BIODIVERSITY SURVEY: PROPOSED BATCHING PLANT ON ERF 4886 AT MACASSAR

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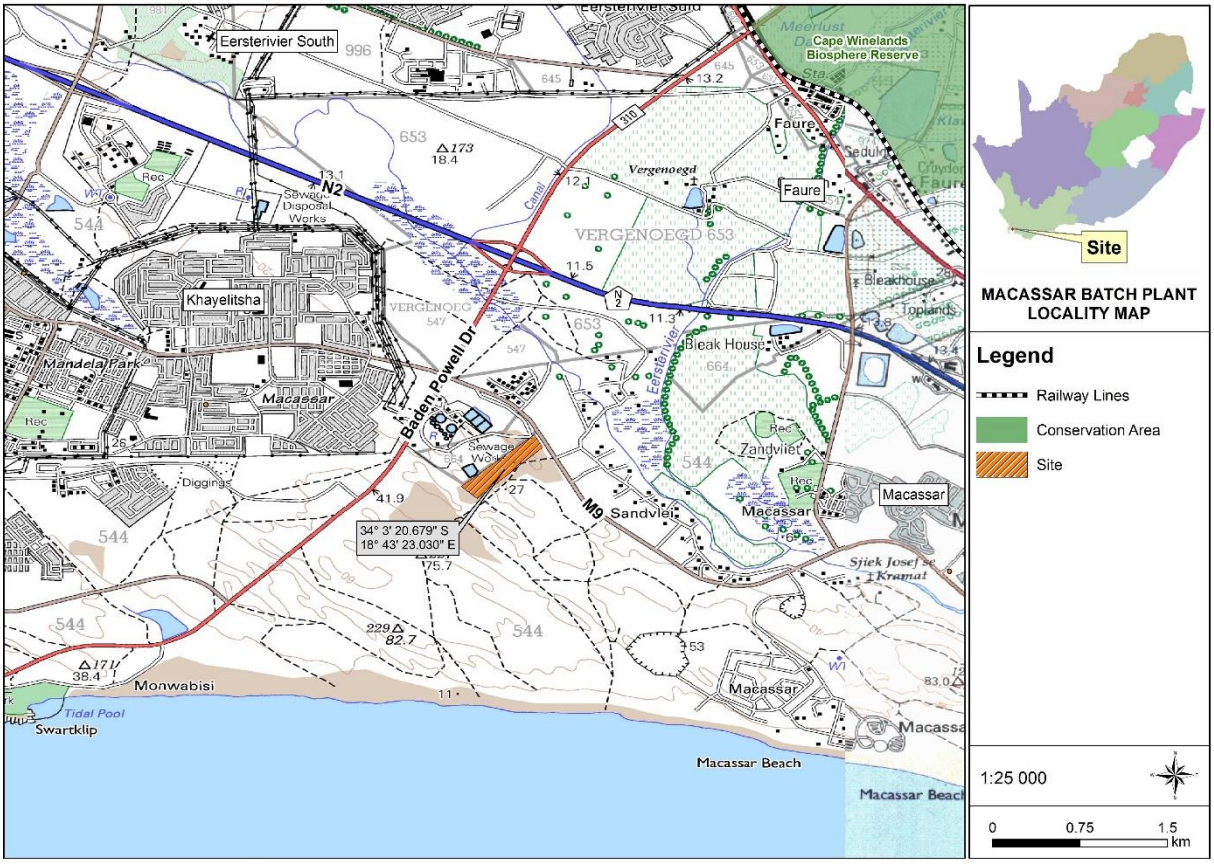
1 INTRODUCTION

This report investigates the biodiversity impacts of a proposed batching plant on Erf 4886, between Macassar and Khayelitsha (see Map 1). The site (±8.7 ha) is located on a flat, sandy area close to Macassar Road (M9), 2.5 km west of Macassar. It is covered by degraded strandveld vegetation, infested with woody aliens (rooikrans and port jackson). The aim of the study, which was requested by Afrimat, is to determine the biodiversity value of the affected area, the anticipated impact imposed by the project, and to recommend mitigation measures to minimise the impact. This assessment was undertaken by Mark Berry, a biodiversity specialist who's contact details appear in the abbreviated CV, attached.



Map 1 Topographical map showing the location of the property (brown area) east of Baden Powell Drive and Khayelitsha.

2 PROJECT DESCRIPTION

The following description of the project has been extracted from the town planning motivation report (dated July 2020) prepared by Setplan. As illustrated on Map 2, the development will include the following:

(i) A fenced and gated 3 965 m² site accessed via a 10 m wide access road (existing subject to widening) on Erf 4886 to Macassar Road (M9). It is currently unknown where exactly

the batching plant will be positioned on site.

