Proposed Residential Development and on Portion 38 of Farm 444, Plettenberg Bay

Aquatic Biodiveristy Compliance Statement

Prepared for Cape EAPrac

By

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DECALRATION OF SPECIALIST INDEPENDENCE

- I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP);
- At the time of conducting the study and compiling this report I did not have any interest, hidden or otherwise, in the proposed development that this study has reference to, except for financial compensation for work done in a professional capacity;
- Work performed for this study was done in an objective manner. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public;
- I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse any proposed developments, but aim to present facts, findings and recommendations based on relevant professional experience and scientific data;
- I do not have any influence over decisions made by the governing authorities;
- I undertake to disclose all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by a competent authority to such a relevant authority and the applicant;
- I have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the relevant Act, regulations and any guidelines that have relevance to the proposed activity;
- This document and all information contained herein is and will remain the intellectual property of Confluent Environmental. This document, in its entirety or any portion thereof, may not be altered in any manner or form, for any purpose without the specific and written consent of the specialist investigators.
- All the particulars furnished by me in this document are true and correct.

Specialist: Dr. James Dabrowski (Ph.D., Pr.Sci.Nat. Water Resources)

Date: 21 August 2023

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1. INTRODUCTION

Confluent Environmental was requested to conduct an aquatic biodiversity assessment for a residential development proposed for Portion 38 of the Farm 444, Plettenberg Bay, Western Cape. The property covers a section of the Keurbooms Estuary and while the development footprint is located outside of the estuary, it will occur in relatively close proximity to the estuary. The reporting requirements are prescribed by the legislative requirements of the National Environmental Management Act (NEMA) and the National Water Act (NWA).

1.1 Key Legislative Requirements

1.1.1 National Environmental Management Act (NEMA, 1998)

According to the protocols specified in GN 1540 (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when Applying for Environmental Authorisation), assessment and reporting requirements for aquatic biodiversity are associated with a level of environmental sensitivity identified by the national web-based environmental screening tool (screening tool). An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of:

- **Very High** sensitivity for aquatic biodiversity, must submit an Aquatic Biodiversity Specialist Assessment; or
- **Low** sensitivity for aquatic biodiversity, must submit an Aquatic Biodiversity Compliance Statement.

According to the protocol, prior to commencing with a specialist assessment a site sensitivity verification must be undertaken to confirm the sensitivity of the site as indicated by the screening tool:

- Where the information gathered from the site sensitivity verification differs from the screening tool designation of **Very High** aquatic biodiversity sensitivity, and it is found to be of a **Low** sensitivity, an Aquatic Biodiversity Compliance Statement must be submitted.
- Similarly, where the information gathered from the site sensitivity verification differs from the screening tool designation of **Low** aquatic biodiversity sensitivity, and it is found to be of a **Very High** sensitivity, an Aquatic Biodiversity Specialist Assessment must be submitted.

The screening tool identified the site as being of **Very High** aquatic biodiversity based on the fact that all sites fall within a Freshwater Ecosystem Priority Area (FEPA). A detailed site verification visit was therefore undertaken to confirm the site sensitivity and report accordingly.

1.1.2 National Water Act (NWA, 1998)

The Department of Water & Sanitation (DWS) is the custodian of South Africa's water resources and therefore assumes public trusteeship of water resources, which includes watercourses, surface water, estuaries, or aquifers. The NWA aims to protect water resources, through:

- The maintenance of the quality of the water resource to the extent that the water resources may be used in an ecologically sustainable way;
- The prevention of the degradation of the water resource; and
- The rehabilitation of the water resource.

A watercourse means:

- A river or spring;
- A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and
- 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.

Wetlands are generally characterised by one or more of the following attributes (DWAF, 2005):

- A high water table that results in the saturation at or near the surface, leading to anaerobic conditions developing in the top 50 cm of the soil;
- Wetland or hydromorphic soils that display characteristics resulting from prolonged saturation, i.e. mottling or grey soils; and
- The presence of, at least occasionally, hydrophilic plants, i.e. hydrophytes (water loving plants).

