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PROPOSED CONSTRUCTION OF A HOUSE AND ANCILLARY BUILDINGS AND INFRASTRUCTURE ON PORTION 134 OF FARM 559 ROOI-ELS

SPECIALIST AQUATIC ECOSYSTEMS IMPACT ASSESSMENT AND DWS RISK REPORT

DRAFT

FEBRUARY 2023

PREPARED BY
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LIZ DAY CONSULTING
Specialist River and Wetland Consultant

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CONSULTING *Specialist River and Wetland Consultant*

8 February 2023

DECLARATION OF SPECIALIST INDEPENDENCE

I, Elizabeth (Liz) Day as a specialist river and river consultant, and Director of Liz Day Consulting (Pty) Ltd (LDC), hereby confirm my independence as a specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which LDC was appointed by PHS Consulting to provide a specialist aquatic ecosystems Baseline Report, Basic Assessment Report and Risk Assessment focused on aquatic ecosystems potentially affected by the proposed development of a house and other buildings and infrastructure on Portion 134 of Farm 559, Rooi-Els, other than fair remuneration for work performed.

Full Name: Dr Elizabeth (Liz) Day
Liz Day Consulting (Pty) Ltd (trading as LDC)
lizday@mweb.co.za

Title / Position: Director

Qualification(s): BA, BSc, BSc Hons, PhD

Experience: > 24 years working on freshwater ecosystems
Relevant work experience: Liz has worked as a freshwater ecologist / aquatic ecosystems specialist for the past +24 years, primarily in the Western Cape, and has produced over 900 technical and Environmental Impact Assessment reports, requiring the assessment of rivers and/or rivers.

With regard to the current project, Liz has worked extensively in the Pringle Bay, Betty's Bay, Hermanus areas, as well as in the broader Kogelberg Biosphere Reserve (Palmiet and Jakkals River catchments). She has experience in river and wetland assessment, rehabilitation and management and has undertaken numerous Risk Assessments (as per DWAF 2016) and wetland delineations.

Registrations: Member of IAIA; Member of WISA; Member of SAWS; Member of SER; Registered Professional Natural Scientist with SACNASP (Reg No 400270/08) for fields of Biological Science, Ecological Science and Zoological Science.

CV provided in Appendix A

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Background

Portion 134 of Farm 559 Rooi-Els ("the site") comprises a largely undeveloped area of land in Rooi-Els, Western Cape. Google Earth imagery shows that a house was constructed in the western portion of the site some time before 2005, and with this came some disturbance, including construction of an access road. Between February and March 2017, a fire through the area resulted in the house burning down and the site was abandoned thereafter.

The new owner of the site wishes to construct a new house on the site, as well as a courtyard, storage and display area for vintage vehicles, and sewage, water and other services.

Since the site includes extensive areas of wetlands and largely undisturbed indigenous vegetation, which could potentially be impacted by the proposed (expanded) re-development, the proposed works would require authorisation in terms of the National Environmental Management Act (NEMA) (Act 107 of 1998) as well as, potentially, the National Water Act (NWA) (Act 36 of 1998).

PHS Consulting was thus appointed by the property owner to oversee the required application processes for authorisation in terms of *inter alia* the NEMA and the NWA. Liz Day Consulting (Pty) Ltd (LDC) was in turn appointed through PHS Consulting to provide specialist input into the application process, from a freshwater ecosystems perspective. LDC is a private, independent consulting company that specialises in river and wetland identification, classification, assessment, management and rehabilitation.

This document was initially presented to the project team as a Baseline Study with preliminary recommendations to guide development planning, from the perspective of aquatic ecosystems. Drawing on these recommendations and several subsequent site visits by the specialist, two alternative development layouts were developed. The present report includes the original Baseline Report and recommendations, as well as a formal assessment of the proposed alternatives, with recommendations for mitigation. It also includes a Risk Assessment of water uses as defined in Section 21c and 21i of the NWA.

1.2 Terms of reference

The terms of reference for this project required that the appointed specialist aquatic ecologist should undertake the following activities / inputs:

- A site visit, to identify and ground truth the [surface] freshwater resources on and associated with the site;
- On the basis of the final development layout, provide a formal Basic Assessment impact assessment report, including recommendations for impact mitigation for both the proposed new dwelling and maintenance activities associated with the dam;
- Identify water uses likely to be associated with the project and outline water use license and/or registration requirements;
- In the event that only Section 21c and i water uses are applicable, include a Risk Assessment Matrix.

1.3 Activities informing this input

This report was informed by:

- A desktop assessment of the study area, with regard to the Western Cape Biodiversity Spatial Plan (Pool-Stanvliet et al 2017), and to historical GOOGLE Earth imagery;
- Liaison with the project botanical specialist (Mr Nick Helme);
- A site visit on 5 October 2021 – this was in mid spring, following the wet season, and

wetlands on the site were still saturated to inundated, with trickle flow onto the site via several watercourses – this was an ideal time to assess aquatic ecosystems on site and to identify drainage sensitivities and issues;

- On-site mapping and assessment of aquatic ecosystems and areas of particular disturbance to aquatic ecosystems;
- Liaison with the project Environmental Assessment Practitioner (EAP) (Mr Paul Slabbert; PHS Consulting);
- An additional two site visits in 2022, to fine-tune the proposed development footprint / find less-impacting footprints on site;
- Consideration of the specialist botanical impact assessment (Helme 2022);
- Compilation of the present document.

1.4 Assessment Methodologies

- Methodologies utilized for the determination of wetland condition, ecological importance and sensitivity and conservation importance are included in Appendices B – D;
- *In situ* water quality measurements were carried out using a HANNA 19811-5 multimeter for pH and Electrical conductivity (EC) measurement in the river channel;
- The protocols used for aquatic ecosystem impact assessment are included in Appendix E.

1.5 Definitions

All references to watercourses in this document are based on the following definitions, as stipulated in the National Water Act (NWA) (Act 36 of 1998), where:

"**watercourse**'' means -

(a) a river or spring;
(b) a natural channel in which water flows regularly or intermittently;
(c) a wetland, lake or dam into which, or from which, water flows; and
(d) any collection of water which the Minister may, by notice in the Gazette, declare to be watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;

"**wetland**" means -

land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

"**Extent of a watercourse**" (as defined in General Notice (GN) 509 of August 2016) means:

(a) The outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam; and
(b) Wetlands and pans: the delineated boundary (outer temporary zone) of any wetland or pan.

1.6 Study area location

Portion 134 of Farm 559 Rooi-Els is a small (24.02 ha) farm located in Rooi-Els, on the eastern side of False Bay in the Western Cape. The property as a whole extends across both sides of the R44 between Rooi-Els and Betty's Bay. However, only a smaller portion was assessed in

the present study, as no works / development is proposed at present for the greater area.

This portion of the site ("the study area") is indicated in **Figure 1.1**. It is accessed off the R44 via a minor road, which splits to lead to a neighbouring property to the south (Portion 46 of Farm 559), and northwards, into the study area.

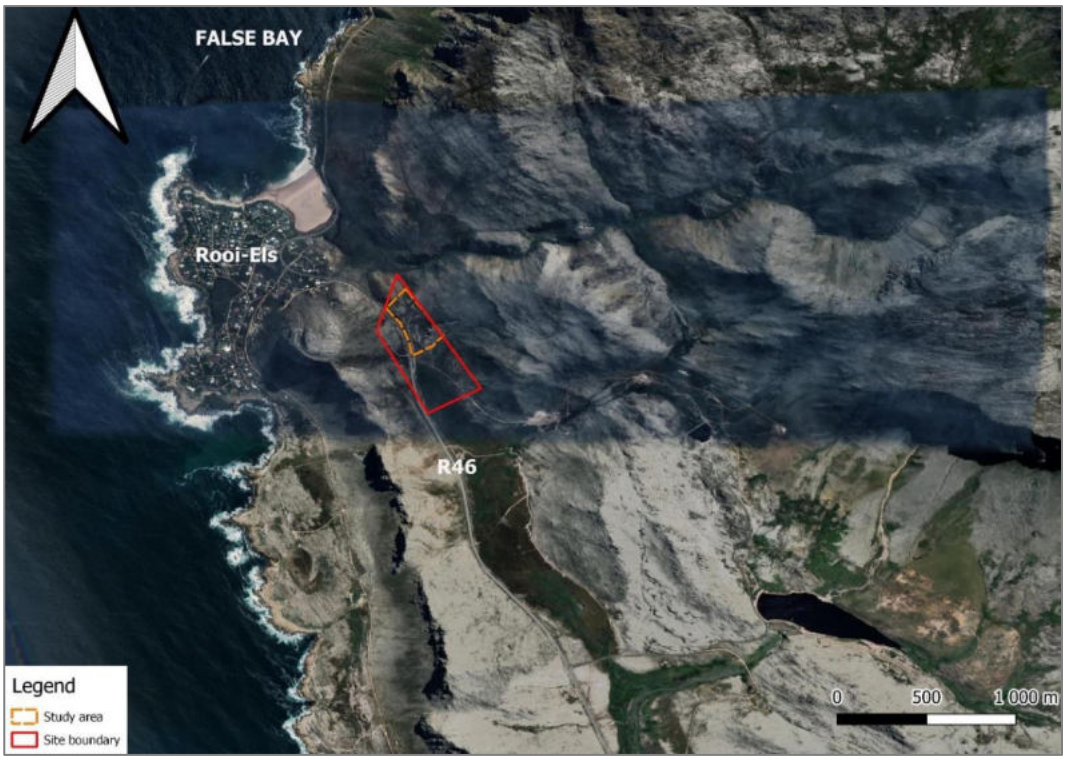

Figure 1.1
Location of Portion 134 of Farm 559 Rooi-Els (red polygon) with the study area marked in orange.

1.7 Assumptions, limitations and uncertainties

- The study focused on the study area indicated in **Figure 1.1** and did not include assessment of the full extent of the site, or physical delineation of the watercourses west of the existing development footprint, as these would not be physically impacted by the proposed development and were relatively inaccessible;
- The aquatic study relied on the botanical assessment of Helme (2021) for the identification of any species of conservation concern in wetland areas;
- Note that accurate identification of the extent of wetlands in some areas was difficult, as a result of the sandy, leached soils and shallow soils on rock. Sandy coastal regions in the Western Cape have been highlighted in Job (2009) as difficult to delineate using soil hydroxymorphic indicators, as such soils are typically low in iron and magnesium and thus often do not form mottles even when exposed to a shallow fluctuating water table. As a result, the delineation of temporary wetlands in this study relied rather on clear bands of saturated surface soils in mid spring (early October), and the presence in places of known obligate wetland plant species. Mapped wetland extent is thus presented with Low to Medium confidence only, although mapped extent in the area likely to be affected by proposed construction is of medium to high confidence;
- Past disturbance in and around the existing housing footprint has disturbed surface and subsurface conditions, altering flow and infiltration patterns in this area.

1.8 Content of the Report in terms of addressing EIA regulations for specialist reporting

In 2020, the National Department of Environmental Affairs (DEA) issued *inter alia* the "*Protocol for the specialist assessment and minimum report contents for environmental impacts on aquatic ecosystems*" (Government Notice 320 of 20 March 2020).

Table 1.1 summarises the reporting requirements listed in the above protocol, and indicates where they are addressed in this report.

Table 1.1
Required Specialist Report contents and locations of items covered in the present document (as per the DEA'S "Protocol for the specialist assessment and minimum report contents for environmental impacts on aquatic ecosystems" (Government Notice 320 of 20 March 2020).

Reference in Protocol	Description	Section in this report where addressed
Section 2	**Site Sensitivity Verification:** Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the Screening Tool must be confirmed by undertaking a Site Sensitivity Verification. Confirmation or rejection of Site Screening Tool findings	Section 2.8
Table 1: Section 1.1	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified on the screening tool as being of: 1.1.1. "very high sensitivity" for aquatic biodiversity, must submit an Aquatic Biodiversity Specialist Assessment; or 1.1.2. "low sensitivity for aquatic biodiversity, must submit an Aquatic Biodiversity Compliance Statement.	This Report N/A
Table 1: Sections 2.1-2.4	**2. Aquatic Biodiversity Specialist Assessment:** Requirements for Aquatic Biodversity Specialist Assessment where there is a confirmed VERY HIGH SENSITIVITY RATING for aquatic biodiversity features: 2.1 The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP), with expertise in the field of aquatic sciences. 2.2. The assessment must be undertaken on the preferred site and within the proposed development footprint. 2.3. The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects: 2.3.1. a description of the aquatic biodiversity and ecosystems on the site, including: (a) aquatic ecosystem types; and (b) presence of aquatic species, and composition of aquatic species communities, their habitat, distribution and movement patterns; 2.3.2. the threat status of the ecosystem and species as identified by the screening; 2.3.3. an indication of the national and provincial priority status of the aquatic ecosystem, including a description of the criteria for the given status (i.e. if the site includes a wetland or a river freshwater ecosystem priority area or subcatchment, a strategic water source area, a priority estuary, whether or not they are free -flowing rivers, wetland clusters, a critical biodiversity or ecologically sensitivity area); and	Page 1 and Appendix A Section 2 and 5 Section 2 Section 2: Section 2.4 Sections 2.1-2.3