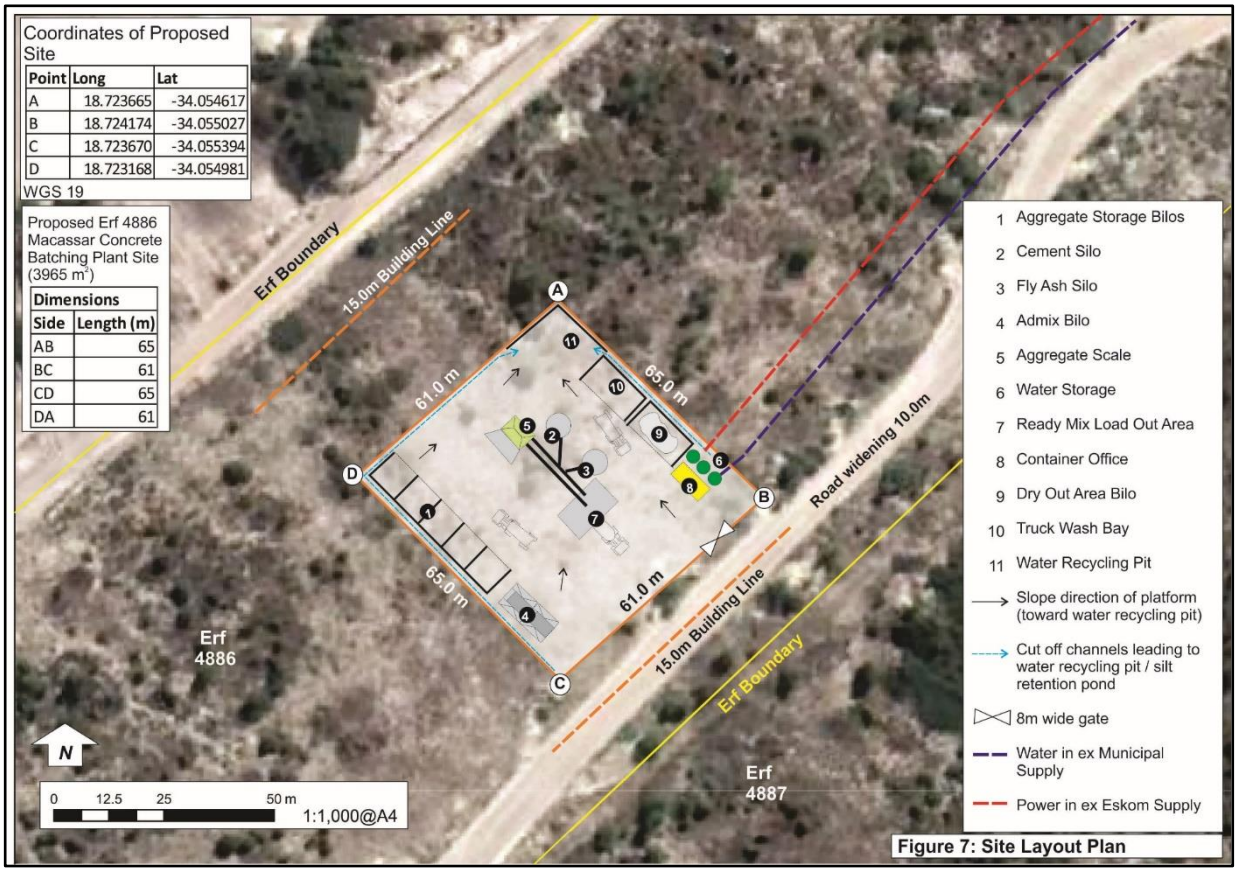
(ii) A ±27 m² prefabricated double storey complex (i.e. container offices) including access control, batch control room, offices, storage room and staff amenities and toilets, originally contract managed chemical toilets during construction, followed by flush sanitation to a conservancy tank.

(iii) A mobile batching plant unit, which includes, but is not limited to, hoppers, compressor, conveyors, and 2 cement/ fly-ash silos of approximately 14 m in height, 2.5 m in diameter and having an overall storage capacity of 200 tons.

(iv) Aggregate storage bins.

(v) Fine material and solids dry-out bunkers.

(vi) Additional support infrastructure including a water recycling pit and pond, mixer truck wash-bay, water storage tank, additive (Admix) storage tank, and mixer-truck, front-end loader and staff vehicle parking/storage areas.



Map 2 Provisional site layout for the proposed batching plant (final location may differ).

In accordance with the temporary nature of the application (i.e. a temporary departure) it is noted that the majority of the infrastructure is mobile, facilitating any future removal of the batch plant and rehabilitation of the site, with built structures being restricted to:

(i) Foundations or footings.

(ii) Walls (±3 m high) to form the aggregate bins.

(iii) Floor and 1 m high walls enclosing the wash-out and dry-out bunkers, and water recycling ponds.

(iv) Surface sealing (concrete) of all wet areas to facility drainage of spillage and run-off to the dry-out bunker and water recycling pond.

3 TERMS OF REFERENCE

The terms of reference for this study are as follows:

- Identify and describe biodiversity patterns at a community and ecosystem level (main vegetation type, plant communities and threatened/vulnerable ecosystems), at species level (Species of Conservation Concern, protected species, presence of alien species) and in terms of significant landscape features;
- Describe the sensitivity of the site and its immediate surroundings;
- Map the distribution and infestation levels of invasive alien plants;
- Identify and describe the impacts imposed by the project on biodiversity and propose mitigation measures to minimise or soften the impact;
- Review the relevant biodiversity plans compiled in terms of the National Environmental Management Biodiversity Act (Act 10 of 2004); and
- Adhere to the Department of Environmental Affairs & Development Planning (DEA&DP) and CapeNature guidelines for biodiversity studies in the Western Cape, as well as the NEMA EIA requirements for specialist studies.