No activity may take place within a watercourse unless it is authorised by the Department of Water and Sanitation (DWS). According to Section 21 (c) and (i) of the National Water Act, a WUL is required for any activities that impede or divert the flow of water in a watercourse or alter the bed, banks, course or characteristics of a watercourse. The regulated area of a watercourse for section 21(c) or (i) of the Act means:

- 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;
- In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or
- A 500 m radius from the delineated boundary (extent) of any wetland or pan.

According to Section 21 (c) and (i) of the NWA, any water use activities that do occur within the regulated area of a watercourse must be assessed using the DWS Risk Assessment Matrix (GN 509) to determine the impact of construction and operational activities on the flow, water quality, habitat and biotic characteristics of the watercourse. Low Risk activities require a General Authorisation (GA), while Medium or High Risk activities require a Water Use License (WUL).

2. APPROACH

The determination of the site sensitivity relied upon the following approaches:

- Interrogation of available desktop resources including:
    - DWS spatial layers;
    - National Freshwater Ecosystem Priority Areas (NFEPA) spatial layers (Nel et al., 2011);
    - National Wetland Map 5 and Confidence Map (CSIR, 2018) – the latest national wetland inventory map for South Africa;
    - Western Cape Biodiversity and Spatial Plan (WCBSP) for Bitou (CapeNature, 2017).
- A site visit was undertaken, during which time the following activities were undertaken:
    - Identification and classification of watercourses within the footprint of the site according to methods detailed in Ollis et al. (2013);
    - Soil augering to confirm the presence of soil indicators (DWAF, 2005) that may indicate the presence of a wetland (if applicable); and
    - Identification of hydrophilic plant species that may indicate the presence of wetland plant species (if applicable).

2.1 Sensitivity Mapping

Watercourses/water resources on or adjacent to the site were mapped in the field and verified at a desktop level using satellite imagery. A protective buffer zone was applied to water resources potentially affected by the development. Buffer zones have been defined as a strip of land with a use, function or zoning specifically designed to act as barriers between human activities and sensitive water resources with the aim of protecting these water resources them from adverse negative impacts. Appropriate buffers were estimated based on buffer zone guidelines developed by Macfarlane and Bredin (2017). These guidelines estimate required buffer zone widths based on a combination of input parameters which include, *inter alia*, the nature of the activity and associated impacts, basic climatic and soil conditions and the implementation of appropriate mitigation measures.

For the purposes of this assessment, the watercourse/water resource AND its associated buffer was considered to be of Very High sensitivity. If any construction and operational activities fall within the delineated watercourse/water resource OR buffer zone, the sensitivity of the site is confirmed as Very High. If all construction and operational activities fall outside of the delineated watercourse/water resource AND its buffer zone, then the sensitivity of the site is confirmed as Low.

3. DESCRIPTION OF ACTIVITIES

The development will involve the construction of twelve free-standing residential homes and associated roads and security services. These are all situated towards the western most extent of the property (Figure 1). The topography of the footprint of the development area site can be described as a broad hilltop which slopes away gently to the north and west and steeply down towards the Keurbooms Estuary to the east.