	2.3.4. a description of the ecological importance and sensitivity of the aquatic ecosystem including:(a) the description (spatially, if possible) of the ecosystem processes that operate in relation to the aquatic ecosystems on and immediately adjacent to the site (e.g. movement of surface and subsurface water, recharge, discharge, sediment transport, etc.); and (b) the historic ecological condition (reference) as well as present ecological state of rivers (in- stream, riparian and floodplain habitat), wetlands and/or estuaries in terms of possible changes to the channel and flow regime (surface and groundwater). 2.4. The assessment must identify alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification and which were not considered appropriate.	Section 2.7 Section 4 and 5.1
Table 1: Sections 2.5-2.6	2.5 Related to impacts, a detailed assessment of the potential impacts of the proposed development on the following aspects must be undertaken to answer the following questions: 2.5.1 Is the proposed development consistent with maintaining the priority aquatic ecosystem in its current state and according to the stated goal? 2.5.2. is the proposed development consistent with maintaining the resource quality objectives for the aquatic ecosystems present? 2.5.3. how will the proposed development impact on fixed and dynamic ecological processes that operate within or across the site? This must include: (a) impacts on hydrological functioning at a landscape level and across the site which can arise from changes to flood regimes (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes); (b) will the proposed development change the sediment regime of the aquatic ecosystem and its sub -catchment (e.g. sand movement, meandering river mouth or estuary, flooding or sedimentation patterns); (c) what will the extent of the modification in relation to the overall aquatic ecosystem be (e.g. at the source, upstream or downstream portion, in the temporary I seasonal I permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.); and (d) to what extent will the risks associated with water uses and related activities change; 2.5.4. how will the proposed development impact on the functioning of the aquatic feature? This must include: (a) base flows (e.g. too little or too much water in terms of characteristics and requirements of the system); (b) quantity of water including change in the hydrological regime or hydroperiod of the aquatic ecosystem (e.g. seasonal to temporary or permanent; impact of over -abstraction or instream or off stream impoundment of a wetland or river); (c) change in the hydrogeomorphic typing of the aquatic ecosystem (e.g. change from an unchanneled valley- bottom wetland to a channeled valley -bottom wetland); (d) quality of water (e.g. due to increased sediment load, contamination by chemical and/or organic effluent, and/or eutrophication); (e) fragmentation (e.g. road or pipeline crossing a wetland) and loss of ecological connectivity (lateral and longitudinal); and (f) the loss or degradation of all or part of any unique or important features associated with or within the aquatic ecosystem (e.g. waterfalls, springs, oxbow lakes, meandering or braided channels, peat soils, etc.); 2.5.5. how will the proposed development impact on key ecosystems regulating and supporting services especially: (a) flood attenuation; (b) streamflow regulation; (c) sediment trapping; (d) phosphate	Section 5 Table 5.2

	assimilation; (e) nitrate assimilation; (f) toxicant assimilation; (g) erosion control; and (h) carbon storage? 2.5.6. how will the proposed development impact community composition (numbers and density of species) and integrity (condition, viability, predator - prey ratios, dispersal rates, etc.) of the faunal and vegetation communities inhabiting the site? 2.6. In addition to the above, where applicable, impacts to the frequency of estuary mouth, closure should be considered, in relation to: (a) size of the estuary; (b) availability of sediment; (c) wave action in the mouth; (d) protection of the mouth; (e) beach slope; (f) volume of mean annual runoff; and (g) extent of saline intrusion (especially relevant to permanently open systems).	
Table 1: Sections 2.7	The findings of the specialist assessment must be written up in an Aquatic Biodiversity Specialist Assessment Report that contains, as a minimum, the following information: 2.7.1. contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae; 2.7.2. a signed statement of independence by the specialist; 2.7.3. a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment; 2.7.4. the methodology used to undertake the site inspection and the specialist assessment, including equipment and modelling used, where relevant; 2.7.5. a description of the assumptions made, any uncertainties or gaps in knowledge or data; 2.7.6. the location of areas not suitable for development, which are to be avoided during construction and operation, where relevant; 2.7.7. additional environmental impacts expected from the proposed development; 2.7.8. any direct, indirect and cumulative impacts of the proposed development on site; 2.7.9. the degree to which impacts and risks can be mitigated; 2.7.10. the degree to which the impacts and risks can be reversed; 2.7.11. the degree to which the impacts and risks can cause loss of irreplaceable resources; 2.7.12. a suitable construction and operational buffer for the aquatic ecosystem, using the accepted methodologies; 2.7.13. proposed impact management actions and impact management outcomes for inclusion in the Environmental Management Programme (EMPr); 2.7.14. a motivation must be provided if there were development footprints […] that were identified as having a "low" aquatic biodiversity sensitivity and that were not considered appropriate; 2 .7.15. a substantiated statement, based on the findings of the specialist assessment, regarding the acceptability or not of the	Page 1 and Appendix A Page 1 Section 1.3 Appendices B to E and Sections 1.3, and 1.4 Section 1.4 and Section 4 Section 5 (mitigation) Section 5 Section 5.5 Section 5.4 and Table 5.1 N/ A – other than Section 5 construction setbacks Section 5.4 Section 4: lowest impact footprint selected Section 7 and Section 4

	proposed development and if the proposed development should receive approval or not; and 2.7.16. any conditions to which this statement is subjected.	Sections 5.4 and Section 6

2 DESCRIPTION OF AFFECTED AQUATIC ECOSYSTEMS

2.1 Catchment context

The site is located in the Department of Water and Sanitation (DWS)'s Breede-Gouritz Water Management Area (WMA), in quaternary catchment G40B (**Figure 2.1**). The site in fact lies on a watershed between two river catchments (marked as sub-quaternaries in **Figure 2.1**) , with runoff from the northern part of the site forming part of the Rooiels River catchment, while runoff from the south passes into the Buffels River catchment. Both of these are relatively short coastal rivers, with their estuaries at Rooi-Els and Pringle Bay respectively. Both rivers are in a relatively undisturbed condition (Driver at al 2011), in a category A/B (natural to slightly modified from natural).

The site lies in the extensive Kogelberg Biosphere Reserve and its eastern boundary abuts the Kogelberg Nature Reserve.

Helme (2021) notes that soils in the area are acid sands derived from the underlying Table Mountain Group sandstones.

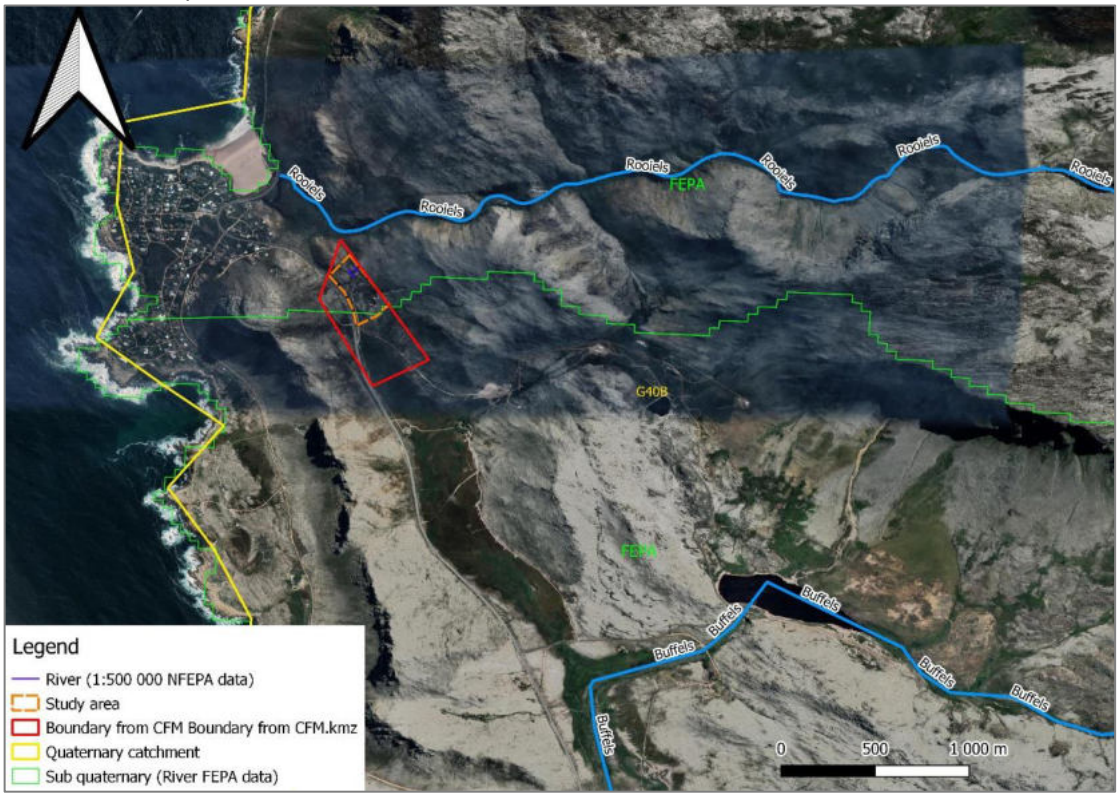

Figure 2.1
Catchment context of Portion 134 of Farm 559

2.2 NFEPA context

Figure 2.1 shows the site and its surrounds in the context of National Freshwater Ecosystem Priority Area (NFEPA) data (after Driver et al 2011). These data rank both the Rooiels and the Buffels River sub quaternaries as River Freshwater ecosystem Priority Areas (FEPAS). Biodiversity conservation plans require River FEPAs to achieve biodiversity targets for river ecosystems and threatened fish species, and were identified in rivers that were (at the time of the NFEPA assessments) in a good condition (A or B ecological category). Their FEPA status indicates that they should remain in a good condition in order to contribute to national biodiversity goals and support sustainable use of water resources.

Although FEPA status applies to the actual river reach within each sub-quaternary catchment thus identified, the whole sub-quaternary catchment is mapped as a FEPA, highlighting the fact that, if biodiversity targets are to be achieved, the surrounding land and smaller stream network need to be managed in a way that maintains the good condition (A or B ecological category) of the river reach.

2.3 Natural vegetation in the study area

Natural vegetation on the site has been identified by SANBI (2006-2018) as Kogelberg Sandstone Fynbos. Helme (2022) notes that this vegetation type is listed as Critically Endangered in the National List of Ecosystems that are Threatened (Government Gazette 2011).

2.4 Identification of Freshwater Bioregions and associated river threat status

The National Biodiversity Assessment (NBA) for aquatic ecosystems (Van Deventer et al 2018) shows that aquatic ecosystems on the site lie within the **Southwest Fynbos bioregion**. **Figure 2.2** presents aquatic ecosystem data from the NBA, which indicates that the southern part of the site includes an extensive floodplain wetland. Southwest Fynbos floodplain wetlands are considered Not Protected and have a threat status of Critically Endangered. NBA data also show a number of seeps immediately south-west of the site. Southwest Fynbos seep wetlands are considered well protected and have a Threat Status of Vulnerable.

It must however be noted that, on the basis of site ground-truthing presented in Section 2.7, there are in fact no floodplain wetlands on the site. All the natural wetlands identified are seep or channeled valley bottom wetlands. The latter have a Threat status of Critically Endangered and are considered Poorly Protected.

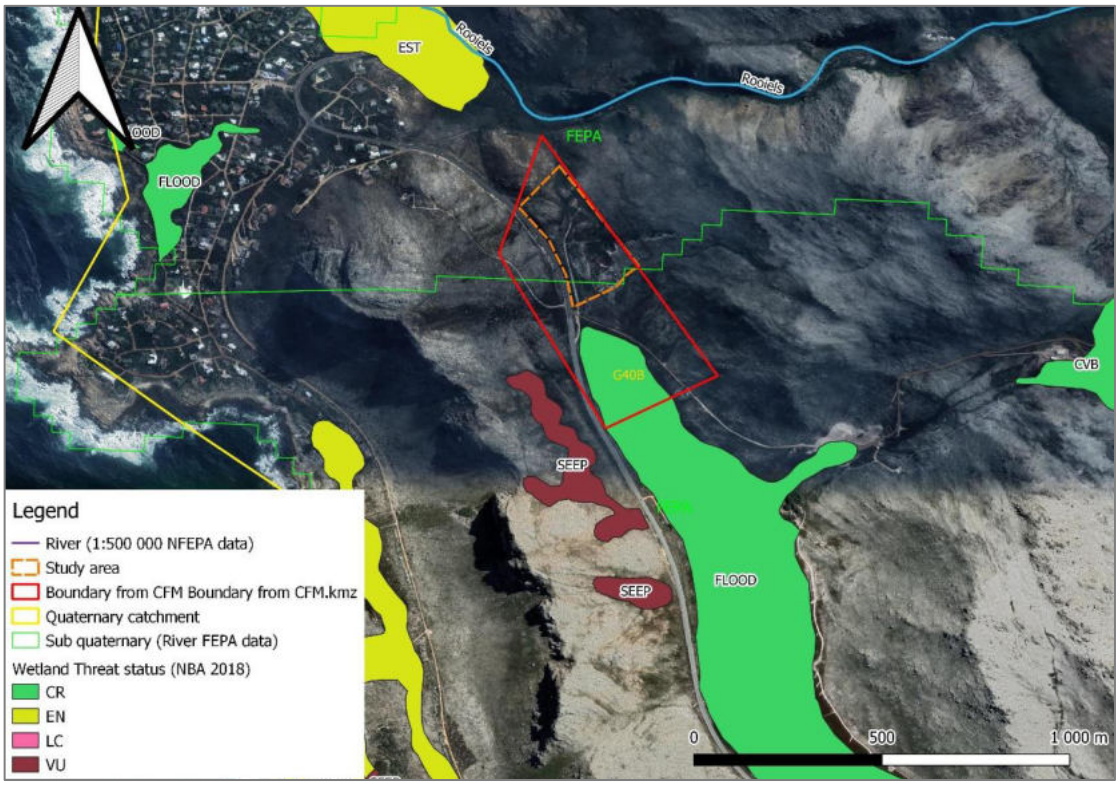

Figure 2.2
Aquatic ecosystems on and abutting the site as mapped in the National Wetland Map (Version 5) of the NBA (Van Deventer et al 2018).

2.5 Context in the Western Cape Biodiversity Spatial Plan

The Western Cape Biodiversity Spatial Plan (WCBSP) of Pool-Stanvliet et al (2017) (see **Figure 2.3**) indicates that:

- The whole site lies in a terrestrial Critical Biodiversity Area (CBA), excluding the R44 road and paved access roads through the site;
- Wetlands identified on the site have been ranked as CBAs – note that as indicated for NBA data, the mapped wetlands are not the same as those identified and mapped during this study, and the map excludes extensive wetland areas in the north of the site.

The implications of these data are that they would tend to magnify the significance of activities that disturb or otherwise degrade these important aquatic ecosystems and their buffers, with buffers needing to be maintained in a good condition so as to protect the adjacent aquatic ecosystem (s).

Figure 2.3
Context of the site in terms of the Western Cape Biodiversity Spatial Plan (WCBSP) of Pool-Stanvliet et al (2017)

2.6 Site and study area overview

The site as a whole extends across both sides of the R44. East of the site boundary, the land slopes steeply up into the near-pristine Kogelberg Nature Reserve. A number of channeled seeps and valley bottom wetlands flow down these slopes and pass into the site.

The study area itself is also largely undeveloped, although it has been subject to past disturbance, comprising:

- A tarred access road (Photo H in **Table 2.1**), which splits just east of the R44, with the northern arm leading into the site and the southern arm leading to Portion 46 of Farm 559 to the south – the remains of this road link back to the R44, but have largely been

grown over in the area north west of the disturbed footprint shown in **Figure 2.4**;

- A berm along the upslope (northern) side of the road leading to Portion 46 of Farm 559;
- A dam, excavated into the hillslope with a low earth wall on the downslope (western) side (Photo C in **Table 2.1**);
- A disturbed area of ground, just north west of the dam (Photo F in **Table 2.1**);
- The site of the former house, now burned to the ground and comprising only the concrete foundations, remnant walls and paving and burned out soakaway / conservancy tank (Photo I in **Table 2.1**).