4 METHODOLOGY

Biodiversity surveys of the site were undertaken on 12 February and 13 August 2020, and again on 8 May 2021 by Mark Berry, an independent biodiversity specialist (see CV attached). Several surveys were needed (requested) as the applicant is uncertain where to position the batching plant. A qualitative assessment of the type and condition of affected vegetation on site, disturbances and presence of alien species, Species of Conservation Concern and protected species was carried out. Plant species not identified in the field, were collected or photographed and identified at office. The South African vegetation map and latest floristic taxonomic literature and reference books were used for the purpose of this study. Any plants classified as rare or endangered in the Red List of South African Plants online database are highlighted. NEMA, Brownlie's (2005), CapeNature and other relevant guidelines for biodiversity assessments were taken into account in the assessment.

The following information was recorded during the site visit:

1. The condition of the vegetation. Is the vegetation either disturbed or degraded? A

disturbed or degraded area could range from agricultural fields (fallow land), or areas previously disturbed by construction activities, to an area that has been severely eroded or degraded as a result of bad land management or alien infestation.

2. The species diversity. This refers to the numbers of different indigenous plant species occurring on site. Indigenous fauna observed was also noted.
3. Species of Conservation Concern, as well as protected tree species occurring on site. This would include rare, vulnerable, endangered or critically endangered species. Species listed as threatened (if present) were mapped using Easy GPS v2.5 software on an iPhone. Accuracy is given as ±4 m.
4. Identification of the vegetation types and communities (if discernible) on the site. This would include trying to establish the known range of a vegetation type and whether or not it is vulnerable (VU), endangered (EN) or critically endangered (CR).

5 LIMITATIONS TO THE STUDY

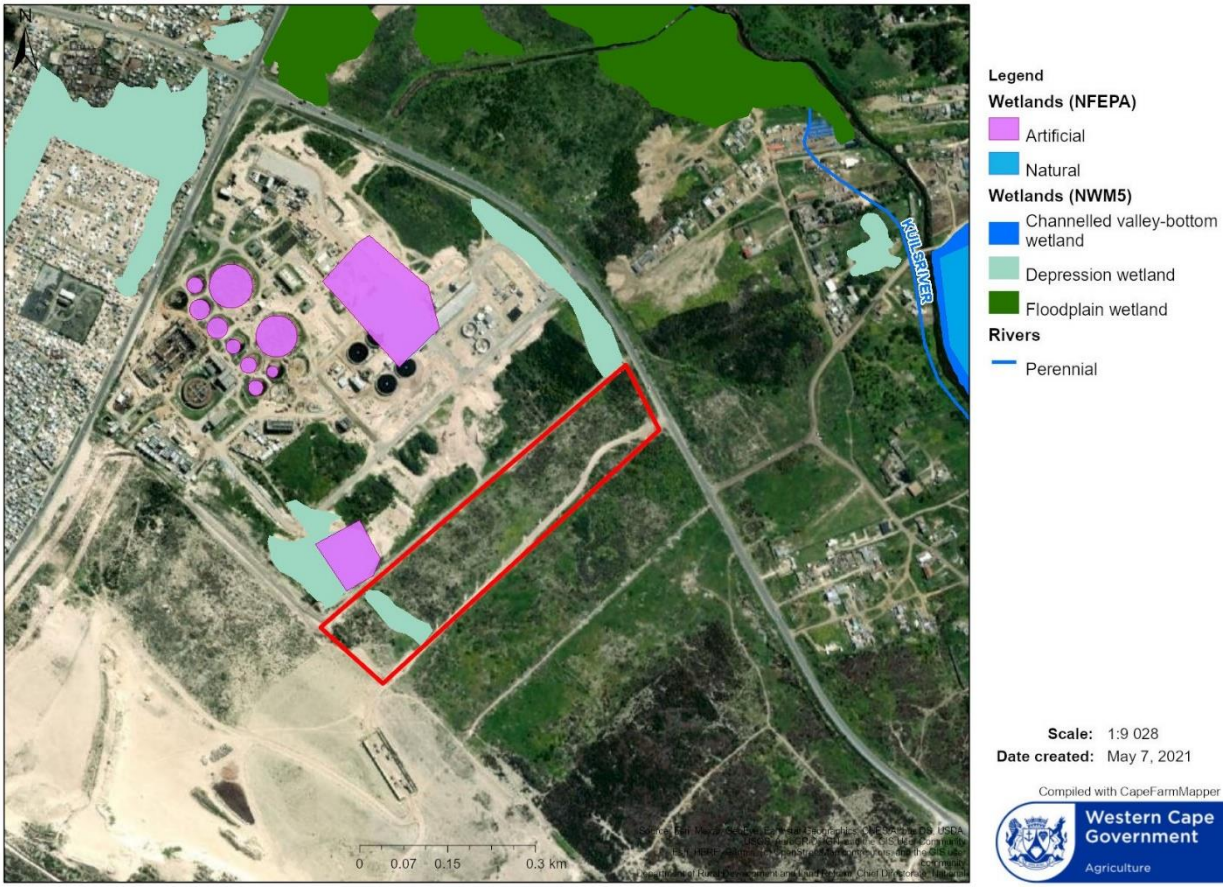
Since fieldwork was carried out in early spring and other times of the year, flowering plants that only flower later in spring, such as certain bulb species (notably from the Iridaceae and Orchidaceae families), may have been missed. The overall confidence in the completeness and accuracy of the botanical findings, given the size and disturbed state of the site, is however considered to be good. A follow-up botanical survey is not deemed essential to inform decision-making.