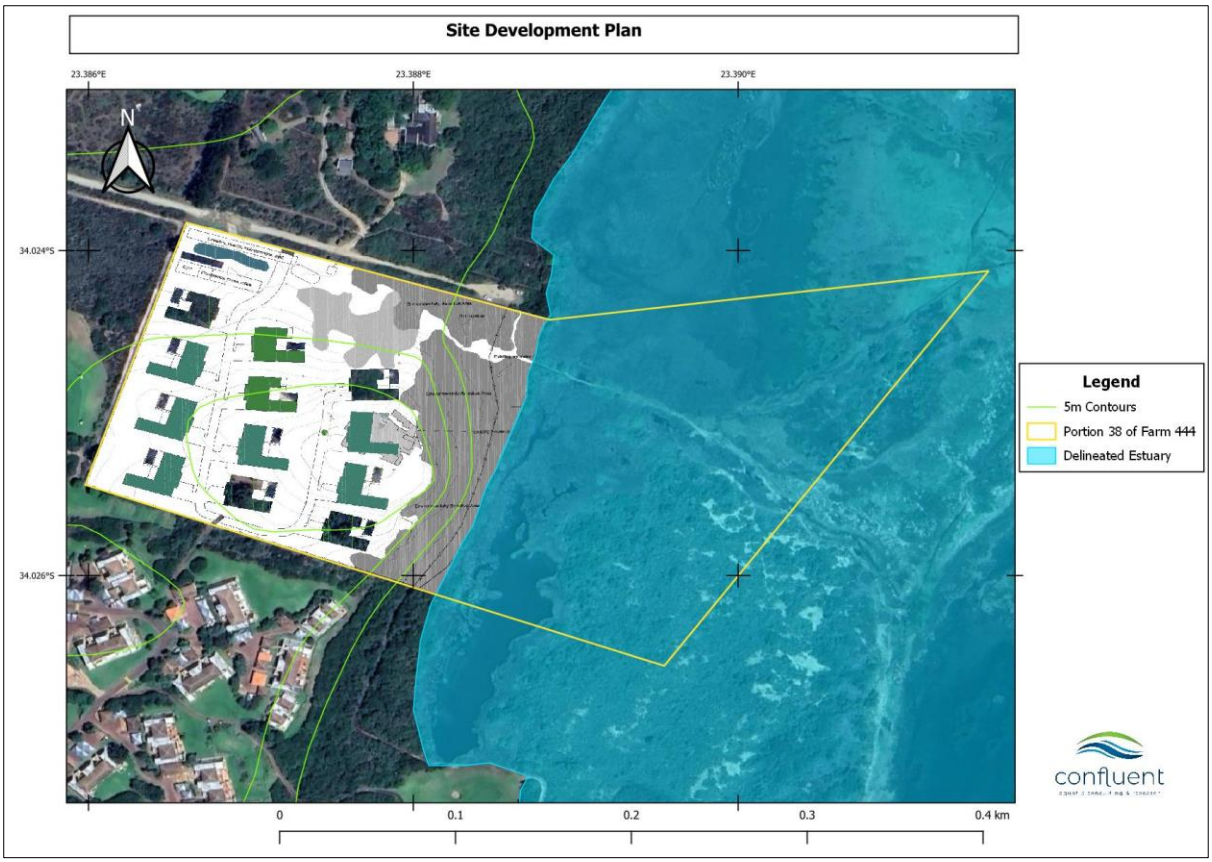

Figure 1: Site development plan indicating the location of the development relative to the delineated edge of the Keurbooms Estuary.

4. DESKTOP REVIEW

Portion 38 of Farm 444 falls in between Plettenberg Bay and Keurboomstrand, within the K60G quaternary catchment area (Figure 2). The catchment area falls within the South-Eastern Coastal Belt (Ecoregion level 1: 20). The terrain is described as low mountains and moderately undulating plains with moderate relief. Altitude ranges between 0-1300 m.a.m.s.l. The Mean Annual Precipitation (MAP) is between 500-800 mm and is a-seasonal and occurs throughout the year.