The locations of these factors are shown in **Figure 2.4**.

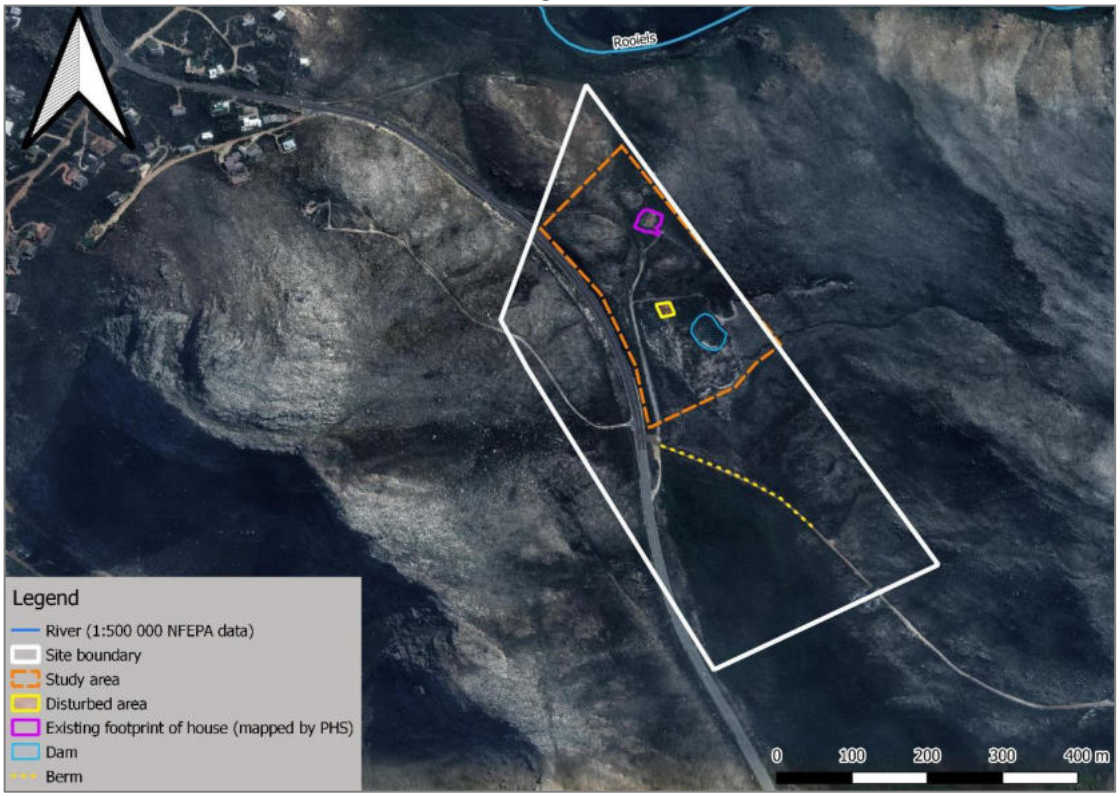

Figure 2.4
Disturbance elements on the site, as mapped in the present assessment

2.7 Description of aquatic ecosystems on and associated with the study area

2.7.1 Overview

This section reflects notes made at the time of the October 2021 site visit.
The key aquatic ecosystems and features described in this section are illustrated photographically **Table 2.1**.

The study area includes two watercourses that flow down from the steep slopes of the Kogelberg Nature Reserve to the east. Of these, the most southerly passes onto the site as a channeled valley bottom wetland, with surface flows at the time of the site visit flowing initially within a slightly incised narrow rocky channel, and then widening out with distance onto the site, to form a wide basin, vegetated with wetland plants including *Berzelia lanuginosa, Psoralea pinnata, Psoralea affinis* and dense bands of *Restio festuciformis* (see A in **Figure 2.5**) (Photo A in **Table 2.1**). It is possible that the wider sections of the wetland have been modified (excavated) by previous landowners at some point, although there was no sign

of excavated material, other than at the existing dam to the north, which itself appears to have been excavated to create a low earth wall on its downslope side. It is thus more likely that the channel widened naturally, possibly as a result of runoff after fire disturbance. Seepage water builds up in the lower wetland against a plug of dense vegetation, including *Berzelia lanuginosa* and *Osteospermum moniliferum*, beyond which it flows in a shallow depression, spreading out and dissipating into a kind of minor alluvial fan in the area to the south (Photo B in **Table 2.1**). A berm has been constructed along the northern (upslope) edge of the access road to the property, and this presumably prevents much of the surface flow accumulating in this area from passing downslope, other than as subsurface seepage. This means that the wetland downslope of the road probably receives less flow than under natural conditions.

The wetland upslope of the "plug" had shallow pooled water at the time of the site visit. As expected in these low-nutrient acid fynbos soils, the water was mildly acidic (pH 5.9) and low in dissolved salts (19.0 EC mS/m). Unidentified tadpoles were observed in the water, and were assumed to be tadpoles of either the common Clicking Stream Frog (*Strongylopus grayii*) or the southern Dainty Frog (*Cacosternum australis*) the presence of both species of which has been confirmed on site (Helme 2021), and both of which were heard calling in the wetland downslope of the dam during the site visit.

The second watercourse enters the site further north as a narrow channeled stream, which spreads out onto the flatter slopes of the site, forming a broad shallow wetland depression, which was saturated at the surface at the time of the site visit (area B in **Figure 2.5**). This broad wetland area is assumed on the basis of its largely terrestrial vegetation community (e.g. dense stands of *Leucondendron xanthoconus* and *Serruria adscendes)* to be temporary wetland, rather than seasonally saturated wetland. Water collecting in this area appears to infiltrate the shallow sands, and feed into temporary seeps that emerge downslope to the north (area E in **Figure 2.5**)and west (area D in **Figure 2.5**), as roughly arrowed in **Figure 2.5,** including into a small dam, with an earth wall that has already been described.

The dam itself was inundated in October 2021 (Photo C in **Table 2.1**), and supported *inter alia* stands of *Phragmites australis*, sparse *Typha capensis, Bolboschoenus maritimus* and *Potamogeton* sp. The area between the upland depression and the dam is disturbed in places, with a road, scattered rubble, a small wooden structure and vegetation associated with disturbance (e.g. *Carpobrotus edulis*) (see Photo D). Buried brickworks in the vicinity of the dam and leading along the road edge upslope of the dam suggest that there might be some subsurface drainage device that conveys seepage water from the upslope seep into the dam, although the extent of such a system was unclear at the time of the site visit.

Downslope of the dam wall, a broad seepage wetland occurs (see area C in **Figure 2.5**), no doubt supported at least in part by seepage from water stored in the dam. At the time of the site visit, this area comprised shallow standing water that supported tadpoles (again assumed to be either Common Clicking Stream Frog (*Strongylopus grayii*) and / or Southern Dainty Frog (*Cacosternum australis*) tadpoles.

This seep gives way (with distance downslope) to a broad temporary wetland seep, which was saturated-to-shallowly-inundated at the time of the site visit, but dominated by non-obligate wetlands plants species such as *Leucondendron xanthoconus* and *Serruria adscendes* (area D in **Figure 2.5** and Photo E in **Table 2.1**). This seep lay just downslope of a disturbed area, in which past infilling of crushed rubble had clearly taken place (Photo F in **Table 2.1**). Wetland conditions, as defined by surface saturation, occurred in low-lying areas adjacent to the disturbed zone. These temporary wetlands area separated by elevated areas, including a low berm along parts of the access road leading to the (now burned out) residence.

Wetland conditions also occur along the access road edge, with wetlands along the western

side of the road clearly being affected by the road itself, which in some areas promotes localized pooling (e.g. in the southern part of the mapped wetland, west of the roadside shown in **Figure 2.5**. This wetland (classified as a wetland seep) flows roughly northwards, as shown in **Figure 2.5**, with surface flows being intercepted by the road, and channeled north east along the road, to discharge into the area north of the road, just upslope of the remnant footprint of the burned-out house on the site (Photos H and I in **Table 2.1**).

Seepage flows from the seep upslope of the dam also appear to daylight on the lower slopes of the hillslope, south of the burned out house, and move as a wide band of temporary wetland (saturated in October 2021), down the slope and across the tar road leading to the (former) house (area E in **Figure 2.5**).

The burned out house was clearly constructed within the seep, and in October 2021, its footprint supported obligate wetland species such as *Ficinia nodosa*, which occurred both on the former development platform (forming artificial perched wetlands on concrete) and around the sides of the development.

Wetland conditions extend on either side of the existing housing platform, with those to the east (area F in **Figure 2.5**) tying in with the upslope seepage wetland (area E in **Figure 2.5**), and that to the west (area G in **Figure 2.5**) being fed by both the latter and from concentrated runoff diverted along the roadside (Photo H in **Table 2.1**). The western seep in fact flows as a channeled (seasonal) seep along the western boundary of the housing platform, within a defined channel, with adjacent obligate wetland plant markers (mainly *Ficinia nodosa*).

Two distinct drainage lines have been mapped west (and downslope) of the existing housing platform. These are clearly defined on site, immediately west of the housing platform, where the slope drops steeply off to the west. *Ficinia nodosa* has established itself around and within the ruined building platform, indicating wetland conditions, including an unnatural perched water table on paved areas.

The area marked as H in **Figure 2.5** comprises a disturbed, infilled area, just west of watercourse G. It is assumed that this infilled and disturbed area was created during construction of the old road, the now-vegetated platform of which lies just south-west of the berm. This old road surface is edged along its western side by near-natural terrestrial vegetation.

Figure 2.5
Aquatic ecosystems on and associated with the site, with assumed sub-surface flow directions through the site shown as blue arrows

Table 2.1
Photographic illustrations of aquatic ecosystems on site

	
Photo A **Upper reaches of wetland A within the site**	**Photo B** **Wetland A downstream of "plug", where water spreads out at times into surrounding area**

	
Photo C **Dam**	**Photo D** **Disturbed area upslope of dam**
	
Photo E **Wetland area B**	**Photo F** **Disturbed area immediately east of area D in Figure 2.5**
	
Photo G **Wetland D along road**	**Photo H** **The road intercepts seepage flows from wetland D and conveys them towards wetland areas G and E**

	
Photo I **Site of former house**	**Photo K** **Wetland immediately north and downslope of former house footprint**

2.7.2 Present ecological state

The Present Ecological States (PES) of aquatic ecosystems described in the previous section of the report and identified in **Figure 2.5** are summarised below, based on the assessment methodologies outlined in Appendix B, and bearing in mind the limitations outlined in Section 1.7:

- Wetland A: PES Category B
- Wetland B: PES Category: A/B
- Wetland C: PES Category B/C
- Wetland D: PES Category C
- Wetland E: PES Category B/C
- Wetland F: PES Category D
- Wetland G: PES Category C
- Dam: Not applicable (artificial habitat).

2.7.3 Ecological importance and sensitivity

Ecological importance and sensitivity is High for all aquatic ecosystems assessed in this report, with the exception of the dam, which is considered of Medium to High sensitivity.

2.8 Site sensitivity

The site includes natural wetlands within and closely abutting the proposed development platform and has thus been assessed, through ground truthing, as of high sensitivity, based on the Site Sensitivity Verification process.

3 GUIDELINES FOR FUTURE DEVELOPMENT

At the time of the Baseline Report, it was understood by specialists involved in the project that the landowner proposed:

- Construction of a storage area for vintage vehicles, with a small residence /flat above the vehicle storage / display area;
- Construction of a new house;
- Inclusion of a sewage conservancy tank;
- A borehole for abstraction of water;
- Periodic dredging of the dam for maintenance purposes.

On the basis of the above, the following recommendations were made, with a view to minimizing impacts to aquatic ecosystems and to inform development planning:

i. The disturbance footprint on the site should ideally not be expanded – in particular, development should not result in further disturbance to wetland areas, noting too that disturbance of any areas on site, terrestrial or aquatic, will have knock-on biodiversity impacts to all systems;

ii. The existing house footprint lies in the middle of a watercourse, and has resulted in changes in the routing of flows past the house. It also lies in an area where it is vulnerable to fire, both coming up the mountainside from the north / north west and coming across the site from the south. The fact that the footprint has already been disturbed means however that its re-use, without further expansion of disturbance area, would be acceptable, subject to the following:

    a. The design of the new building should allow for the spread of shallow subsurface and surface seepage flows immediately downstream of the building platform – a shallow infiltration trench or reverse irrigation drain system might be used in this regard;

    b. The new building should not be expanded beyond the existing built footprint;

    c. The conservancy tank should be located on the southern side of the structure for ease of access and to minimize additional disturbance down the seep to the north;

    d. Existing indigenous vegetation should be retained and the creation of a “garden” / lawn etc. in the wetland seep should not take place;

    e. Raised boardwalks / decks should be used in preference to paving, since the former would allow the passage of seepage water beneath built structures;

    f. Existing rubble and construction waste including the burned out conservancy tank must be removed from site and disposed of at an appropriate location;

    g. Stormwater from the new structure must be managed such that it does not result in concentration of flows but is dissipated as close to source as possible;

iii. If a new house is constructed:

    a. It should ideally be constructed on a disturbed area and outside of any watercourse;

    b. Criteria c to g (above) should be applied;

    c. It should be located such that existing access roads can be used as far as

possible;

d. Its footprint should be minimized;

e. Any new infrastructure (pipelines, cables etc.) should be routed along the existing access roads (preferably within the road footprint), taking care to avoid sensitive areas;

iv. The existing access road should ideally be adapted to allow for the spread of flows downslope, across the road, rather than the diversion of flows to the north east along the road. Thus inclusion of a number of shallow depressions across the road to convey runoff would be recommended – alternatively pipes could be used, although construction of the latter might entail more disturbance along the road edge;

v. Ideally, the dam should not be dredged, as this would result in ongoing disturbance in the area and the need to dispose of dredged material. The dam is also a low-nutrient environment and not prone to the accumulation of large volumes of plant material, and dredging should not be required. In the event that over time vegetation does expand in the dam and require clearing, then the following constraints would apply:

a. Clearing should be carried out using manual labour;

b. It should take place in late summer / autumn, outside of frog and bird breeding periods;

c. Ideally clearing should focus on removal of surface material rather than excavation of rooted material;

d. All plants removed should be transported off site and disposed of at an appropriate waste site.

Note however that management of the dam has not been considered further in this assessment. IN the event that its management through dredging or other impacts that trigger environmental legislation is desired, these activities would require environmental authorisation, probably through the compilation and authorisation of a watercourse Maintenance and Management Plan.

vi. Construction phase input by an Environmental Control Officer (or similar designation) would be a requirement, to ensure that disturbance to sensitive areas is limited.