6 LOCALITY & SITE DESCRIPTION

The site is located on a flat area next to a gravel access road to a sand mine on the northern side of the Macassar dune system (see Map 3). The Zandvliet wastewater treatment works (WWTW) is located close-by to the northwest. The site itself is covered by disturbed strandveld vegetation, with some acacia infestation. Past farming activities, urban development, a large wastewater treatment works and sand mining have transformed much of the surrounding landscape, with only the sand dunes (Macassar dune system) located further away to the south remaining partly untransformed and in a near pristine condition. Although previously part of the above dune system, the site is now largely cut off by extensive sand mining operations. With regards to hydrological features, the site is located close to a few artificial and natural wetlands, including a linear depression wetland[1] that was mapped along a section of Macassar Road (see Map 4). The Kuils River wetlands are located further away to the north and east. There is no clear sign or evidence of a mapped depression wetland in the south-western part of the site.

[1] Van Deventer, H., Smith-Adao, L., Mbona, N., Petersen, C., Skowno, A., Collins, N.B., Grenfell, M., Job, N., Lötter, M., Ollis, D., Scherman, P., Sieben, E. & Snaddon, K. 2018. South African National Biodiversity Assessment 2018: Technical Report. Vol 2a: South African Inventory of Inland Aquatic Ecosystems (SAIIAE). Version 3, final released on 3 Oct 2019. CSIR & SANBI: Pretoria, South Africa.

Map 3 Site proposed for the batching plant.



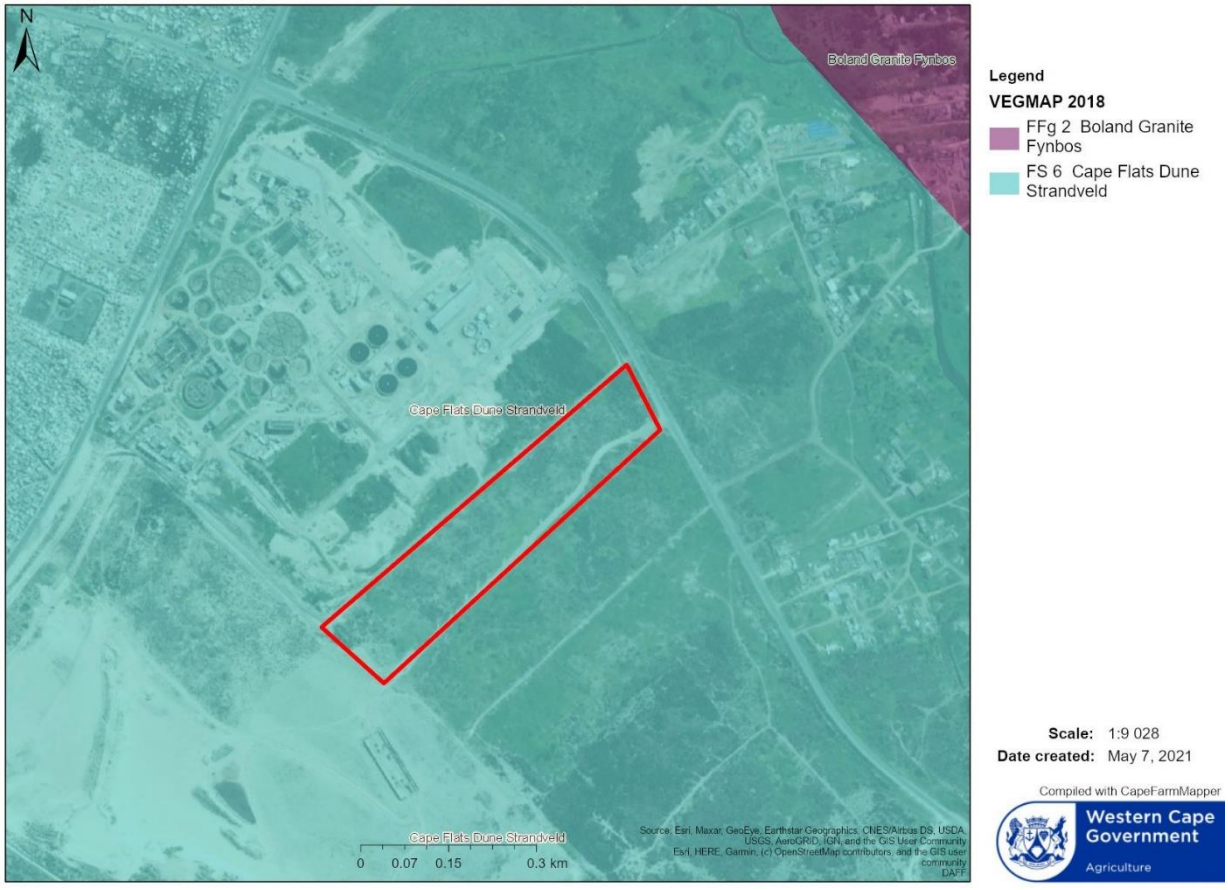
Map 4 Hydrological features map. The site for the proposed batching plant is outlined in red.