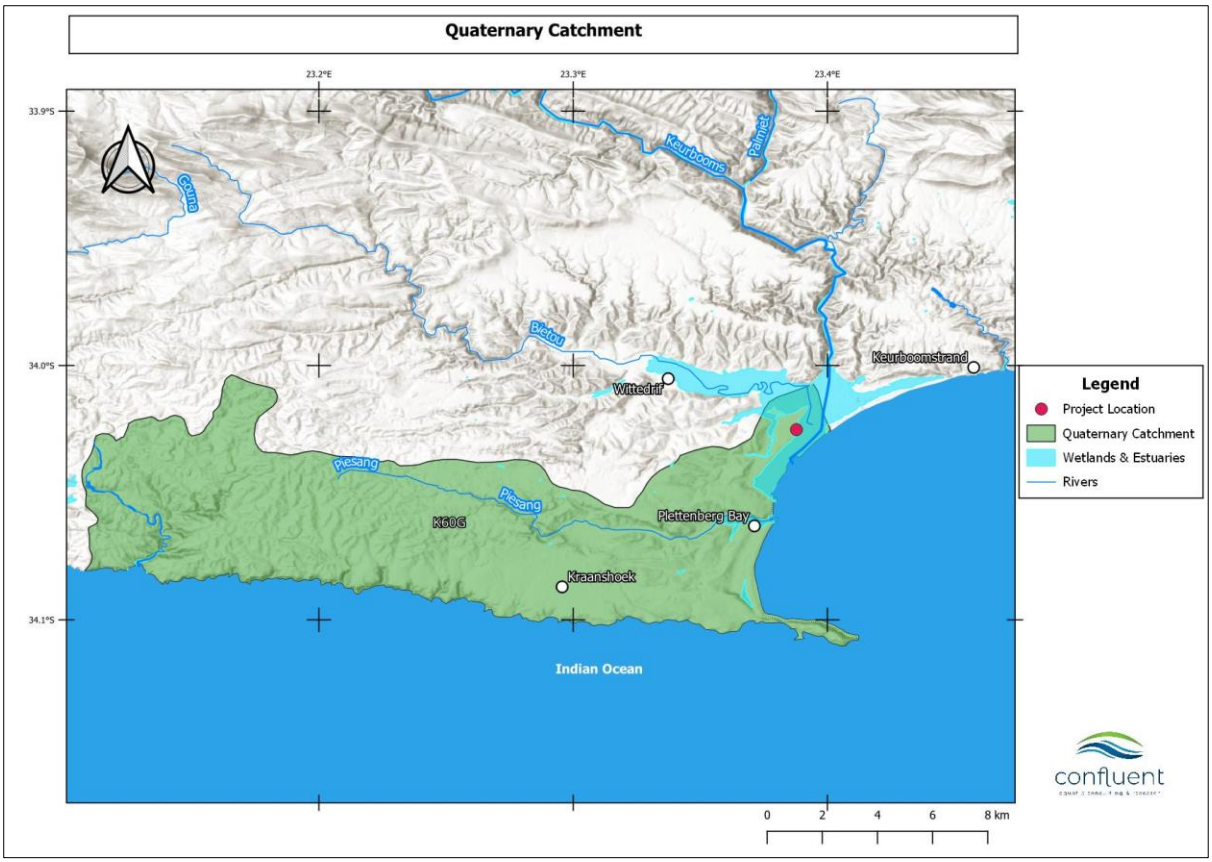

Figure 2: Location of Portion 38 of Farm 444 in relation to quaternary catchment K60G.

4.1 Conservation Planning

4.1.1 NFEPA

The property falls within sub-quaternary catchment (SQC) 9188, which, according to the National Freshwater Ecosystem Priority Atlas (NFEPA, Nel et al., 2011), has been classified as a Freshwater Ecosystem Priority Area (FEPA) (Figure 3). River FEPAs achieve biodiversity targets for river ecosystems and threatened/near-threatened fish species and were identified in rivers that are currently in a good condition (A or B ecological category). Their FEPA status indicated that they should remain in a good condition in order to contribute to national biodiversity goals and support sustainable use of water resources (Nel et al., 2011).

For river FEPAs, the whole SQC is identified as a FEPA, although the FEPA status applies to the actual river reach within such a sub-quaternary catchment. The shading of the whole sub-quaternary catchment indicates that the surrounding land and catchment area needs to be managed in a way that maintains the good ecological condition of the river reach, which in this case, is the Bietou River. It is therefore important that development does not result in any deterioration of the river or its catchment area. Similarly, the Keurbooms Estuary and adjacent wetland areas have been identified as an estuary FEPA, which is also indicative of the good ecological condition of the estuary. The larger drainage network and surrounding land use should therefore be managed to ensure the estuarine system remains in a good ecological condition.

