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Appendix G: Draft BAR – Specialist Reports

PROPOSED MEDIUM TO HIGH DENSITY RESIDENTIAL DEVELOPMENT ON RE / ERF 2074, MARINE WAY, BITOU LOCAL MUNICIPALITY, WESTERN CAPE

Appendix G1: Aquatic Compliance Statement

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Aquatic compliance statement

Proposed Residential Development on RE/2074, Plettenberg Bay, Western Cape.

Aquatic Compliance Statement

Prepared For: Eco Route Environmental Consultancy

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Date: February 2024
Version: Final

DECLARATION 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.

Jackie Dabrowski (Ph.D., Pr.Sci.Nat. *Aquatic Science*)
SACNASP Registration Number 115166
Co-director: Confluent Environmental (Pty) Ltd

Qualifications: BSc, BSc Honours (Entomology), MSc & PhD (Veterinary Science)

Expertise: > 13 years' experience working on aquatic ecosystems across South Africa, with a focus on the Southern Cape in the last 6 years. Includes research and consulting expertise, having published > 10 water-related research articles and compiled > 400 aquatic specialist reports. Research and consulting have been in a range of sectors including agriculture, urban developments, linear structures, renewable energy, conservation, and mining.

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GLOSSARY

Buffer	A strip of land surrounding a wetland or riparian area in which activities are controlled or restricted to reduce the impact of adjacent land uses on the wetland or riparian area. Buffers are land use specific and are calculated for the specific environmental context and proposed land use.
Characteristics of a watercourse	Means the resource quality of watercourse within the extent of a watercourse.
Construction	Means any works undertaken to initiate or establish activities, site preparation including vegetation removal and ground levelling that may result in impeding or diverting or modifying resource quality.
Delineation of a wetland or riparian habitat	Means delineation of wetlands and riparian habitat according to the methodology as contained in the Department of Water Affairs and Forestry, 2008 publication: A Practical Field Procedure for Delineation of Wetlands and Riparian Areas or amended version.
Diverting	Means to, in any manner, cause the instream flow of water to be rerouted temporarily or permanently.
Flow-altering	Means to, in any manner, alter the instream flow route, speed or quantity of water temporarily or permanently.
Impeding	Means to, in any manner, hinder or obstruct the instream flow of water temporarily or permanently.
Regulated area of a watercourse	a) The outer edge of the 1 in 100-year flood line or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, dams and lakes. b) In the absence of a determined 1 in 100-year flood line or riparian area as contemplated in (a) above the area within 100m of distance from the edge of a watercourse where the edge of the watercourse (excluding floodplains) is the first identifiable annual bank fill flood bench. c) In respect of a wetland: a 500m radius around the delineated boundary (extent) of any wetland (including pans).
Rehabilitation	Means the process of reinstating natural ecological driving forces within part or whole of a degraded watercourse to recover former or desired ecosystem structure, function, biotic composition and associated ecosystem services.
Resource quality	Of a watercourse means the quality of all the aspects of a water resource including: (a) The quantity, pattern, timing, water level and assurance of instream flow; (b) The water quality, including the physical, chemical and biological characteristics of the water; (c) The character and condition of the instream and riparian habitat, and; (d) The characteristics, condition and distribution of the aquatic biota.
Site Assessment	Comprehensive evaluation of the proposed development site, including the identification of wetlands, watercourses, and soil characteristics.
Topography	The physical features of the land surface, considered for its potential influence on drainage and ecological features.
Vadose Zone	Extends from the top of the ground surface to the water table. Also known as the unsaturated zone.

ABBREVIATIONS

CBA:	Critical Biodiversity Area
CD:NGI:	Chief Directorate: National Geo-spatial Information
CR:	Critical Endangered
DFFE:	Department of Environment, Forestry and Fisheries
DWAF:	Department of Water Affairs and Forestry
DWS:	Department of Water & Sanitation
EIS:	Ecological Importance and Sensitivity
ESA:	Ecological Support Area
FEPA:	Freshwater Ecosystem Priority Area
GA:	General Authorisation
GPS:	Global Positioning System
NEMA:	National Environmental Management Act
NFEPA:	National Freshwater Ecosystem Priority Areas
NWA:	National Water Act
NWM5:	National Wetland Map 5
PES:	Present Ecological State
SACNASP:	South African Council for Natural Scientific Professions
SWSA:	Strategic Water Source Areas
WCBSP:	Western Cape Biodiversity Spatial Plan
WUL:	Water Use License

1. INTRODUCTION

Confluent Environmental Pty (Ltd) was appointed by Eco Route Environmental Consultancy to conduct an aquatic assessment for a proposed residential development on RE/2074, Plettenberg Bay, Western Cape. According to the DFFE Screening Tool, RE/2074 has a 'Very High' aquatic biodiversity sensitivity (Figure 2).

RE/2074 is approximately 300 m southeast of the N2 and 750 m west of Plettenberg Bay's town centre. The closest perennial river to the site is the Piesang River flowing 250 m south of the site (Figure 1).

The scope of work for this report is guided by the legislative requirements of the National Environmental Management Act (NEMA) as well as the National Water Act (NWA).