The mean annual rainfall for the property, which is located on the Cape Flats, is 526 mm (as per Cape Farm Mapper climatic data for 1950 to 2000). The peak rainfall period are the months of May to August (i.e. unimodal rainfall regime), while the driest period is December to February.

The study site lies clearly in a winter rainfall region. Mean daily maximum and minimum temperatures are 26.5°C and 16.6°C for January/February and July, respectively (as per Cape Farm Mapper climatic data). The Köppen-Geiger climate classification for the Macassar area is Csb. According to the 3318 Cape Town 1:250 000 geological map, the underlying geological formation is identified as Witzand Formation, which is a Quaternary deposit consisting of unconsolidated white sand with comminuted shell, pebbles and shells locally along the beach. Building sand is mined from this formation in the area.

7 BIOGEOGRAPHICAL CONTEXT

Being located on the Cape Flats near the coast, the site occurs in a typical strandveld environment. This is confirmed by the presence of characteristic strandveld species, such as *Otholobium bracteolatum*, *Searsia laevigata* and the dune grass *Ehrharta villosa*. The South African Vegetation Map classifies the vegetation in the area as Cape Flats Dune Strandveld (see Map 5 & Photo 1). The so-called False Bay unit stretches across the Cape Flats from Muizenberg in the west to Gordon's Bay in the east.



Map 5 Extract of the 2018 SA Vegetation Map, showing the site (outlined in red) inside Cape Flats Dune Strandveld.

Photo 1 Fair quality dune strandveld in the southern part of site. Insert: *Otholobium bracteolatum*

8 VEGETATION & FLORA

The vegetation on site, which is slightly undulating due to past sand movement, can be described as degraded strandveld (see Photos 2-4). Structurally, it can be classified as a low mid-dense to closed grassy shrubland following Campbell's (1981) classification. Grasses and small shrub species are dominant, with a few scattered emergent shrub/tree species such as *Acacia cyclops* (rooikrans), *A. saligna* (port jackson), *Senecio halimifolius* and *Osteospermum moniliferum*. The north-eastern end of the site is heavily infested with *Acacia cyclops* (rooikrans) and *A. saligna* (port jackson) and can be described as an acacia thicket.

Indigenous species recorded include *Roepera flexuosa, Tetragonia fruticosa* (dominant), *Carpobrotus edulis, C. acinaciformis, Searsia laevigata, S. glauca, S. lucida, S. crenata, Otholobium bracteolatum* (dominant), *Osteospermum moniliferum, Helichrysum niveum, Nidorella foetida, Senecio littoreus, S. halimifolius*, *S. burchellii, Metalasia muricata, Berkheya rigida*, *Muraltia spinosa, Cliffortia obcordata, Passerina paleacea, Galium tomentosum, Manulea tomentosa* and *Geranium incanum*. Hemicryptophytes and geophytes recorded include *Ehrharta villosa* (dominant), *Stenotaphrum secundatum, Restio eleocharis*, *Zanthedeschia aethiopica, Chasmanthe aethiopica* and *Trachyandra divaricata*. The absence of large-leaved woody species, such as *Olea exasperata*, *Sideroxylon inerme* and *Pterocelastrus tricuspidatus*, indicates that the vegetation is in a pioneer stage due to constant

sand movement or that it was subject to past disturbances. The above-mentioned dynamics of the dune system is progressively being eliminated by adjacent developments (expansion of the Zandvliet WWTW), sand mining activities and alien infestation. Most of the species are pioneer strandveld species, while species diversity is fairly low.

Photo 2 View across the southern part of the site towards the adjacent sand mining operation. Insert: Dune mole (*Bathyergus suillus*) activity

No Species of Conservation Concern (SCC) or protected tree species, such as milkwoods (*Sideroxylon inerme*), were recorded. SCC known or observed by the author and others in the Macassar-Khayelitsha area include *Psoralea repens* (NT), observed on the mining site directly south of the site; *Erepsia dunensis* (EN), recorded 1 km northwest of the site next to Baden Powell Drive, *Jordaaniella anemoniflora* (CR PE), *Cullumia squarrosa* (VU), recorded on exposed calcrete in the Macassar Dunes Conservation Area 2 km southeast of the site, and *Steirodiscus tagetes* (VU), recorded at Swartklip 8 km west of the site. Due to specific habitat requirements, it is unlikely that any of these species may occur on site. *Jordaaniella anemoniflora* was recently sunk under *J. dubia*, a widespread coastal vygie. Its current threat status is therefore questionable. See the online Red List for further details[2].

[2] Threatened Species Programme | SANBI Red List of South African Plants

Photo 3 Disturbed central part of site, with grassy/herbaceous groundcover. Insert: *Muraltia spinosa*

Photo 4 Port jackson infested northern part of site.