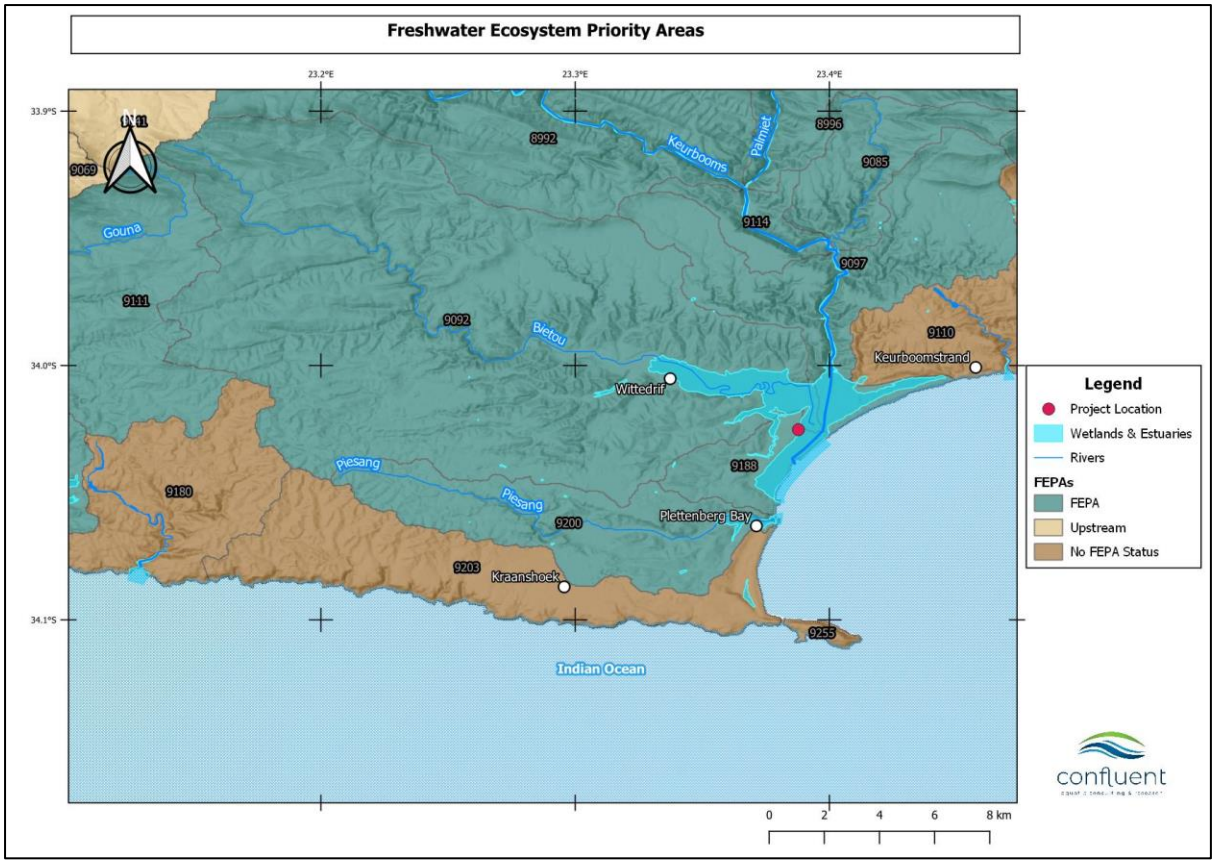

Figure 3: NFEPA categories for sub-quaternary catchments

4.1.2 Western Cape Biodiversity Spatial Plan

The footprint of the development is not located within any aquatic features (freshwater or estuarine) that are included in the WCBSP for Bitou (Figure 4). The Keurbooms Estuary is however mapped as an estuarine Critical Biodiversity Area (CBA1).