4 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Two development alternatives have been considered in this assessment. These are described below, and illustrated together in **Figure 4.1**.

Figure 4.1
Proposed Alternative 1 and 2 development layouts.
Alternative 1 development shown as white infilled blocks

4.1 Alternative 1 development layout

This layout was originally suggested by the site developers, for early consideration following submission of the specialist Baseline Reports. It is illustrated in **Figure 4.1** and would comprise:

- Construction of two residential units, one of which would lie mainly on the disturbed footprint of the previous (now burned) unit;
    - The western residential unit would include a (separate) gym, pottery building and triple garage;
    - The eastern unit would connect across wetland seep E via a suspended driveway;
    - The eastern unit would need to apply for building line relaxation from the eastern (Cape Nature) site boundary, in order to lie outside of the seep wetland;
- Construction of a "display lounge" for the storage and display of vintage cars – this would be constructed immediately west of drainage line G, and would straddle the berm along the edge of drainage line G, extending across the scar of the former road, and up and over the terrestrial vegetation west of the road;
- All sewage would be stored in conservancy tanks(one per housing unit and one for the display lounge), to be collected via tanker and conveyed off-site for treatment.

Note however that Alternative 1 was rejected by this specialist at an early stage of development design and planning, on the basis of the following:

- The wide spread of the development requiring board walks or raised driveways across wetland seeps that lie within the Kogelberg Biosphere Reserve and abut the Kogelberg Nature Reserve;
- Significant expansion of the existing development footprint into and abutting important wetland areas;
- The effective fragmentation of the above wetland seeps that would result from the construction of raised drive-ways and walkways to facilitate access across a broad (and relatively unimpacted) seep;
- The additional impacts that would be likely to accrue to affected wetlands, including:
    - Erosion from concentrated stormwater flows;
    - Spread of invasive vegetation across a wide extent of relatively unimpacted wetland;
    - Expanded reach of sewage retrieval vehicles to access multiple sites within least-impacted areas;
    - New development in close proximity to wetland seep G, along the road footprint H (in **Figure 2.5)**.

The above impacts were assessed as of likely **high negative significance** and likely to be associated with a **Medium to High Risk** to aquatic resources. Their further design was not therefore pursued in this project.

4.2 Alternative 2 (currently preferred) development layout

This development layout was developed iteratively between the aquatic specialist and the project team and comprises the following:

- Construction of two residential units between watercourses G and F and within the historical (but permanently altered by past development) seep E (**Figure 2.5**);
- The residential units would include a pottery building and garage – these would be within the existing disturbed area of the previous site;
- The north western corner of the residential unit would overhang a portion of the outer margins of the western part of watercourse G – these are not characterized by obligate wetland vegetation (although facultative wetland vegetation occurs there) but may at times be prone to flood flows. Thus the development plan allows for a raised platform over this area (see **Figure 4.1**), to allow (limited) vegetation growth beneath the platform and, most importantly, free movement of surface and subsurface flows;
- The development footprint shown in **Figure 4.1** would comprise, by agreement with the developer, the full construction phase development footprint;
- The "display lounge" for the storage and display of vintage cars would be located further south of the residential units, within an area that has already been (largely) disturbed by the existing access road, although some overflow into terrestrial vegetation to the west of the road would occur. The display lounge would include:

  - Unspecified guest parking;
  - A conservancy tank for management of sewage waste;
  - An entertaining area;
  - Car parking and workshop areas.

- The existing access road past the display lounge would be utilized for accessing the new residential portion to the north (purple polygon to the north in **Figure 4.1**)
- All sewage would be stored in conservancy tanks, to be conveyed off-site for treatment;
- No details have been provided as to the disposal of grey water (e.g. shower/ bath water).

5 IMPLICATIONS OF THE PROPOSED DEVELOPMENT FOR FRESHWATER ECOSYSTEMS

5.1 General

As already indicated in Section 4.1, the Alternative 1 development, comprising three separate blocks, extending from near to the western (Cape Nature) boundary of the site, westward, and resulting in an extended footprint with several crossings over watercourses (Seep G in particular) was rejected during early stages of project planning.

It would be associated with impacts of high negative significance, at least Medium risks to water resources, and was generally considered inappropriate to the site conditions (from an aquatic ecosystems perspective).

Only Alternative 2 is therefore assessed in this section, using the Methodology outlined in Appendix E. It is shown in relation to mapped watercourses in **Figure 5.1**, for ease of reference.

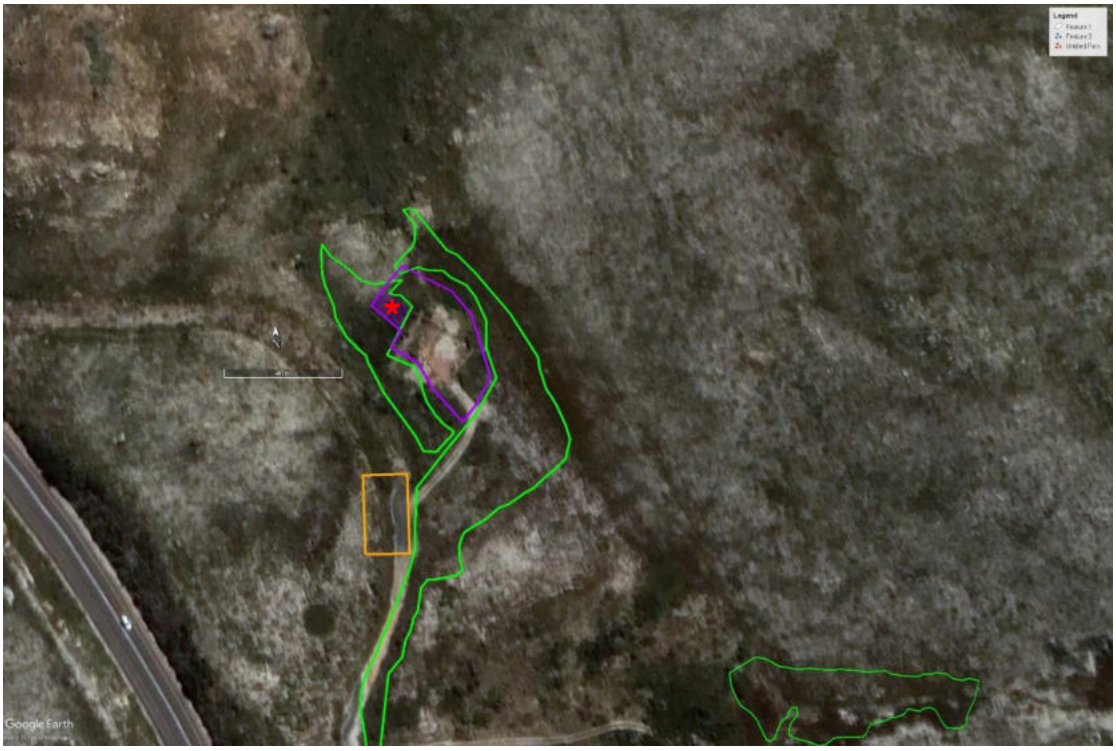

Figure 5.1
Proposed Alternative 2 development layout. Purple polygon shows footprint for two dwellings, garage and other buildings, with asterisked portion comprising a raised platform / deck suspended over the underlying area comprising the upper margins of the watercourse. Orange polygon shows car display area. Wetlands mapped as green polygons based on 2021 delineation.

5.2 Assessment of the no development / maintain *status quo* option

The "no development alternative" in the present case is assumed to allow for existing lawful use of the site, without the need to go through additional authorization processes, including both the NEMA and the NWA. In this case, it is assumed that the following would be allowed:

- Development of a new house on the exact footprint of the old house, with no expansion and no additional facilities;
- Replacement of the burned-out conservancy tank with a new one in the same

position;

- Repair of the existing access road to the house;
- Removal of the remains of the former dwelling (burned concrete etc).

The implications of the NWA for the above "no development" scenario are complicated by the fact that the original house was in fact constructed within the wetland seep, marked in **Figure 2.5** as area E, F and G. Assuming that the construction occurred before 1996 (GOOGLE Earth imagery shows the house had been constructed by at least 2005) and was an "existing (Section 21c and 21i) lawful use" as defined in the NWA (section 32), then like-for-like replacement would be assumed to comply with the NWA. In the event that the previous dwelling was not an existing lawful water use, then authorization in terms of this legislation would be required and the "no development" option would not include re-building of the dwelling.

While the no development option (above) would allow for maintenance of the existing road, it would not allow for the effective diversion of seepage water by the road, upslope of the house, and the resultant droughting of parts of the downslope wetland.

It is assumed that activities such as alien clearing would still need to be carried, as required in terms of the National Environmental Management: Biodiversity Act (NEM:BA) (Act 10 of 2004).

The no development alternative as outlined above would be the preferred outcome for this site, from a freshwater ecosystems perspective. It would however still be likely to contribute to ongoing mild watercourse degradation (permanently altered runoff; mildly polluted runoff from roads and the house surrounds; spread of some non-indigenous propagules into disturbed areas. These impacts would be considered of Very Low negative significance, given that the affected portion of the site is already disturbed, and assuming best practice measures were implemented during construction within a controlled and defined area.

The site would moreover arguably potentially be available for incorporation into wetland offset banks already in place in the valley bottom wetlands to the south of the site.

5.3 Impacts associated with the proposed development

5.3.1 Impacts associated with layout and design

The Alternative 2 layout shown in **Figure 5.1,** which comprises the full construction phase development footprint, is largely (but not wholly) confined to portions of wetland that have already been disturbed by previous development on the site. It does encroach in part into undisturbed terrestrial areas – these have been considered in the specialist botanical report of Helme (2023). The development layout would however result in the following direct impacts to aquatic ecosystems:

- Impacts associated with the residential units and associated infrastructure (purple polygon in **Figure 5.1**):
    - Loss of 20 m^2 of wetland that lies outside of the previous development footprint as a result of direct encroachment of the building footprint beyond the disturbed foundations and building platform of the previous development – this wetland comprises the temporary margins of the east and west "forks" of the wetland seep, and is vegetated by patchy facultative wetland plants (e.g. *Ficinia nodosa*) within a largely terrestrial mosaic, underlain by shallow soils on rock. The affected part of the wetland is already permanently compromised by the existing building platform upslope and its loss is considered acceptable;
    - Degradation of an additional portion of wetland (estimated off GOOGLE Earth

polygons as some 95m^2) on the north western portion of the building (asterisked in **Figure 5.1**) – the building in this area would overhang this part of the wetland and shading would be likely to compromise the integrity of the plant community below. This area comprises the upper, gently sloping temporary portion of the western arm of the adjacent seep;

- General degradation of the seep areas on both sides of the proposed development block – this impact is likely to result from any and all of the following probable issues:
    - The proximity of the proposed building footprint / limited buffer areas between the development footprint and the watercourses, making impact mitigation and dissipation of disturbance difficult;
    - Increased runoff from roofs and other hardened areas(e.g. parking and driveway areas), resulting in concentrated flows into the eastern and western arms of the seep;
    - Increased risk of trampling and disturbance of wetland vegetation in the vicinity of the units, as a result of the proximity of the development to the watercourses;
    - Disturbance of wetlands / watercourses as a result of management of sewage from both the residential and display lounge areas. Sewage would be collected from conservancy tanks, entailing pumping from tanks into so-called "honey sucker" mobile sewage collection tanks. This may result in crushing of vegetation and potential sewage spills during the process, as well as an increased risk of crushing of adjacent vegetation along the access roads to allow heavy vehicle passage and turning during collection periods;

- Impacts associated with the car display lounge and associated parking areas would comprise:
    - Potential further loss of wetland in the area around the display lounge area, in the event that parking areas or an expanded / diverted road accessing both the display area and /or the residential units resulted in any development into the wetland in the area east of the existing road past the proposed footprint;
    - Degradation of wetlands to the east or north east of the display lounge footprint, as a result of:
        - Increased peak flows as a result of increased surface hardening (roof, parking areas, possibly expanded road area, including along the existing road past the footprint leading to the residential units.

The above impacts have been assessed as of Medium negative significance, and would be mitigable to Low negative significance with careful implementation of the mitigation measures outlined in Section 5.4. The assignment of significance ratings takes into account both past disturbance and the "no development" scenario outlined in Section 5.2.

5.3.2 Construction phase impacts

Construction phase impacts potentially pose the greatest risk to aquatic ecosystems in the vicinity of the proposed development platforms and their access roads. While the largely rocky substrate underlying the wetlands and the (at least in the development platforms themselves) means that they are unlikely to be vulnerable to issues such as head cut erosion, severe (albeit localized) degradation of wetlands abutting the development platforms is

however likely as a result of physical and chemical disturbance of watercourses as a result of significant construction activities in close proximity to the watercourses (storage of construction material; stockpiling of waste material (e.g. concrete rubble); movement of construction workers and machinery into the wetlands; blasting of rock to allow founding of new buildings; runoff of contaminated water (sediment and cement inputs)) into adjacent watercourses that do not have adequate ecological buffer areas to mitigate against such impacts.

The above impacts would be most likely to affect wetlands in the vicinity of the residential units and associated infrastructure (purple polygon in **Figure 5.1**). However, similar levels of construction associated disturbance could be associated with construction of the display lounge and associated parking areas and upgrading of the access road.

The above impacts have been assessed as of Medium negative significance, and could be mitigable to Low negative significance with great effort and careful supervision of the implementation of required mitigation measures.

5.3.3 Operational phase impacts

Operational phase impacts associated with the proposed development would include the following:

- Pollution of watercourses resulting in changes in vegetation as a result of an increase in the frequency (seasonally to daily) and quality (low nutrient to high nutrient) of seepage and /or runoff into the watercourses from greywater generated by the development and presumed to be discharged into French Drains or similar;
- Degradation of watercourse condition as a result of changes in natural fire regime (Helme (2023) predicts a likely decrease in fire disturbance frequency compared to natural conditions, which would impact on the condition of plant communities including wetlands, but on a localized scale);
- An increase in alien plant species in the vicinity of the development platforms and along disturbed roads and parking areas – the site is vulnerable to imports of alien plant material both accidentally via vehicles and goods entering the site (mainly seeds) as well as a result of gardening / landscaping of areas with vegetation that is not locally indigenous and/or sourced outside of the study area and thus not genetically intact.

The above impacts have been assessed as of Low to Medium negative significance, since they would generally affect localized areas that have already been compromised by construction activities. These impacts could be mitigated to Low negative significance with effort.

5.4 Recommended mitigation measures

This section outlines the mitigation measures that would be necessary to implement, in order to address the concerns raised in Section 5.2 and 5.3. They are all considered essential unless otherwise specified.