A fair number of alien species were recorded, including *Acacia cyclops*, *A. saligna, Spartium junceum, Glebionis coronaria, Myoporum tenuifolium, Euphorbia terracina, Salsola tragus, Chenopodiastrum murale, Echium plantagineum* and *Rapistrum rugosum* (wild mustard) (see Photo 5). Their abundance, especially rooikrans and port jackson, is indicative of past disturbances or agricultural activities. *Acacia cyclops*, *A. saligna*, *Spartium junceum, Myoporum tenuifolium* and *Salsola tragus* are listed invasives in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) Alien and Invasive Species List (2016).

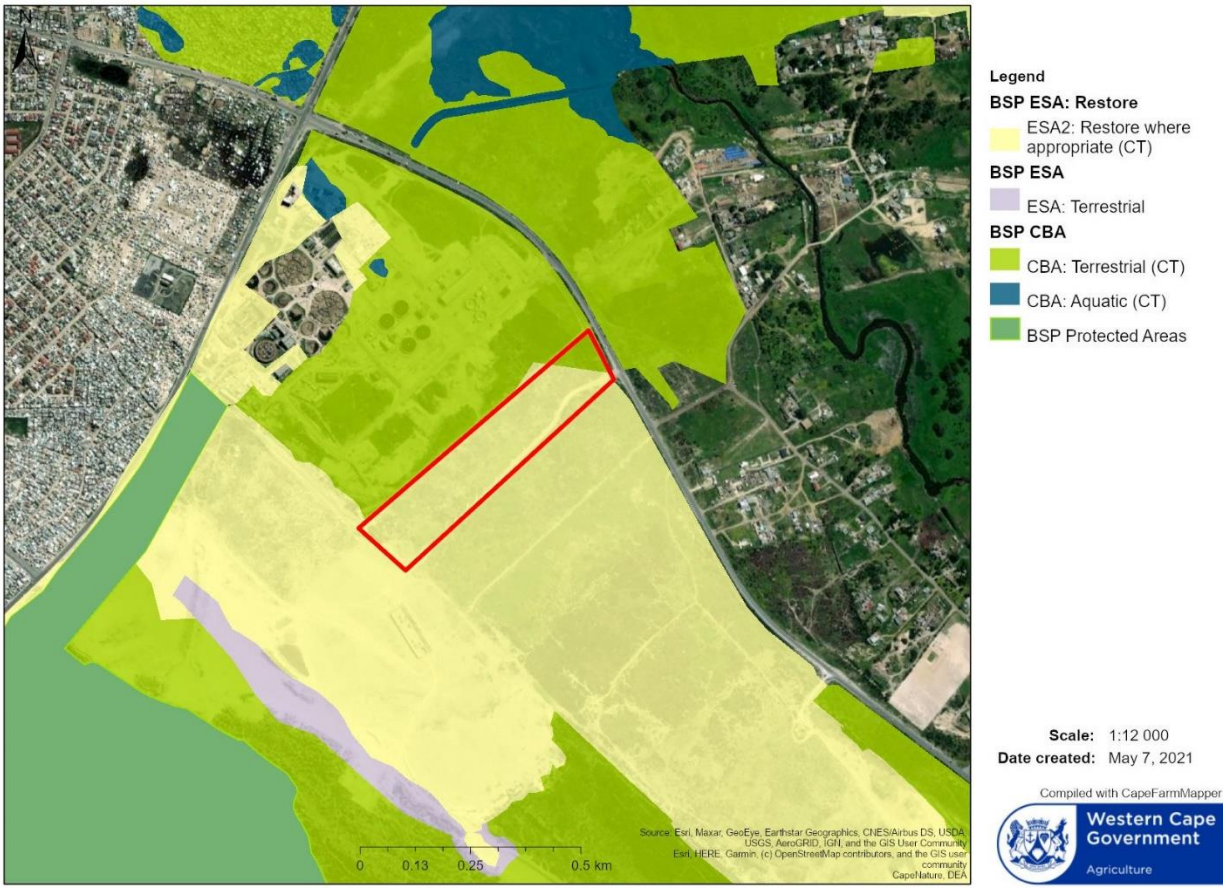
Photo 5 Gall infested port jackson tree. Insert: *Glebionis coronaria*

9 CONSERVATION STATUS & CRITICAL BIODIVERSITY AREAS

Cape Flats Dune Strandveld is highly transformed and listed as Endangered (DEA 2011). This rating was more recently reaffirmed in the Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet *et al.* 2017), as well as in the 2018 South African National Biodiversity Assessment (Skowno *et al.* 2019). Being almost entirely restricted to the City of Cape Town metropolitan area, Cape Flats Dune Strandveld is under severe threat from urban development and sand mining. According to the latest statistics, the remaining habitat of Cape Flats Dune Strandveld has decreased to around 56% in total (Skowno *et al.* 2019) and significantly less for the subtype on the False Bay side of the City (Pat Holmes, former bio-physical specialist at the City of Cape Town pers. comm.). Several housing projects currently underway in the metropolitan area will reduce its habitat even further.

Cape Flats Dune Strandveld is moderately protected. Only about 6% of its original extent is formally conserved, among other, in the Table Mountain National Park, the Wolfgat, Rondevlei and Driftsands Nature Reserves (DEA 2011). As far as the author knows the nearby proposed Macassar Dunes Conservation Area (1116 ha) has not received a formal conservation status yet. With 178 plant species, it contains some of the best remnants of Cape Flats Dune Strandveld[3].