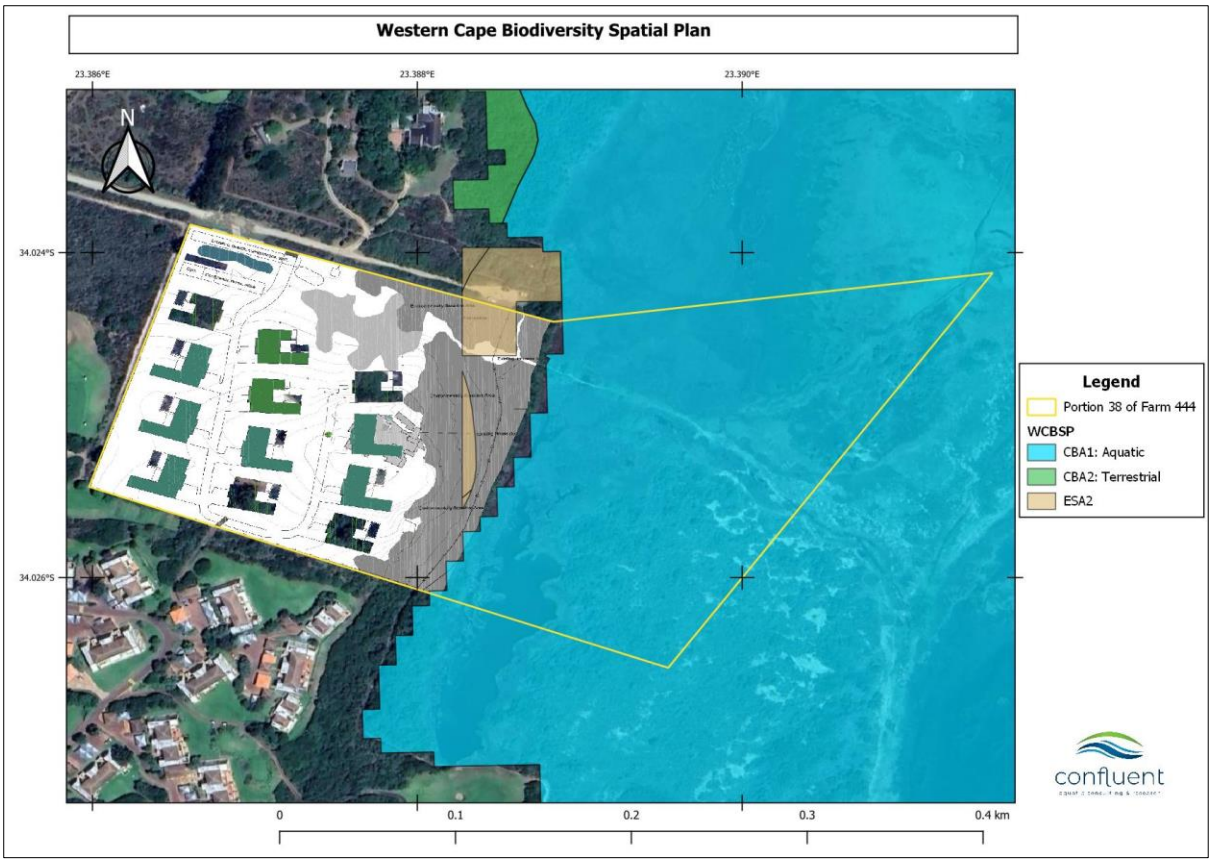

Figure 4: Map indicating the site development plan relative to the Western Cape Biodiversity Spatial Plan (WCBSP).

5. ESTUARINE FEATURES

The Keurbooms Estuary lies immediately to the east of the proposed development. The delineated edge of the estuary was mapped using desktop satellite imagery and was verified during a site visit conducted on 11 August 2023 (Figure 1). The section of the estuary immediately adjacent to the development is supra-tidal salt marsh, dominated by *Juncus kraussi* (Figure 5*).*

Figure 5: Photographs illustrating supratidal estuarine habitat dominated by *Juncus kraussi.*

According to the desktop eco-classification (Van Niekerk et al. 2015) the Present Ecological State (PES) of the Keurbooms Estuary is B, indicating that it is largely natural and that there has only been a small change from its natural reference state (Table 1). Most of the abiotic indices used to derive the overall PES are in fact in a natural condition (A). Modifications to fish assemblages and bird populations are the most important drivers of change from the natural state. The ecological importance is therefore regarded as being high and Turpie (2004) ranked the Keurbooms Estuary as the 18th most important system in South Africa in terms of conservation importance.

Table 1: Summary of the Present Ecological Status (PES) and Ecological Importance of the Keurbooms Estuary

Index	Category
Hydrology	*A*
Hydrodynamnics	*A*
Physical Habitat	*A*
Salinity	*A*
Water Quality	*A/B*
Microalgae	*A*
Macrophytes	*A/B*
Invertebrates	*A*
Fish	*B/C*
Birds	*B*
Overall PES	**B**
Ecological Importance	**High**

Vegetation in between the delineated edge of the estuary and the eastern most row of residential buildings is comprised of dense thicket vegetation (mapped as Goukamma Dune Thicket) and forms a very good buffer in between the development and the estuary (Figure 6). This buffer area slopes steeply from the estuary up to a broad hilltop plateau, which is characterised by more fynbos type vegetation (mapped as Garden Route Shale Fynbos). This buffer area will also provide good refuge for biota that might move in between the estuary and the thicket vegetation.