The assessments outlined in **Table 5.1** "with mitigation" assume that mitigation measures are all applied.

5.4.1 Mitigation measures to include in design and layout

i. The existing access road must be used as the most easterly extent of any new construction associated with the proposed display lounge and its parking areas;

ii. The access road to the residential sites may not extend outside of the existing access road footprint;

iii. New services (e.g. cables, pipelines) to the site, if desired, must be routed within the

existing road prism and not as an additional services corridor or footprint;

iv. Runoff from the existing access road must be controlled through sensitive engineering design, undertaken with input from (and sign-off by) a freshwater ecologist, so as to allow for the spread of flows downslope, across the road, rather than the diversion of flows to the north east along the road. This design process might result in a need for shallow swales along the road edge – these should be located within the disturbed road footprint. The new design should not be such that it triggers new erosion or disturbance;

v. Stormwater dissipation measures must be included in architectural and road / parking design to ensure that runoff is dissipated within the total building footprints shown in **Figure 5.1** and the existing access road to pre-construction levels – useful measures could include the use of gravel stormwater dissipation areas or "rain gardens" and the provision of extended detention areas within the disturbance footprints; rainwater tanks also provide some attenuation function, up until the point that they are full;

vi. All greywater sources (from baths, showers, sinks, washing machines etc) must be managed so as to minimize their impact on surrounding natural vegetation. Thus:

   a. Stormwater should not be mixed with greywater as this increases the volume of polluted water to be disposed of;

   b. Grey water may not be used as a source of irrigation water, other than within the disturbance footprint itself, and then subject to the measures outlined in Section 5.4.3 – its use for irrigation of green roofing might be a useful way of disposing of it;

   c. Grey water must be treated before its passage into any soak-away or other disposal system, to remove suspended solids, fats, greases, and, in particular, phosphorus, prior to its disposal – a grey water treatment system must be included in the design and operational management of the site, with the objective of reducing contaminant concentrations in grey water;

   d. Soaps / detergents used on site must be low or zero phosphate products;

   e. All toilets and taps must be fitted with water-saving devices to reduce volumes of waste produced;

   f. Any soak-aways / French Drain type systems that dispose of (treated) grey water into the environment must be located within the development footprints shown in **Figure 5.1**;

vii. The design of any new buildings must allow for the spread of shallow subsurface and surface seepage flows immediately downstream of the building platform – a shallow infiltration trench or reverse irrigation drain system might be used in this regard but must be located within the development footprint only;

viii. Raised boardwalks / decks should be used in preference to paving, since the former would allow the passage of seepage water beneath built structures;

ix. Existing indigenous vegetation abutting the final built structures should be retained as far as possible and the creation of a "garden" / lawn areas in the wetland seeps should not take place;

x. The developed portions of the site including roadways may not be grassed / lawned or vegetated with vegetation that is not locally sourced (propagated from site material) and locally indigenous – non-invasive non indigenous plants may be kept within the identified development footprints, provided that they are controlled in

containers;

xi. The area asterisked in **Figure 5.1** as a raised platform must conform with this approach in final design and construction, and other areas within the building footprint that can be raised rather than being constructed on solid foundations should be sought, with a "tread lightly" approach being strongly recommended;

xii. The conservancy tanks for both the residential units and the display lounge must be located abutting the access road for ease of access and to minimize additional disturbance of wetland seeps;

xiii. The limitations on construction -phase activities outlined in Section 5.4.2 should also be considered in development design, as these have practical implications for design;

xiv. A freshwater ecologist must have sign-off that the final architectural design and layout has considered and responded to the impacts identified in this report, before construction commences.

5.4.2 Mitigation against impacts associated with the Construction Phase

The construction phase poses the greatest risk of impacts to surrounding watercourses and must include the following mitigation measures, aimed mainly at limiting, controlling, and mitigating against identified impacts through the following:

i. A Construction Phase Environmental Management Programme must be compiled and implemented, incorporating:

   a. The appointment of an independent Environmental Control Officer (ECO) (or similar designation), with appropriate experience in managing and minimizing impacts to sensitive ecological systems during construction;

   b. Active input into construction activities, to ensure that ecological impacts are minimized;

   c. Daily visits by the ECO (or similar designation) during construction entailing earthworks and construction up to 1m above ground;

   d. Weekly ECO (or similar designation) visits thereafter;

   e. Initiation of requirements when required for inputs from a freshwater ecologist and/or botanical specialist to address unforeseen or accidental impacts or their required remediation on site;

ii. The disturbance footprint shown in **Figure 5.1** (purple and orange polygons) must be fenced, prior to the start of any construction activities – an additional 3m wide disturbance area may be allowed for the proposed display lounge site, but construction disturbance in the case of the residential units must be confined to the footprint shown in **Figure 5.1**, as agreed in iterative design discussions within the project team – fencing must allow access from the road sides only;

iii. Fencing around the disturbance footprint may be temporary but must nevertheless comprise steel mesh fencing that will indicate a significant barrier to construction workers and contractors – no cement / concrete may be used in installation of fencing;

iv. Areas outside of the fenced areas, excluding the existing road, must be regarded as "no go areas" during construction;

v. The disturbed road surface should be used for stockpiles of construction material and waste;

vi. No blasting of rock may take place – the development footprints need to be based on

a "tread lightly" approach, minimizing their footprints;

vii. Existing rubble and construction waste including the burned out conservancy tank must be removed from site and disposed of at an appropriate (legal) location;

viii. No construction that takes place below 1m above natural ground level and that requires any active excavation, use of cement, concrete, sand, gravel or any other material likely to wash into wetlands abutting construction areas may take place between 1 May and 30 September of any year, to minimize impacts to sensitive areas;

ix. Waste sites; stockpiles; machinery storage areas and all other aspects of construction that require storage space may only be accommodated along the existing road footprint – these areas must be agreed on prior to construction commencement and must be managed by the ECO (or similar) in terms of best practice codes, that include allowance for bunding of refueling areas and management of vehicles and waste;

x. An on-site waste management programme must be implemented that effectively controls the management and disposal waste on the site during construction;

xi. Following completion of construction, the freshwater ecologist must assess the construction sites and outline measures, where necessary, for rehabilitation of disturbed wetland areas, including where necessary requirements for manual or machine re-shaping, manual ripping of compacted areas, and replanting of disturbed zones. Implementation of these measures must be overseen by the ECO (or similar) in collaboration with the freshwater ecologist.

5.4.3 Mitigation against impacts associated with the Operational Phase

Many of the Operational Phase impacts considered in this report have in fact been dealt with already under the mitigation measures to address layout and design related impacts. The following additional mitigation measures do however apply:

i. The site must be maintained free of invasive alien vegetation;

ii. Alien vegetation that is non-invasive (e.g. vegetables; herbs; planted in the development footprints) must be controlled in planters within the authorized development footprints and must be managed such that they do not spread into adjacent terrestrial and wetland areas;

iii. The site as a whole must be maintained free of alien vegetation including kikuyu grass;

iv. Runoff from artificially hardened areas of the site must be managed so as to minimize erosion and polluted runoff into sensitive areas;

v. Expansion of the development footprint into adjacent natural areas may not take place;

vi. No watercourse channelization / wetland drainage may take place, regardless of the proximity of watercourses to the development area;

vii. Fire control measures around built environments must be as outlined in Helme (2023) mitigation measures;

viii. A five yearly audit of the site should be undertaken by a wetland ecologist (ideally from Cape Nature otherwise other independent specialist) funded by the landowner to ensure that the conditions of development authorisation are being implemented.

5.5 Cumulative impacts of the development

The proposed development is relatively small, compared to the size of the property. However, the property itself is one that does not lend itself to the nature of development previously in

place or currently planned, given the sensitivity of watercourses in the area; their low level of current impact, other than where disturbed by previous landowners; and the high likelihood of future fire damage to the planned structures, given their location in a fire-driven ecosystem type. Cumulative impacts of the proposed development are arguably negative, in that it will attract more vehicles and people into the site and pressure for further development into increasingly disturbed natural areas is likely. Although negative, the cumulative impacts of development are however considered of low significance.

5.6 Formal assessment of impacts

Table 5.1 presents the results of application of the formal impact assessment protocols included in Appendix E.

The results show that, assuming adequate implementation of the mitigation measures outlined in this report, the impacts identified could all be reduced to Low levels of negative significance.

No positive impacts for freshwater ecosystems would be associated with the proposed development.

Table 5.1
Results of application of formal impact assessment protocols to identified impacts to aquatic ecosystems predicted as a consequence of potential implementation of the layout and design, as well as the construction and operational phases of the proposed development. Assessment protocols as per Appendix E –numbers assigned as per specified rating scores
Assessments "with mitigation" assume implementation of all measures outlined in Section 5.4.
Note that the impacts assessed here apply to Development Alternative 2 only

	WITHOUT MITIGATION	**WITH MITIGATION**
DESIGN AND LAYOUT PHASE IMPACTS: Impacts associated with the residential units and associated infrastructure		
Impact 1:	***Loss (very small area) or degradation of seepage wetland on and in the vicinity of the building platform***	
Description:	See Section 5.3.1	
Nature of impact	Negative	Negative
Extent of impact	Local	Local
Duration of impact	Long term	Long term
Intensity of impact	Medium	Low
Probability of occurrence	Highly probable	Probable
Significance rating of impact	Medium	Low
Reversibility	Irreversible	
Proposed mitigation measures	See Section 5.4.1	
Impacts associated with the car display lounge and associated parking areas and access road to the residential units		
Impact 2:	***Degradation and possible loss of seepage wetlands in the vicinity of the built areas***	
Description:	See Section 5.3.1	
Nature of impact	Negative	Negative
Extent of impact	Local	Local
Duration of impact	Long term	Long term
Intensity of impact	Medium	Low

	WITHOUT MITIGATION	WITH MITIGATION
Probability of occurrence	Probable	Probable
Significance rating of impact	Medium	Low
Reversibility	Irreversible	
Proposed mitigation measures	See Section 5.4.1	
CONSTRUCTION PHASE IMPACTS		
Impact 3:	***Wetland degradation as a result of construction in their close proximity – potentially affecting indigenous plants; water quality; hydrology; and resulting in damage to plant communities, wetland habitat and potential build-up of solid waste in and near watercourses***	
Description:	See Section 5.3.2	
Nature of impact	Negative	Negative
Extent of impact	Local	Local
Duration of impact	Medium term	Short term
Intensity of impact	Medium	Low
Probability of occurrence	Highly probable	Probable
Significance rating of impact	Medium	Low
Reversibility	Partially reversible	
Proposed mitigation measures	See Section 5.4.2	
OPERATIONAL PHASE IMPACTS		
Impact 4	***Ongoing degradation of seepage wetlands in the vicinity of the built areas as a result of edge impacts***	
Description:	See Section 5.3.3	
Nature of impact	Negative	Negative
Extent of impact	Local	Local
Duration of impact	Long term	Long term
Intensity of impact	Low to medium	Low
Probability of occurrence	Highly probable	Probable
Significance rating of impact	Low to Medium	Low
Reversibility	Partially reversible	
Proposed mitigation measures	See Section 5.4.3.	

5.7 Response to specific requirements of the new NEMA impact assessment protocols

The National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) assessment protocols, as amended, were promulgated in Gazette No. 42451, Government Notice No. 648 of 10 May 2019. These comprised procedures for the Assessment and Minimum Criteria for Reporting of Identified Environmental Themes in terms of Section 24(5)(a) and (h) of the NEMA, when applying for Environmental Authorisation.

Although these issues have been considered indirectly in Sections 2, 3 and Sections 5.1-5.6, this section has been included to address each point raised in the amended assessment protocol specifically, as indicated in **Table 5.2**.

Table 5.2
Response to specific themes raised in the 2020 NEMA specialist reporting protocols (Government Notice No. 648 of 10 May 2019. Procedures for the Assessment and Minimum Criteria for Reporting

of Identified Environmental Themes in terms of Section 24(5)(a) and (h) of the NEMA, when applying for Environmental Authorisation)

NEMA PROTOCOL ISSUE	RESPONSE – note that all responses assume that Mitigation measures have been applied
Is the development consistent with maintaining the priority aquatic ecosystem in its current state and according to the stated goal?	The site lies in the extensive Kogelberg Biosphere Reserve and its eastern boundary abuts the Kogelberg Nature Reserve. It includes South West Fynbos seep wetlands that have a Threat Status of Vulnerable. With full implementation of all mitigation measures, the development could be consistent with the objectives of these conservation plans – however stringent control measures would need to be in place to ensure that these were in fact implemented
Is the development consistent with maintaining the Resource Quality Objectives for the aquatic ecosystems present?	Yes – provided that mitigation measures are fuly implemented
How will the development impact on fixed and dynamic ecological processes that operate within or across the site, including: • Impacts on hydrological functioning at a landscape level and across the site which can arise from changes to flood regimes (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes); and • Change in the sediment regime (e.g. sand movement, meandering river mouth/estuary, changing flooding or sedimentation patterns) of the aquatic ecosystem and its sub-catchment; • The extent of the modification in relation to the overall aquatic ecosystem (i.e. at the source, upstream or downstream portion, in the temporary / seasonal / permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.) • Assessment of the risks associated with water use/s and related activities.	The development should not affect flood attenuation The development should not affect sediment regime Modification of wetlands at a local scale is anticipated – but should be of low significance IF MITIGATION MEASURES ARE IMPLEMENTED – auditing by authorities is required Risk is likely to be Low - IF MITIGATION MEASURES ARE IMPLEMENTED
How will the development impact on the functionality of the aquatic feature, including: • Base flows (e.g. too little/too much water in terms of characteristics and requirements of system); • Quantity of water including change in the hydrological regime or hydroperiod of the aquatic ecosystem (e.g. seasonal to temporary or permanent; impact of over abstraction or instream or off-stream impoundment of a wetland or river) • Change in the hydrogeomorphic typing of the aquatic ecosystem (e.g. change from an unchanneled valley-bottom wetland to a channeled valley-bottom wetland).	Seep base flows unaffected assuming full mitigation implementation Wetland hydroperiod unaffected assuming full mitigation implementation Unaffected assuming full mitigation implementation

• Quality of water (e.g. due to increased sediment load, contamination by chemical and/or organic effluent, and/or eutrophication) • Fragmentation (e.g. road or pipeline crossing a wetland) and loss of ecological connectivity (lateral and Longitudinal) . • The loss or degradation of all or part of any unique or important features (e.g. waterfalls, springs, oxbow lakes, meandering or braided channels, peat soils, etc.) associated with or within the aquatic ecosystem.	Quality of runoff may be impacted – mitigation and control measures may be difficult to implement in practice Unlikely to be impacted to a significant extent – roads are existing and mitigation measures will improve hydrological function and connectivity No unique features.
How will the development impact on key ecosystem regulating and supporting services especially: • Flood attenuation; • Streamflow regulation; • Sediment trapping; • Phosphate assimilation; • Nitrate assimilation • Toxicant assimilation; • Erosion control; and • Carbon storage.	No change in flood attenuation capacity N/A Should be no change assuming stormwater management is implemented Could increase as a result of increased sources of phosphorus / nitrates from greywater systems Erosion from increased stormwater flows to be controlled through stormwater system Probably no change
How will the development impact community composition (numbers and density of species) and integrity (condition, viability, predator-prey ratios, dispersal rates, etc.) of the faunal and vegetation communities inhabiting the site?	Localised change in the community composition or integrity of faunal and floral communities of the ecosystem is envisaged – but this would be limited to the close proximity of the development footprints, assuming mitigation measures are implemented.
In addition to the above, where applicable, impacts to the frequency of estuary mouth closure should be considered in relation to: • Size of the estuary; Availability of sediment; • Wave action in the mouth; • Protection of the mouth; • Beach slope; • Volume of mean annual runoff (MAR); • Extent of saline intrusion (especially relevant to permanently open systems).	N/A
A motivation must be provided if there were development footprints identified as having a "low" biodiversity sensitivity and were not considered appropriate.	The No-Development alternative would have been preferred – this would have entailed rebuilding a like-for-like structure on the footprint of the original structure. The proposed development (Alternative 2) would be acceptable from a freshwater ecosystems perspective but is not preferred.

