renosterbos, located on moderately undulating plains and lower mountain slopes, with heuweltjies (old termite mounds) prominent in places.

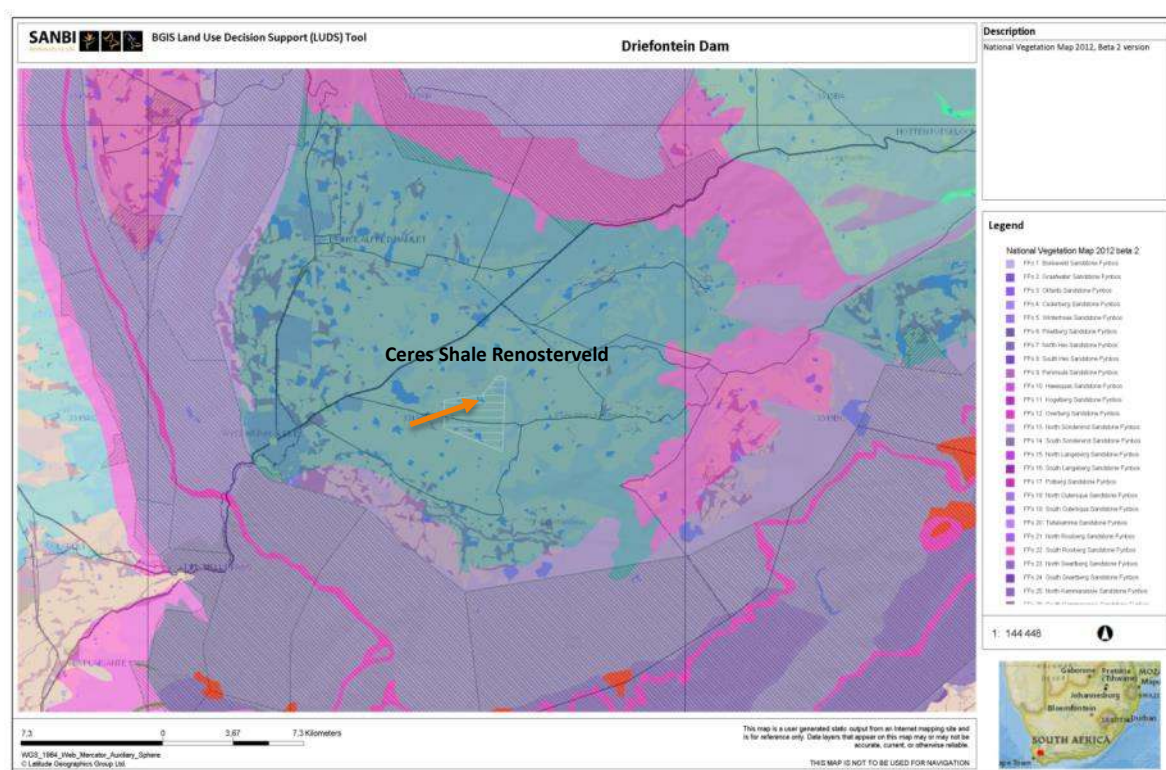


Figure 2: Vegetation map of South Africa (Mucina, Rutherford & Powrie, 2005) showing the property location

3. WITZENBERG CRITICAL BIODIVERSITY MAP

The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) includes a map of biodiversity importance for the entire province, covering both the terrestrial and freshwater realms, as well as major coastal and estuarine habitats (Pool-Stanvliet, 2017). The WCBSP is the product of a systematic biodiversity plan that delineates, on a map, Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services.

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 3).

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 4 & 5). This was confirmed by the site visit.



Figure 5: Google image, showing the existing dam and cultivated land surrounding the dam (note the narrow, uncultivated areas associated with the small valley bottom seasonal drainage lines)

No natural vegetation was encountered on the site or its immediate surroundings, apart from a few hardy (and mostly weedy) species on or just below the dam wall or within the uncultivated areas near the seasonal drainage lines. The most common plant encountered was the indigenous weed; *Gomphocarpus fruticosus* (associated with the dam and small drainage lines).