The entire extent of the property was traversed by foot (apart from impenetrable thicket sections) and no other watercourse was observed on site.

Figure 6: Thicket vegetation bordering the edge of the estuary (mapped as Goukamma Dune Thicket).

6. SENSITIVITY MAPPING

Buffer determination followed a conservative approach and did not consider the implementation of mitigation measures. The buffer is therefore appropriate for a worst-case development scenario, given the catchment and buffer characteristics which are summarised as follows:

- It was assumed that some form of erosion and sediment control will be implemented on site during the construction phase.
- Mean Annual Precipitation Class: 600 - 800 mm.
- Rainfall Intensity: Zone 4 (High).
- The inherent runoff potential of soil in the catchment area is low (A/B soils).
- The slope of the buffer area is moderately steep (20 - 40 %).
- Interception characteristics of the vegetation is considered to be Fair (dominated by indigenous thicket, but with relatively low basal cover).

Based on these inputs the minimum buffer for the estuary is set to 33 m (Figure 7). The actual buffer distance (i.e. based on the current SDP) will however be just over 45 m (taken from the closest house to the estuary). The current SDP will therefore result in a buffer that is more than sufficient for the purposes of protecting the estuary.

Furthermore, as explained in Section 2.1, any development that occurs within the buffer would be considered to be of a Very High sensitivity, while areas outside of the buffer are considered to be of a Low sensitivity. In this case the development footprint (all structures and hard landscaping) falls outside of the estuary and its buffer and entirely within the **Low** sensitivity area.