6 APPLICABILITY OF THE NATIONAL WATER ACT TO THE PROPOSED

ACTIVITIES

The development activities proposed for the site include a number of water "uses", as defined in Section 21 of the National Water Act (NWA) (Act 36 of 1998). As such, they could be subject to requirements for authorisation and/or registration with the Department of Water and Sanitation (DWS).

Section 21 water uses associated with the existing site and / or the proposed development would comprise:

a. taking water from a water resource (possible abstraction from the dam for irrigation purposes – if the mitigation measures outlined in Section 5.4 are applied, then such areas would be very limited in extent;

b. storing water (in the existing dam);

c. impeding or diverting the flow of water in a watercourse (construction on a wetland seep (areas F, G, E or elsewhere, including new roads or pipelines across / through wetlands and addressing existing diversions along the road);

g. disposing of waste in a manner which may detrimentally impact on a water resource (disposal of grey water on site – it is understood that sewage would be taken off site from stored conservancy tanks);

i. altering the bed, banks. course or characteristics of a watercourse (construction on a wetland seep (areas F, G, E or elsewhere, including new roads or pipelines across / through wetlands); edge impacts associated with long-term activities in close proximity to wetland seeps).

Of the above water uses:

- The 21b use would be expected to be relatively minor and would not fall within any thresholds requiring registration of use. The site lies in quaternary catchment G40B. The General Authorisation allowed by GN538 of 2016 for the taking and storing of water is applicable to storage of a maximum storage volume of 10 000 m^3 on any one property. The existing dam on the property has an estimated maximum surface area (plotted off GOOGLE Earth imagery) of 1200 m^2. Conservatively assuming an average depth of 1.5m across the dam, the resultant volume would be 1 800 m^3. This use would not require registration with the DWS – it is noted that the dam is existing;
- The 21a water use would not be covered by the above GA as it would occur within 500 m of a wetland, which is an exclusion to the taking of water from a water resource. Abstraction could take place if for non-commercial purposes, in terms of Schedule 1 of the NWA, which defines "Permissible Use of Water" and allows *inter alia* for abstraction for reasonable domestic use and small (non-commercial) gardening;
- The 21c and i uses could be managed so as to minimise impacts (assessed already in Section 5 as mitigable to Low Significance impacts) and would thus be Generally Authorised in terms of Government Notice (GN) 509 of August 2016, which allows for the General Authorisation of Section 21c and i activities that are assessed as of Low Risk. **Table 6.1** presents the results of the required Risk Assessment for consideration of Section 21c and 21i water use activities[1]. **It confirms that the Section 21c and 21i water uses associated with the proposed project would, if adequately controlled as**

[1] Note that the Risk Matrix in its current form does not easily (or defendably) apply to the Layout and Construction Phase activities assessed here, and ratings of Activity and Impact frequency have been adjusted to make more sense of the kind of impacts considered.

per the specified mitigation measures listed in Section 5.4 and repeated in the table, result in Low Risks to aquatic ecosystems.

- The above notwithstanding, exclusions to the applicability of GN509 include the following:
    - Instances where an application must be made for a water use license for the authorisation of any other water use as defined in section 21 of the Act that may be associated with a new activity;
    - Where storage of water results from the impeding or diverting of flow or altering the bed, banks, course or characteristics of a watercourse; and
    - Any water use in terms of section 21(c) or (i) of the Act associated with construction, installation or maintenance of any sewerage pipelines, pipelines carrying hazardous materials and to raw water and wastewater treatment works.

  The requirement for construction of two conservancy tanks on the site within the "regulated area of a watercourse" (i.e. for a residence on the existing platform) would thus be an exclusion to GN509, and could require licensing. This should be discussed with DWS licensing officials – it is however clear that individual conservancy tanks are not generally required to be licensed in terms of the NWA.

Table 6.1

Aspects and Impact Register/Risk Asssessment for Section 21c and i activities associated with the proposed development of Portion 134 of Farm 559 Rooiels
Assessment assumes fulll implementation of control measures listed (as per Section 5.4).
Risk Matrix completed by Liz Day -SACNASP Reg no. 400270/08

Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph+Vegetation)	Biota	Severity	Spatial scale	Duration	Conseq.	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Signif.	Risk Rating	Control Measures	Watercourse Type
Construction and Design	Construction on and in close proximity to wetland seeps these seeps have in part already been impacted by previous development	Construction within development platforms in close proximity to identified wetland seeps at the upland end of a watercourse in a sensitive area abutting a conservation area (Kogelberg Nature Reserve) within the Kogelberg Biosphere Reserve)	Wetland degradation and loss	1	2	2	1	1.5	1	2	4.5	1	5	5	1	12	54	L	i. The existing access road must be used as the most easterly extent of any new construction associated with the proposed display lounge and its parking areas; ii. The access road to the residential sites may not extend outside of the existing access road footprint; iii. New services (e.g. cables, pipelines) to the site, if desired, must be routed within the existing road prism and not as an additional services corridor or footprint; iv. Runoff from the existing access road must be controlled through sensitive engineering design, undertaken with input from (and sign-off by) a freshwater ecologist, so as to allow for the spread of flows downslope, across the road, rather than the diversion of flows to the north east along the road. This design process might result in a need for shallow swales along the road edge – these should be located within the disturbed road footprint. The new design should not be such that it triggers new erosion or disturbance; v.Stormwater dissipation measures must be included in architectural and road / parking design to ensure that runoff is dissipated within the total building footprints shown in Figure 5.1 and the existing access road to pre-construction levels – useful measures could include the use of gravel stormwater dissipation areas or "rain gardens" and the provision of extended detention areas within the disturbance footprints; rainwater tanks also provide some attenuation function, up until the point that they are full; vi. All greywater sources (from baths, showers, sinks, washing machines etc) must be managed so as to minimize their impact on surrounding natural vegetation. Thus: a.Stormwater should not be mixed with greywater as this increases the volume of polluted water to be disposed of; b. Grey water may not be used as a source of irrigation water, other than within the disturbance footprint itself, and then subject to the measures outlined in Section 5.4.3 – its use for irrigation of green roofing might be a useful way of disposing of it; c. Grey water must be treated before its passage into any soak-away or other disposal system, to remove suspended solids, fats, greases, and, in particular, phosphorus, prior to its disposal – a grey water treatment system must be included in the design and operational management of the site, with the objective of reducing contaminant concentrations in grey water to as close to natural background conditions on the site as possible; d. Soaps / detergents used on site must be low or zero phosphate products; e. All toilets and taps must be fitted with water-saving devices to reduce volumes of waste produced; f. Any soak-aways / French Drain type systems that dispose of (treated) grey water into the environment must be located within the development footprints shown in Figure 5.1; vii. The design of any new buildings must allow for the spread of shallow subsurface and surface seepage flows immediately downstream of the building platform – a shallow infiltration trench or reverse irrigation drain system might be used in this regard but must be located within the development footprint only; viii.Raised boardwalks / decks should be used in preference to paving, since the former would allow the passage of seepage water beneath built structures; ix. Existing indigenous vegetation abutting the final built structures should be retained as far as possible and the creation of a "garden" / lawn areas in the wetland seeps should not take place; x. The developed portions of the site including roadways may not be grassed / lawned or vegetated with vegetation that is not locally sourced (propagated from site material) and locally indigenous – non-invasive non indigenous plants may be kept within the identified development footprints, provided that they are controlled in containers; xi. The area asterisked in Figure 5.1 as a raised platform must conform with this approach in final design and construction, and other areas within the building footprint that can be raised rather than being constructed on solid foundations should be sought, with a "tread lightly" approach being strongly recommended; xii. The conservancy tanks for both the residential units and the display lounge must be located abutting the access road for ease of access and to minimize additional disturbance of wetland seeps; xiii. The limitations on construction -phase activities outlined in Section 5.4.2 should also be considered in development design, as these have practical implications for design; xiv. A freshwater ecologist must have sign-off that the final architectural design and layout has considered and responded to the impacts identified in this report, before construction commences; xv. A Construction Phase Environmental Management Programme must be compiled and implemented, incorporating: a. The appointment of an independent Environmental Control Officer (ECO) (or similar designation), with appropriate experience in managing and minimizing impacts to sensitive ecological systems during construction; b.Active input into construction activities, to ensure that ecological impacts are minimized; c. Daily visits by the ECO (or similar designation) during construction entailing earthworks and construction up to 1m above ground; d. Weekly ECO (or similar designation) visits thereafter; e. Initiation of requirements when required for inputs from a freshwater ecologist and/or botanical specialist to address unforeseen or accidental impacts or their required remediation on site; xvi. The disturbance footprint shown in Figure 5.1 (purple and orange polygons) must be fenced, prior to the start of any construction activities – an additional 3m wide disturbance area may be allowed for the proposed display lounge site, but construction disturbance in the case of the residential units must be confined to the footprint shown in Figure 5.1, as agreed in iterative design discussions within the project team – fencing must allow access from the road sides only; xvii. Fencing around the disturbance footprint may be temporary but must nevertheless comprise steel mesh fencing that will indicate a significant barrier to construction workers and contractors – no cement / concrete may be used in installation of fencing; xviii. Areas outside of the fenced areas, excluding the existing road, must be regarded as "no go areas" during construction; xix. The disturbed road surface should be used for stockpiles of construction material and waste; xx. No blasting of rock may take place – the development footprints need to be based on a "tread lightly" approach, minimizing their footprints; xxi. Existing rubble and construction waste including the burned out conservancy tank must be removed from site and disposed of at an appropriate (legal) location; xxii. No construction that takes place below 1m above natural ground level and that requires any active excavation, use of cement, concrete, sand, gravel or any other material likely to wash into wetlands abutting construction areas may take place between 1 May and 30 September of any year, to minimize impacts to sensitive areas; xxiii. Waste sites; stockpiles; machinery storage areas and all other aspects of construction that require storage space may only be accommodated along the existing road footprint – these areas must be agreed on prior to construction commencement and must be managed by the ECO (or similar) in terms of best practice codes, that include allowance for bunding of refueling areas and management of vehicles and waste; xxiv. An on-site waste management programme must be implemented that effectively controls the management and disposal waste on the site during construction; xxv. Following completion of construction, the freshwater ecologist must assess the construction sites and outline me+AC7asures, where necessary, for rehabilitation of disturbed wetland areas, including where necessary requirements for manual or machine re-shaping, manual ripping of compacted areas, and replanting of disturbed zones. Implementation of these measures must be overseen by the ECO (or similar) in collaboration with the freshwater ecologist.	Unchanneled seep wetlands
Operational Phase	Operational phase of residential units and vehicle display lounge (requiring parking and assembly of guests and vehicles) closely abutting sensitive seep wetlands	Ongoing degradation of seepage wetlands in the vicinity of built areas inlcuding the access road as a result of edge impacts (stormwater; greywater; plant invasion; trampling and disturbance of natural areas etc)	Ongoing (but localised) wetland degradation	1	2	2	1	1.5	1	2	4.5	3	3	5	1	12	54	L	i. The site must be maintained free of invasive alien vegetation; ii. Alien vegetation that is non-invasive (e.g. vegetables; herbs; planted in the development footprints) must be controlled in planters within the authorized development footprints and must be managed such that they do not spread into adjacent terrestrial and wetland areas; iii.The site as a whole must be maintained free of alien vegetation including kikuyu grass; iv. Runoff from artificially hardened areas of the site must be managed so as to minimize erosion and polluted runoff into sensitive areas; v.Expansion of the development footprint into adjacent natural areas may not take place; vi. No watercourse channelization / wetland drainage may take place, regardless of the proximity of watercourses to the development area; vii. Fire control measures around built environments may not include any excavation below ground level and may not expand beyond 5m width from any authorized building edge – low growing vegetation must be maintained in fire breaks to prevent erosion along these areas; viii. A five yearly audit of the site should be undertaken by a wetland ecologist (ideally from Cape Nature otherwise other independent specialist) funded by the landowner to ensure that the conditions of development authorisation are being implemented.	

7 CONCLUSIONS

This report has provided a baseline description of aquatic ecosystems on the site, and assessed the likely impacts of the proposed development on these systems. Ideally, no further development of the site should take place, and the site is moreover ideally placed to form part of the potential wetland offset receptor sites currently being targeted by the City of Cape Town in that area.

However, that said, the impacts to aquatic ecosystems that would be associated with **the Alternative 2 development** considered in this assessment would be mitigable to low levels of negative significance, and implementation of this development alternative **would be considered acceptable from a freshwater ecosystems perspective**, provided that implementation of mitigation measures is stringently applied; auditing of operational phase activities is carried out; and appropriate correctional responses to the results of auditing are applied as necessary.

The Alternative 1 development layout is considered neither appropriate to the site nor mitigable to acceptable levels of risk to aquatic ecosystems. This alternative was not therefore considered in detail in this assessment and would not be an ecologically acceptable development to pursue or authorize.

The proposed Alternative 2 development has been assessed as of Low Risk, using the DWS Risk Assessment Matrix – however, DWS officials would need to be engaged with by the project team to determine the applicability of GN509 to this development.

It is recommended that GN509 be considered applicable.