Photo 1: The dam wall showing its transformed status with only the weedy *Gomphocarpus fruticosus* remaining along its slopes

The only other indigenous species encountered was two individuals of the small tree, *Vachellia karroo* (= *Acacia karroo*), one individual of the shrubby *Diospyros lycioides* (surviving next to the old pump house), and a few individuals of the hardy shrub *Athanasia* cf. *trifurcata*.



Photo 2: Looking over the existing dam from southwest to northeast

Photo 1 – 3 clearly show the transformed status of the area, with no natural veld remaining. It also clearly indicates that the site was subject to agriculture over a long period of time and as a result it would be highly unlikely for any natural vegetation to remain.



Photo 3: Looking over the existing dam from east to west

Photo 4 similarly shows the degraded status of the seasonal drainage lines (valley bottom wetlands) feeding into the dam. Ideally these drainage lines should be rehabilitated by trying to re-establish natural riparian vegetation along these streams and protecting them from grazing. In order for this to have a significant effect this should be supported by neighboring property owners as well.

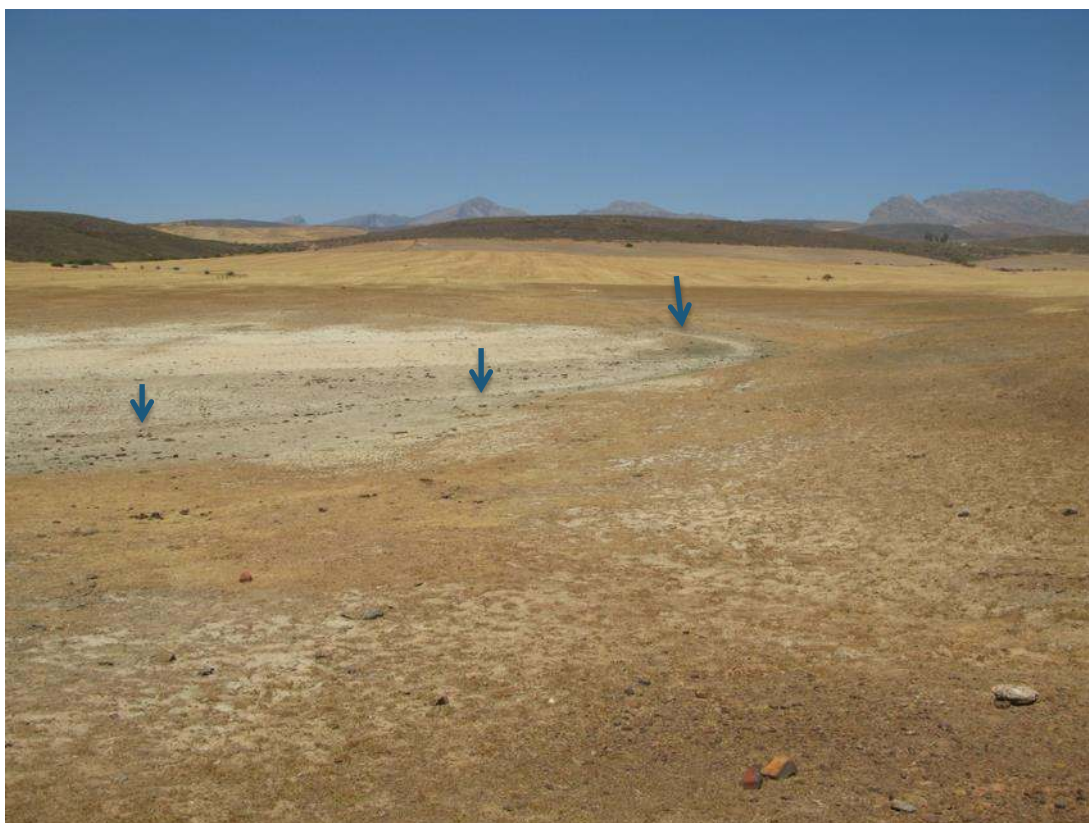


Photo 4: Showing the status of the incoming seasonal drainage line (no riparian vegetation remaining)

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 one potential positive off-set):

- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase.
- 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.
- Ideally ecological support areas should be established along the small streams (similar to those already implemented – Refer to Figure 5). As a potential off-set the re-establishment and protection (fencing them off) of a more natural riparian vegetation along these streams should be considered. But this will be difficult as the area has been subject to intensive agriculture over a long period of time.

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