The site falls inside the City of Cape Town Biodiversity Network, and has been mapped as an ecological support area (ESA2: restore where appropriate) (see Map 6). It forms part of the False Bay corridor, which links the Cape Peninsula with the Helderberg area. Along with the sand mine to the south and the Zandvliet WWTW, it also forms part of the Kuils River corridor that links the Macassar dune system in the south with the Driftsands Nature Reserve to the northwest. It is however cut off from the main Macassar dune system by expanding sand mining operations to the south. In the immediate area of the site, an ecological linkage remains around the eastern side, as well to some extent around the western side of the site.



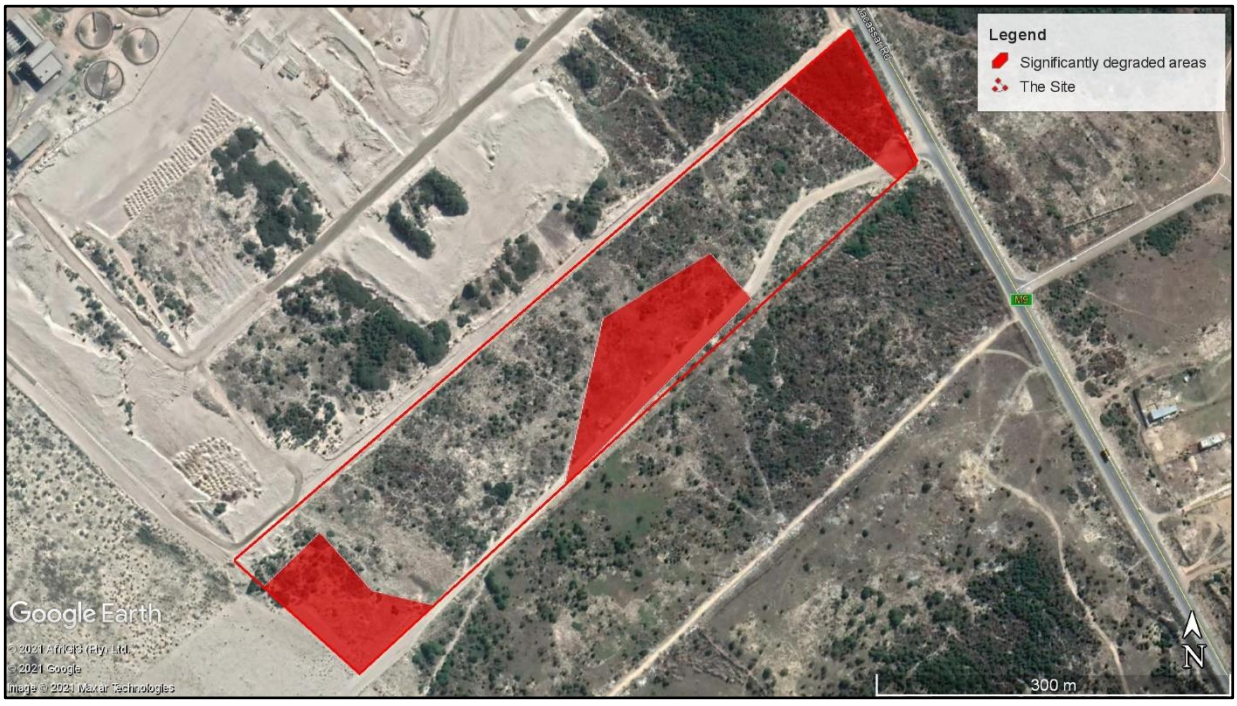
Map 6 Biodiversity network map, with the proposed site outlined in red.

[3] https://www.capetowngreenmap.co.za/cape-town-green-map-online-map/nature/nature-reserve/macassar-dunes-conservation-area

CBA's are areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet *et al.* 2017). These are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Only low-impact, biodiversity-sensitive land uses are considered appropriate. ESA's are not essential for meeting biodiversity targets, but play an important role in supporting the functioning of protected areas and CBA's (Pool-Stanvliet *et al.* 2017). They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and threatened vegetation.

10 IMPACT ASSESSMENT

The site is located in degraded strandveld vegetation, partly infested with invasive acacias and devoid of significant strandveld (scrub) elements. A 'sensitivity' map has been prepared that shows the significantly degraded areas on site (see Map 7). It is recommended that one of these areas be utilised for the proposed batching plan. No known Species of Conservation Concern occur on the site, with all the recorded species considered to be widespread and common. Without mitigation, the impact on Cape Flats Dune Strandveld will be of medium significance at a local level. The surrounding vegetation (irrespective of its condition) should be actively protected during the construction and operational phase of the batching plant. Table 1 below summarises the impact on vegetation type, habitat and species.



Map 7 Significantly degraded areas on site.

Table 1 Impact on vegetation type, habitat and species.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance	Confidence
Without mitigation	Limited to site	Long term	High	High	Low-med (-)	Med-high
With mitigation	Limited to site	Long term	High	High	Low (-)	Med-high
Mitigation measures: Select one of the degraded areas on site for the placement of the batching plant. During the construction and operation of the batching plant, avoid the unnecessary disturbance of the surrounding vegetation by means of fencing; consider search and rescue of indigenous succulent and bulb species for transplanting in adjacent disturbed/degraded area.						