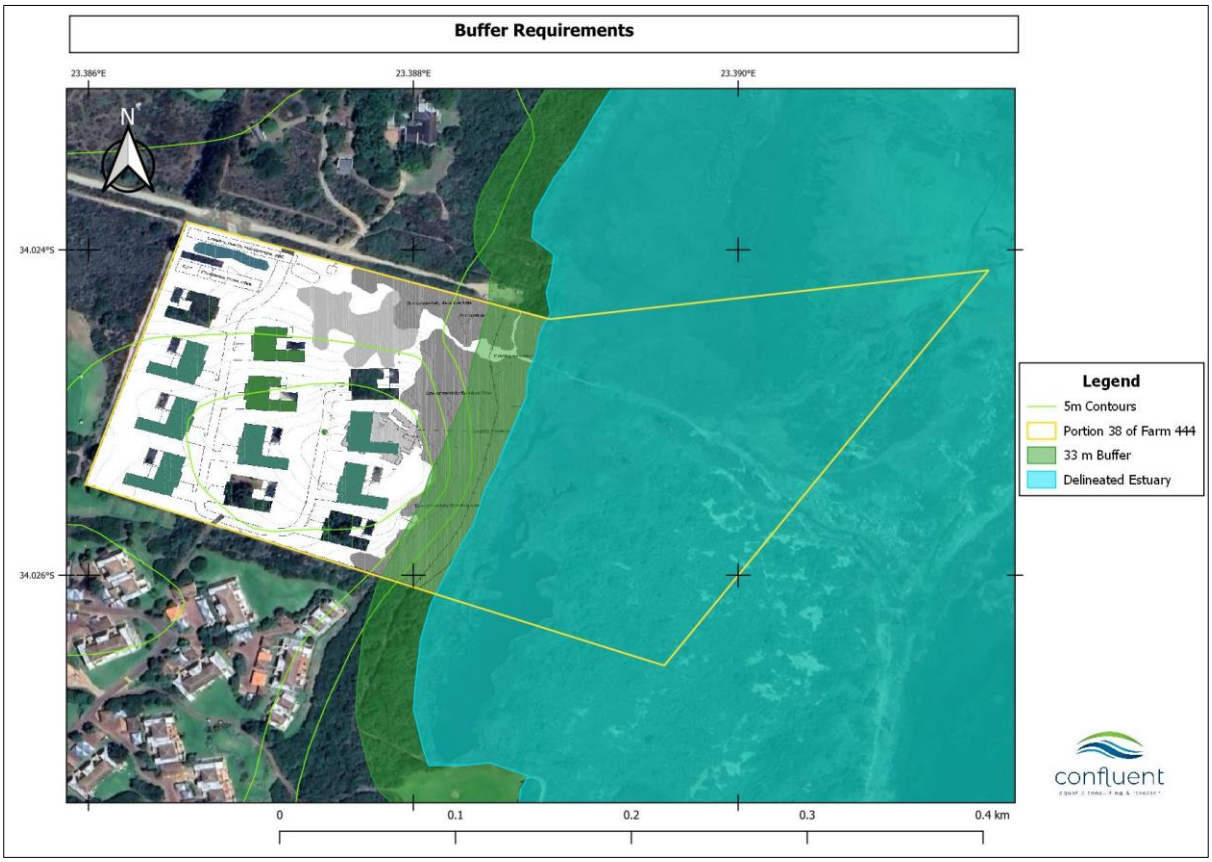

Figure 7: Site development plan relative to the 33 m buffer determined for the Keurbooms Estuary.

7. MANAGEMENT RECOMMENDATIONS

7.1 Stormwater Management

A key impact related to large residential developments is the generation of large volumes of stormwater associated with an increased area of impermeable surfaces (i.e. roads, roofs and other infrastructure). Stormwater is typically conveyed into watercourses, where high volumes (and associated high energy) cause degradation of watercourses, mainly due to the erosion of the bed and banks. These watercourses may not necessarily fall within the development footprint but may still ultimately receive stormwater by connecting the development into an existing stormwater network that discharges into the watercourse. In this way, stormwater generated from the site can still affect watercourses located far outside of the development footprint.

Given the location of the property in a FEPA, it is therefore important that stormwater generated on site should be managed according to Sustainable Drainage System (SuDS) principles. This requires that as much stormwater as possible should be attenuated within the development footprint. For example, the City of Cape Town guideline is that developments

must provide for 24-hour extended detention of the 1-year return interval 24-hour storm event. In this respect the following measures, *inter alia*, should be considered:

- No stormwater must be discharged from the development directly into the estuary;
- Rainwater harvesting tanks must be installed;
- Use of swales and detention ponds to attenuate stormwater runoff, encourage infiltration and reduce the speed, energy and volumes at which stormwater is discharged from the site;
- Use of permeable paving to encourage infiltration into the soil; and
- Use of retention ponds and artificial wetlands to capture stormwater runoff and prevent its discharge from the site.

7.2 Erosion Management

The steeper eastern slopes of the property will be vulnerable to erosion during clearance of the site and the construction phase. It is therefore important that appropriate erosion control measures are implemented, which include *inter alia,* the following:

- Ensure that construction activities do not cause any preferential flow paths and concentrated surface runoff during rainfall events.
- Clearly demarcate the construction area and ensure that heavy machinery does not compact soil or disturb vegetation outside of these demarcated areas.
- Reduce transport of sediment through use of structures such as silt fences and biodegradable coir logs placed along contours.
- Ensure that vegetation clearing is conducted in parallel with the construction progress to minimise erosion and runoff.
- Revegetate exposed areas once construction has been completed.
- Ensure that stormwater and runoff generated by hardened surfaces is discharged in retention areas (i.e. swales or retention ponds), to avoid concentrated runoff and associated erosion.

8. CONCLUSION

8.1 Aquatic Compliance Statement

While the development falls within an SQC that is designated as a FEPA, no freshwater or estuarine features will be directly or indirectly affected by the development. The Keurbooms Estuary is well protected by a very well vegetated buffer over 50 m wide, comprised of indigenous Goukamma Dune Thicket vegetation. Neither construction or operational phase activities are expected to have any negative impacts on drivers of estuarine health (i.e. geomorphology, hydrology, biota, hydrodynamics etc.) With respect to aquatic biodiversity, the sensitivity of the site can therefore be regarded as **Low** and a comprehensive specialist assessment is therefore not required.

8.2 Water Use Authorisation

An estuary is not defined as a watercourse (see Section 1.1.2 above). Therefore, the development will not take place within the regulated area of a watercourse. Consequently,

there are no Section 21 c and i water uses applicable to this development and no water use authorisation is therefore required.

9. REFERENCES

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