8 REFERENCES

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APPENDIX A

SPECIALIST CURRICULUM VITAE

LIZ DAY'S CURRICULUM VITAE

SUMMARY DOCUMENT (2023)

Name	Dr Elizabeth (Liz) Day (née Reynolds)
Address	6 Flamingo Crescent, Zeekoevlei, 7941, Cape Town, South Africa
Cell number	083 454 2309
Email	liz@lizdayconsulting.co.za
Date of birth	3 May 1968
Place of birth	Zimbabwe
Nationality	South African
Current Position	Director: Liz Day Consulting (Pty) Ltd

Liz Day is a **Freshwater Ecologist** who provides specialist input into river and wetland ecosystems management and rehabilitation, water quality, baseline assessments, impact assessments, wetland offset determinations, strategic planning and review and other aspects of aquatic ecosystem consulting. She has particular experience in working in urban and agricultural areas, across a wide range of socio economic conditions.

KEY WORK EXPERIENCE

2019 -	Specialist consultant on freshwater ecosystems (rivers and wetlands) – Liz Day Consulting (Pty) Ltd
1999- 2019	Specialist consultant on freshwater ecosystems; co-founder of Freshwater Consulting (FCG)
1997 - 1999	Senior Consultant for Southern Waters Ecological Research and Consulting cc
1994 - 1996	Scientific Officer on Water Research Commission Project, Freshwater Research Unit, UCT.

SUMMARY OF RELEVANT EXPERIENCE

> 24 years' experience in aspects of aquatic ecology, specialising in:

- Water quality wetland, river, wetland and vlei water quality monitoring, data analysis and interpretation as well as urban stormwater quality assessments
- Urban river and wetland management and rehabilitation
- Urban stormwater design with respect to freshwater ecosystems and water quality amelioration
- Specialist input into environmental impact assessments; baseline and situation assessments
- DWS Risk Assessments;
- Wetland Offset calculations and agreements;
- Catchment and River Management Plans
- River corridor plans
- Inputs into Ecological Reserve Determinations
- River and wetland Maintenance and Management Plans
- River and wetland mapping and biodiversity planning
- Wetland delineation
- SASS5 bioassessments.

Liz has compiled over 900 specialist riverine ecology technical reports, 12 scientific papers (6 in international literature); 20 popular biological articles published in local environmental magazines, scripts for several environmental documentaries; *ad hoc* lecturer in freshwater ecology at UCT; co-author on 4 Water Research Commission reports; lead author on chapter in UNESCO Sustainable Management of Urban Aquatic Ecosystems handbook; lead author on chapter in Fynbos Ecosystem Management book; project leader and author of WRC Technical Manual for River Rehabilitation in South Africa (2016). She has also sat on the Reference Groups / Steering Committees of numerous Water Research projects, including those relating to wetland ecological infrastructure, wetland rehabilitation monitoring protocols, Sustainable Urban Drainage Systems (SUDS) and Water Sensitive Urban Design (WSUD) in the City of Cape Town and eThekwini Municipalities.

KEY QUALIFICATIONS

- Bachelor of Arts (English), University of Cape Town, 1989
- Bachelor of Science (Zoology and Environmental and Geographical Science); University of Cape Town; 1992
- Bachelor of Science (honours- Zoology, first class); University of Cape Town, 1993
- PhD (Zoology / Marine Biology); University of Cape Town, 1998

PROFESSIONAL AFFILIATIONS

- Member of WISA, IAIA-SA and Society for Ecological Restoration (SER) (African Chapter)
- Registered Professional Natural Scientist by SACNASP (Reg No 400270/08)
- Member of Western Cape Wetlands Forum and Wetland Society of South Africa
- Member of False Bay Nature Reserve Protected Area Advisory Committee
- Member – Mayoral Advisory Committee on Water Quality in Wetlands and Waterways.

APPENDIX B

Methodology for determining wetland condition

B Wetland condition

Wetland condition was assessed using the desk-top Present Ecological State (PES) methodology, adapted from DWAF (1999). The methodology is based on a comparison of current attributes of the wetland, which are scored against those of a desired baseline or reference condition, resulting in the assignment of a wetland to one of six PES categories, as defined in DWAF (1999) and described in Table B1. The methodology is applicable to natural wetlands only.

Table B1
Present Ecological State (PES) categories showing deviation from natural conditions (adapted from DWAF 1999)

CATEGORY	DESCRIPTION	SCORE (% OF TOTAL)
A	Unmodified, natural.	90-100
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	80-90
C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.	60-79
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.	40-59
E	The loss of natural habitat, biota and basic ecosystem functions is extensive.	20-39
F	Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances, the basic ecosystem functions have been destroyed and the changes are irreversible.	0

APPENDIX C

Methodology for determining the Ecological Importance and Sensitivity (EIS) of wetlands

C. Ecological Importance and Sensitivity (EIS) protocol for wetlands

The method used to assess the EIS of wetlands is a refinement of the Resource Directed Measures for Water Resources: Wetland Ecosystems method (DWAF 1999). It includes an assessment of ecological (e.g. presence of rare and endangered fauna / flora), functional (e.g. groundwater storage / recharge) and socio-economic criteria (e.g. human use of the wetland).

Scoring of these criteria places the wetland in a Wetland Importance Class (A-D) (see Table C1).

Table C1
Wetland Importance Class integrating Ecological Importance and Sensitivity, and functional and socio-cultural importance modifiers

Importance class (one or more attributes may apply)	Range of Median	Wetland Importance Class
Very high Representative of wetlands that: • support key populations of rare or endangered species; • have a high level of habitat and species richness; • have a high degree of taxonomic uniqueness and/or intolerant taxa; • provide unique habitat (e.g. salt marsh or ephemeral pan; physiognomic features, spawning or nursery environments); • is a crucial avifaunal migratory node (e.g. RAMSAR wetlands); • may provide hydraulic buffering and sediment retention for large to major rivers that originate largely outside of urban conurbations; • have groundwater recharge/discharge comprising a major component of the hydrological regime of the wetland; • are highly sensitive to changes in hydrology, patterns of inundation, discharge rates, water quality and/or disturbance; and • are of extreme importance for conservation, research or education.	>3 <=4	A
High Representative of wetlands that: • support populations of rare or endangered species, or fragments of such populations that are present in other similar and geographically-adjacent wetlands; • contain areas of habitat and species richness; • contain elements of taxonomic uniqueness and/or intolerant taxa; • contain habitat suitable for specific species (e.g. physiognomic features); • provide unique habitat (e.g. salt marsh or ephemeral pan; spawning or nursery environments, heronries); • may provide hydraulic buffering and sediment retention for rivers that originate largely outside of urban conurbations, or within residential fringes of urban areas; • have groundwater recharge/discharge comprising a component of the hydrological regime of the wetland;	> 2 <= 3	B

• may be sensitive to changes in hydrology, patterns of inundation, discharge rates, water quality and/or human disturbance; and • are important for conservation, research, education or eco-tourism.		
Moderate Representative of wetlands that: • contain small areas of habitat and species richness; • provide limited elements of habitat that has become fragmented by development (e.g. salt marsh, ephemeral pan; roosting sites and heronries); • provide hydraulic buffering for rivers that originate in urban areas; • are moderately sensitive to changes in hydrology, patterns of inundation, discharge rates and/or human disturbance; • perform a moderate degree of water quality enhancement, but are insensitive to sustained eutrophication and/or pollution; and • are of importance for active and passive recreational activities.	>1 <= 2	C
Low/marginal Representative of wetlands that: • contain large areas of coarse (reeds) wetland vegetation with minimal floral and faunal diversity; • have a high urban watershed:wetland area ratio; • are important for active and passive recreation; • provide moderate to high levels of hydraulic buffering; • may be eutrophic and generally insensitive to further nutrient loading; • are generally insensitive to changes in hydrology, patterns of inundation, discharge rates and/or human disturbance; • have regulated water; and • contain large quantities of accumulated organic and inorganic sediments.	>0 <= 1	D

Rating	**Explanation**
None, rating = 0	Rarely sensitive to changes in water quality/hydrological regime
Low, rating =1	One or a few elements sensitive to changes in water quality/hydrological regime
Moderate, rating =2	Some elements sensitive to changes in water quality/hydrological regime
High, rating =3	Many elements sensitive to changes in water quality/ hydrological regime
Very high, rating =4	Very many elements sensitive to changes in water quality/ hydrological regime

APPENDIX D

Methodology for determining the Conservation Importance of wetlands

D Wetland Conservation Importance

In order to provide a more specific guide to the relative conservation importance of individual wetland patches on the present site, a methodology developed by Ewart-Smith and Ractliffe (2002) was utilised. This methodology assigns low, medium and high conservation importance ratings to individual wetlands, on the basis of the following criteria (note that the highest category applicable to any wetland, based on any one criterion, is the one accorded the wetland as a whole):

- **Low conservation importance:**
  - does not provide ecologically or functionally significant wetland habitat, because of extremely small size or degree of degradation, and/or
  - of extremely limited importance as a corridor between systems that are themselves of low conservation importance.
- **Moderate conservation importance:**
  - provides ecologically significant wetland habitat (e.g. locally important wetland habitat types), and/or
  - fulfils some wetland functional roles within the catchment, and/or
  - acts as a corridor for fauna and/or flora between other wetlands or ecologically important habitat types, and/or
  - supports (or is likely to support) fauna or flora that are characteristic of the region and/or provides habitat to indigenous flora and fauna, and/or
  - is a degraded but threatened habitat type (e.g. seasonal wetlands), and/or
  - is degraded but has a high potential for rehabilitation, and/or
  - functions as a buffer area between terrestrial systems and more ecologically important wetland systems, and/or
  - is upstream of systems that are of high conservation importance.
- **High conservation importance:**
  - supports a high diversity of indigenous wetland species, and/or
  - supports, or is likely to support, red data species; supports relatively undisturbed wetland communities, and/or
  - forms an integral part of the habitat mosaic within a landscape, and/or
  - is representative of a regionally threatened / restricted habitat type, and/or
  - has a high functional importance (e.g. nutrient filtration; flood attenuation) in the catchment, and/or
  - is of a significant size (and therefore provide significant wetland habitat, albeit degraded or of low diversity).

APPENDIX E

Methodology for determining Impact Significance

E METHODOLOGY FOR DETERMINING IMPACT SIGNIFICANCE

METHODOLOGY FOR ASSESSING IDENTIFIED IMPACTS	
Extent of impact being either	**Immediate** (the site and immediate surrounds);
	Local (adjacent residential areas);
	Regional (Western Cape);
	National (Country wide);
	International
Duration of impact being either:	**Short term** (0-5 years);
	Medium term (5-15 years);
	Long term (operational life of the development);
Intensity of impact being either:	**Low** (where natural, cultural and social functions and processes are not affected);
	Medium (where the affected environment is altered but natural, cultural and social functions and processes can continue);
	High (where the affected environment is altered but natural, cultural and social functions and processes are altered to the extent that it will temporarily or permanently cease);
Probability of impact being either:	**Low probability** (possibility of impact occurring is low);
	Probable (where there is a distinct possibility that it will occur);
	Highly probable (where the impact is most likely to occur);
	Definite (where the impact will occur);
Significance of impact:	**Very Low** (where natural, cultural and social functions and processes are essentially unaffected or insignificantly affected)
	Low (where natural, cultural and social functions and processes are slightly affected);
	Low to Medium (where natural, cultural and social functions and processes are slightly affected causing a minor change in functions and processes but are still able to continue)
	Medium (where the affected environment is altered but natural, cultural and social functions and processes can continue);
	Medium to High (where natural, cultural and social functions and processes are altered and most likely the impact will not allow functions and processes to continue, but in some cases, the function or process may continue)
	High (where the affected environment is altered but natural, cultural and social functions and processes are altered to the extent that it will temporarily or permanently cease);
Reversibility Rating:	**Irreversible** (the activity will lead to an impact that is permanent);

	Partially reversible (The impact is reversible to a degree e.g. acceptable re-vegetation measures can be implemented but the pre-impact species composition and/or diversity may never be attained. Impacts may be partially reversible within a short (during construction), medium (during operation) or long term (following decommissioning) timeframe;
	Fully reversible (The impact is fully reversible, within a short, medium or long-term timeframe);

In all instances (-) indicates a perceived negative / adverse impact and (+) is a perceived positive / beneficial impact.

LIZ DAY
CONSULTING *Specialist River and Wetland Consultant*

27 September 2025

Attention: Ms Amanda Fritz-Whyte
PHS Consulting
Paarl

Dear Ms Fritz-Whyte

Proposed development on Portion 134 of Farm No 559 Rooiels: Comments on implications of a revised proposed development layout (garage) from a freshwater ecosystems perspective

Your email of 30 July 2025 refers, wherein you included a revised concept plan for the proposed development of a garage for the storage of vintage cars within the above erf, and requested my comment as to its implications for aquatic ecosystems, in the context of an already-approved development layout, which was assessed in my specialist aquatic ecosystems report (see Day 2023).

Specifically (as per your email of 30 July):

- Construction of a 1.155 m² residential development footprint including a residential dwelling, an ancillary building, and a conservancy tank was approved in April 2024 by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) (DEA&DP Reference No 16/3/3/1/E2/33/1059/23, referred to hereafter as "the DEA&DP EA") - the implications of the development for aquatic ecosystems were fully assessed in my original aquatic ecosystems impact assessment report (see Day 2023).
- The Overstrand Municipality subsequently approved building plans for the house, ancillary building, and conservancy tank (total ±480 m²), all within the EA-approved footprint.
- The previously proposed development of a garage for the storage, display and public viewing of vintage cars was not approved by DEA&DP.
- The applicant now proposes to expand the ancillary building by adding a single-storey garage (±328 m²), directly adjacent to the dwelling, and entirely within the previously approved residential development footprint. <u>The proposed building would not allow for, or intend inclusion of, any facilities for public displays or events associated with the vintage car collection.</u>

1 Background

The main reasons for DEA&DP's refusal to allow construction of the vintage car storage garage (and its associated facilities such as a conservancy tank) related to its then proposed siting in a separate area to the (now authorised) dwelling; its proximity to sensitive wetlands; the need for construction and maintenance of an additional conservancy tank; and its location within a Terrestrial and Aquatic Critically Biodiversity Area (Annexure 3, Section 2, DEA&DP EA).

Following the above response from DEA&DP, the applicant intends to submit a separate authorisation application for the placement of the proposed vintage car garage within the same overall disturbance footprint as the (now authorised) house.

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Reg No 2019/067960/07

The implications of this change are dealt with briefly in the sections below. It must be noted upfront that the comments made in this document have been made with reference to previous reporting on the site by the present correspondent but have not been informed by any recent site visits. It is however (reasonably) assumed that the previous assessments of aquatic ecosystem condition, connectivity and importance as outlined in Day (2023) remain relevant today.