The site forms part of two biodiversity corridors, namely the False Bay corridor and the Kuils River corridor, linking the coastal strip (incl. the Macassar dune system) with the Kuils River and Driftsands Nature Reserve to the north and northwest. The corridor is however severely degraded and under constant pressure from sand mining activities, housing and infrastructure development. The Zandvliet WWTW is also currently being expanded. The batching plant will contribute to the further erosion of the corridor. Rehabilitation of the surrounding area post construction may counter this impact to some extent depending on the environmental goals of the larger area. One can therefore expect a low to medium impact on the functionality of the CBA corridor. The only practical mitigation measures would be to rehabilitate the remainder of the property, encourage the re-establish of strandveld vegetation and to control of invasive aliens as a long-term measure. Table 2 below summarises the impact on the biodiversity network.

Table 2 Impact on the biodiversity network, CBA's, etc.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance	Confidence
Without mitigation	Limited to site	Long term	High	High	Low-med (-)	Med-high
With mitigation	Limited to site	Long term	High	High	Low (-)	Med-high
Mitigation measures: Encourage the re-establishment of strandveld vegetation on the remainder of property; control aliens (especially port jackson and rooikrans) as a long-term management requirement; further development on the property should be discouraged.						

11 CONCLUSION & RECOMMENDATIONS

Overall, the impact of the proposed batching plant on Cape Flats Dune Strandveld (an endangered vegetation type) and the biodiversity network is expected to be of low to medium

significance. The site is located in degraded strandveld, partly infested with invasive acacias and devoid of significant strandveld (scrub) elements. No known Species of Conservation Concern occur on or in close proximity to the site. The site forms part of two biodiversity corridors, namely the False Bay corridor and the Kuils River corridor, linking the coastal strip with the Kuils River and Driftsands Nature Reserve to the north and northwest. The corridor is however severely degraded and under constant pressure from mining activities, housing and infrastructure development. Nevertheless, the batching plant will contribute to the continued erosion of this corridor.

If the project is allowed to proceed, the following mitigation measures should be considered:

- It is recommended that one of the identified degraded areas on site be used for the placement of the batching plan.
- During the construction and operation of the batching plant, avoid the unnecessary disturbance of the surrounding vegetation by means of fencing.
- The batching plant surface should be properly sealed and bunded to prevent soil contamination. If needed, it should also be properly screened to prevent cement dust from settling on the adjacent vegetation.
- Consider search and rescue of indigenous succulent and bulb species prior to construction for transplanting in the adjacent disturbed/degraded area.
- Encourage the re-establishment of strandveld vegetation on the remainder of property and control aliens as a long-term management requirement and discourage further development. Please note that it is a legal requirement for landowners to clear alien vegetation on their land.
- The above should be formalised in an environmental monitoring and audit schedule for the project from inception into the operational phase.

REFERENCES

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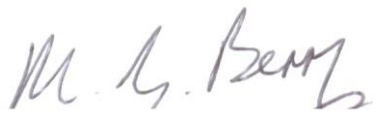
DECLARATION OF INTEREST BY SPECIALIST

I Mark Gerald Berry, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.



Signature of the specialist:

Mark Berry Environmental Consultants cc

Name of company:

10 May 2021

Date:

BRIEF CV OF SPECIALIST

M.G. (Mark) BERRY
ENVIRONMENTAL CONSULTANT & BIODIVERSITY SPECIALIST

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PROFESSIONAL STATEMENT

Environmental assessment professional and biodiversity specialist with over 20 years of experience mainly in the Western Cape Province, but also in the Northern Cape and Eastern Cape. Experience in Environmental Impact Assessments (EIA's), biodiversity assessments, Environmental Management Programmes (EMPr's), Environmental Control Officer (ECO) duties and environmental due diligence investigations.

WORK EXPERIENCE

1989-1990 Nature Conservation Officer in the South African Air Force, based at Langebaan Road Air Force Base

1997-2005 Employed as principal environmental specialist at Planning Partners, a multi-disciplinary consultancy specialising in town and regional planning, environmental planning and landscape architecture. Duties included the conducting of EIA's, compiling EMPr's, ECO duties, biodiversity surveys and status quo environmental assessments for spatial development frameworks.

2000-2006 Examiner for the Board of Control for Landscape Architects (BOCLA), responsible for the setting up and marking of the Environmental Planning Section of exam paper.

2005-current Started Mark Berry Environmental Consultants in June 2005. Responsibilities include office management, seeking tenders, conducting EIA's, compiling EMPr's, construction site environmental audits, biodiversity surveys, etc. A relationship is maintained with previous employer, and, among other, undertook land-use surveys and reporting for the Eskom's site safety reports for three proposed nuclear power plants in the Western and Eastern Cape Provinces.

QUALIFICATIONS

- BSc (1988) University of Stellenbosch
- BSc-Hons in Botany (1991) University of Stellenbosch
- MSc in Botany (1993) Nelson Mandela Metropolitan University
- PhD in Botany (2000) Nelson Mandela Metropolitan University.

PROFESSIONAL MEMBERSHIP

Professional member (reg. no. 400073/98) of the South African Council for Natural Scientific Professions (SACNASP).

REFERENCES

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