It should also be noted that this correspondence should be considered strictly in the light of information and discussion already provided in Day (2023) and does not on its own constitute a full specialist Environmental Impact Assessment (EIA) report on aquatic ecosystems.

It furthermore does not address any authorisation requirements in terms of the National Water Act (NWA) (Act 36 of 1998). It is however my understanding that the proposed development is already authorised in this regard (your email of 10 September 2025).

2 Description of the proposed garage development

The proposed new garage would have a footprint of ± 328 m²compared with the 375 m^2 footprint of the previously proposed garage (see Day 2023). It would be attached to the approved residential unit, in fact extending in part into a portion of the approved residential footprint, thus consolidating the total zone of disturbance into one area, which has already been disturbed by the former residence and its access road. No additional sewage or greywater would be generated by the proposed garage, which would be used strictly for the storage of vehicles, and no additional parking or access road facilities would be required.

The proposed garage would lie close to, but outside of, all demarcated wetland areas and would be separated from the mapped wetland to the south by the existing road through this wetland (see Figure 1).

3 Implications of the garage from an aquatic ecosystems perspective

The proposed garage would adjoin (and extend into) the approved residential structure. The additional hardened areas associated with its development (e.g. expanded roof extent) would result in an assumed very minor (but unquantified) local increase in stormwater runoff and peak flow discharge from the site, as a result of reduced areas for infiltration and increased hardened areas. This would furthermore magnify the likely impacts of the approved residential unit, by reducing available areas for dissipation of runoff from that structure and its access road. This would however be at least partially mitigated in design by the use of grass-blocks rather than paving at the entry to the proposed garage (see Figure 2). A very slight increase in the passage of concentrated flows into the eastern and western arms of the seep mapped in Figure 1 is thus anticipated, at most.

During the **construction phase** of the development, a measure of additional (albeit localised) degradation of wetlands abutting the development platform could occur, as a result of garage construction activities in close proximity to the watercourses mapped in Figure 1. These activities could include storage of construction material; stockpiling of waste material (e.g. concrete rubble); movement of construction workers and machinery into the wetlands; blasting of rock to allow founding of new buildings; and runoff of contaminated water (sediment and cement inputs)) into adjacent watercourses that do not have adequate ecological buffer areas to mitigate against such impacts. The proximity of the new proposed garage to the approved building means that the availability of already disturbed areas for lay-down areas and site camps would furthermore be limited and these areas would potentially spill over into adjacent least disturbed areas beyond the specified development footprint in Figure 1.

The above impacts have all been considered in Day (2023), where they were rated as of **medium negative significance for both the layout and the construction phase**, and of **low to medium negative significance for the operational phase**. These significance ratings (without mitigation) remain relevant with regard to the proposed new location and layout of the garage development. Cumulative impacts would be slightly higher, given the proximity of the proposed garage to the approved development and the resultant concentration of impacts within the development platform, with constrained space for impact

mitigation. Nevertheless, given the scale of the overall property relative to the additional development, the cumulative impact would remain in the range of low negative significance.

4 Recommended mitigation measures

Mitigation measures outlined below to address the impacts associated with the proposed garage development are largely similar to those included in the Day (2023) assessment, for the residential development on the same development platform, and focus on measures to address runoff-related impacts within the now highly constrained available space between the development and the identified watercourses of concern.

The measures outlined below are considered essential.

i. General measures

a. Mitigation measures included in Day (2023) to address all impacts associated with the now-authorised residential development (all phases) must be implemented as specified in that document.

ii. Mitigation measures to include in design and layout

a. No new parking or road access areas may be created beyond those shown in Figure 2.
b. The development must be confined to the footprint shown in Figures 1 and 2, or a lesser extent.
c. New services (e.g. cables, pipelines) to the site, if desired, must be routed within the existing road prism and not as additional services corridors or footprints.
d. Stormwater dissipation measures must be included in architectural and road / parking design to ensure that runoff is dissipated to pre-construction levels within the total building footprints shown in Figures 1 and 2 – useful measures could include the use of gravel stormwater dissipation areas or "rain gardens" and the provision of extended detention areas within the disturbance footprints; rainwater tanks also provide some attenuation function, up until the point that they are full. The inclusion of grassblocks in the current proposed design is supported, provided that they overlie areas into which infiltration can occur (i.e. not overlying bedrock).
    i. The required interventions must be quantified, shown on plan and approved by at least the project aquatic ecologist and preferably by relevant officials from Cape Nature and the local municipality.
e. .Raised boardwalks / decks should be used where possible in preference to paving, since the former would allow the passage of seepage water beneath built structures.
f. Existing indigenous vegetation abutting the final built structures should be retained as far as possible and the creation of a "garden" / lawn areas in the wetland seeps should not take place.
g. The developed portions of the site including roadways may not be grassed / lawned or vegetated with vegetation that is not locally sourced (propagated from site material) and locally indigenous – non-invasive, non-indigenous plants may be kept within the identified development footprints, provided that they are controlled in containers.

iii. Mitigation against impacts associated with the Construction Phase

The construction phase would pose the greatest risk of impacts to surrounding watercourses and should include the following measures (already largely specified for the authorised residential development):

a. The Construction Phase Environmental Management Programme for the authorised development should be expanded to incorporate measures to address impacts associated with the addition of the garage development;
b. The disturbance footprint shown in Figure 1 must be fenced, prior to the start of any construction activities – construction disturbance must be confined to the footprint shown in Figure 1. Fencing must allow access from the road sides only;

c. Fencing around the disturbance footprint may be temporary but must nevertheless comprise steel mesh fencing that will indicate a significant barrier to construction workers and contractors – no cement / concrete may be used in installation of fencing;
d. Areas outside of the fenced areas, excluding the existing road, must be regarded as "no go areas" during construction – this would require considerable construction phase planning, which must be shown in detailed design-phase documentation;
e. The disturbed road surface could be used for stockpiles of construction material and waste;
f. No blasting of rock may take place – the development footprints need to be based on a "tread lightly" approach, minimizing their footprints;
g. Any existing rubble and/or construction waste from the site must be removed from site and disposed of at an appropriate (legal) location;
h. No construction that takes place from 1m above natural ground level or lower and that requires any active excavation, use of cement, concrete, sand, gravel or any other material likely to wash into wetlands abutting construction areas may take place between 1 May and 30 September of any year, to minimize impacts to sensitive areas;
i. Waste sites; stockpiles; machinery storage areas and all other aspects of construction that require storage space may only be accommodated along the existing road footprint or within the proposed development footprint (including the authorized development footprint). These areas must be agreed on prior to construction commencement and must be managed by the ECO (or similar) in terms of best practice codes, that include allowance for bunding of refueling areas and management of vehicles and waste;
j. An on-site waste management programme must be implemented that effectively controls the management and disposal waste on the site during construction;
k. Following completion of construction, a freshwater ecologist must assess the construction sites and outline measures, where necessary, for rehabilitation of disturbed wetland areas, including, where necessary, requirements for manual or machine re-shaping, manual ripping of compacted areas and replanting of disturbed zones. Implementation of these measures must be overseen by the ECO (or similar) in collaboration with the project freshwater ecologist.

iv. Mitigation against impacts associated with the Operational Phase

The operational phase mitigation measures outlined in Day (2023) should be applicable to the present development application as well.

Assuming that the above mitigation measures are fully implemented as required and are subject to ongoing policing and auditing as outlined in Day (2023) (operational phase mitigation), then the overall impacts of the proposed new garage development would be assessed as of Low (negative) significance from the perspective of its impacts to aquatic ecosystems. These impacts would be of negligible additional significance, compared with those already posed by the approved development.

A no- development alternative would however be preferred.

5 Conclusions

The proposed development layout would be clearly preferred from an aquatic ecosystem perspective, when compared with that previously proposed in Day (2023), given that it would consolidate development impacts into one area. However, that said, this means also that development-related impacts would be concentrated into one area, and impacts of stormwater runoff from hardened surfaces would increase, albeit to an assumed very minor degree.

This correspondence has thus made recommendations for the management and minimisation of stormwater runoff from the site. If these measures are implemented, then the proposed development

would be acceptable from an aquatic ecosystems perspective and the inclusion of the proposed garage in the already approved development footprint would have an overall negligible additional impact, compared with that already assumed in the authorised development, assuming implementation of all required mitigation activities and interventions, as outlined both in this letter and in Day (2023).

I trust that the above comments adequately address your request for comment on the implications of the proposed amended development design (garage component only). Please contact me if you have any concerns or queries regarding this correspondence.

Yours sincerely

Liz Day
PhD; Pr Nat Sci

References cited

Day, E. (Liz). 2023. Proposed construction of a house and ancillary buildings and infrastructure on Portion 134 of Farm 559 Rooi-Els. Specialist Aquatic Ecosystems Impact Assessment and DWS Risk Report. Report to PHS Consulting for Client: Mr Arrie.

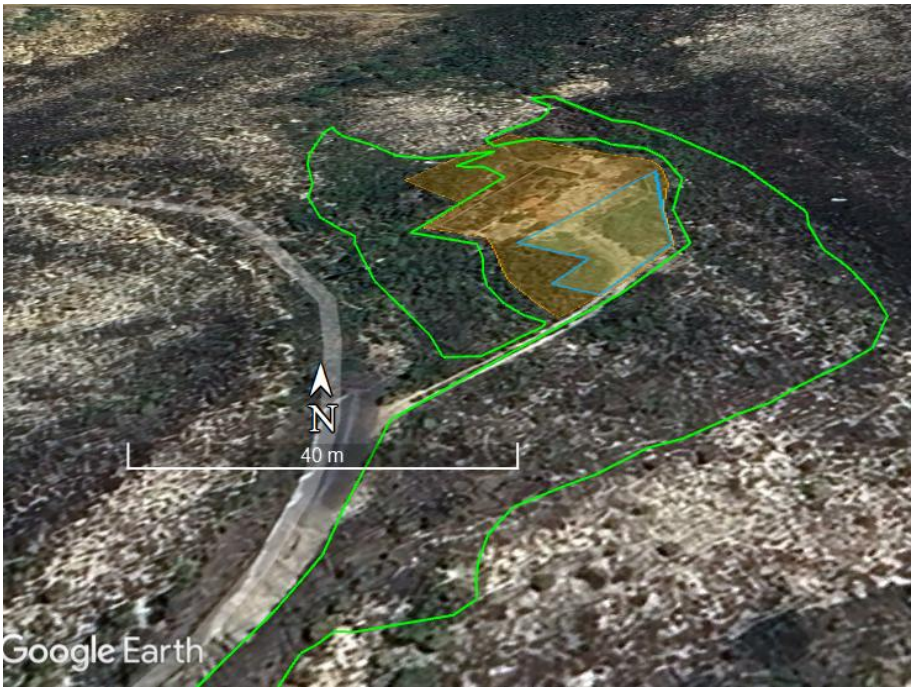

Figure 1
Overlay of proposed new vintage car garage (blue polygon) on overall housing footprint (orange polygon) showing adjacent wetland areas (green polygons). Wetlands described in detail in Day (2023).

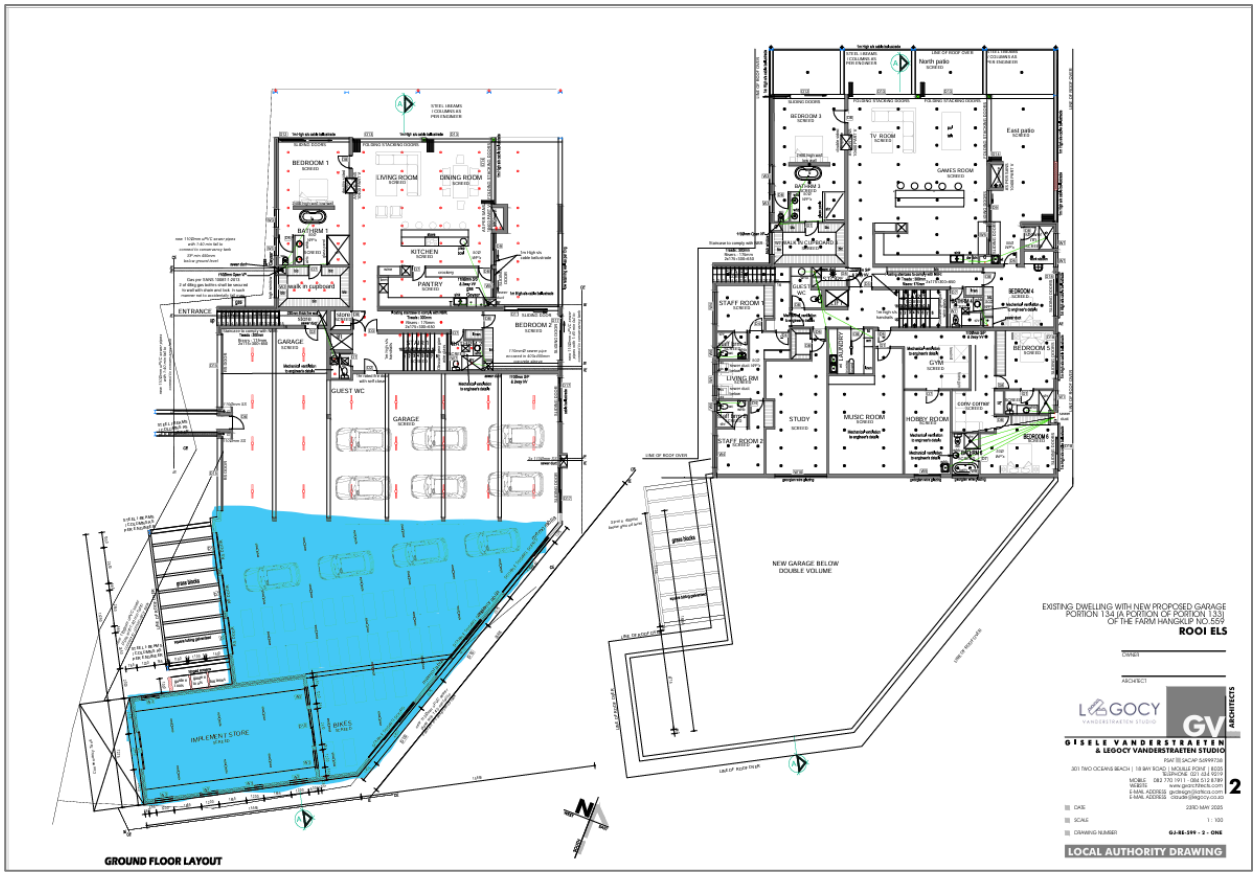

Figure 2
Ground floor layout of proposed new vintage car garage (blue) and (approved) residential unit.

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