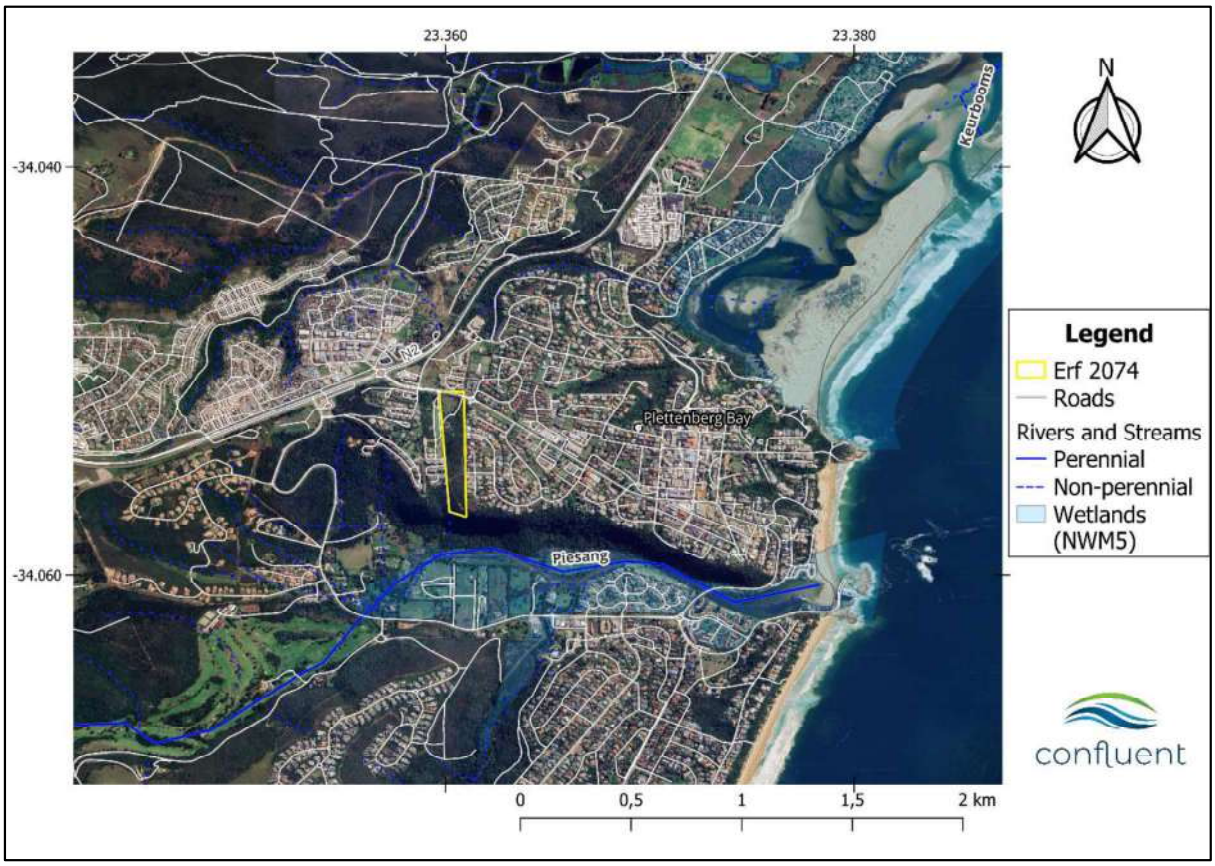

Figure 1. Location of RE/2074, Plettenberg Bay, Western Cape.

1.1 Key Legislative Requirements & Scope of Work

1.1.1 National Environmental Management Act

According to the protocols specified in GN 320 (Protocol for the specialist assessment and minimum report content requirements for environmental impacts on aquatic biodiversity) of the National Environmental Management Act (NEMA; Act No. 107 of 1998), 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.

The screening tool classified the site as being of **Very High** aquatic biodiversity. According to the protocol, a site sensitivity verification must be undertaken to confirm the sensitivity of the site as indicated by the screening tool. This includes an assessment of the following:

Interrogation of available desktop resources including:

- DWS spatial layers (1:50 000 rivers)
- National Freshwater Ecosystem Priority Areas (NFEPA) spatial layers (Nel *et al.,* 2011)
- National Wetland Map 5 and Confidence Map (CSIR, 2018)
- Western Cape Biodiversity Spatial Plan (WCBSP, 2017).

Conduct a site visit to determine the site sensitivity:

- Identification and classification of watercourses within and adjacent to the site according to methods detailed by Ollis *et al*. (2013);
- Determine the watercourse Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) using an appropriate method (if watercourses are present).
- Delineate wetland / riparian areas following methods prescribed by DWAF (2015).
- Determine an appropriate buffer for wetland areas using the site-specific buffer tool developed by Macfarlane and Bredin (2016).

1.1.2 National Water Act

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.

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.

For the purposes of this assessment, a wetland area is defined according to the NWA (Act No. 36 of 1998) as:

"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".

Wetlands must therefore have one or more of the following attributes to meet the NWA wetland definition (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, an authorization (Water Use License or General Authorisation) 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 water uses 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;

b) 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

c) 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 4167 of 2023) 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).

1.2 The Proposed Development

At the time of writing, no Site Development Plan (SDP) was available for assessment as the approach was that environmental sensitivities (including aquatic) would be considered and accommodated in any proposed SDP. For the purposes of this report and the proposed land use for the screening tool, the proposed development is residential housing of unknown density. The assumption, however, is that this will entail typical activities such as vegetation clearance, mass earthworks, conversion of natural surfaces to hard surfaces and installation of water, sanitation, stormwater management and electrical services to support the development.

1.3 DFFE Screening Tool Results

According to the Department of Environment, Forestry and Fisheries (DFFE) screening tool, aquatic biodiversity at the site has a **Very High** sensitivity (Figure 2). The sensitivity features upon which this rating is based are:

- Ecological Support Area 1: Aquatic
- Freshwater Ecosystem Priority Area Sub catchment

The scope of work for this report is guided by the legislative requirements of the National Environmental Management Act (NEMA) and the National Water Act (NWA; Act No 36 of 1998).

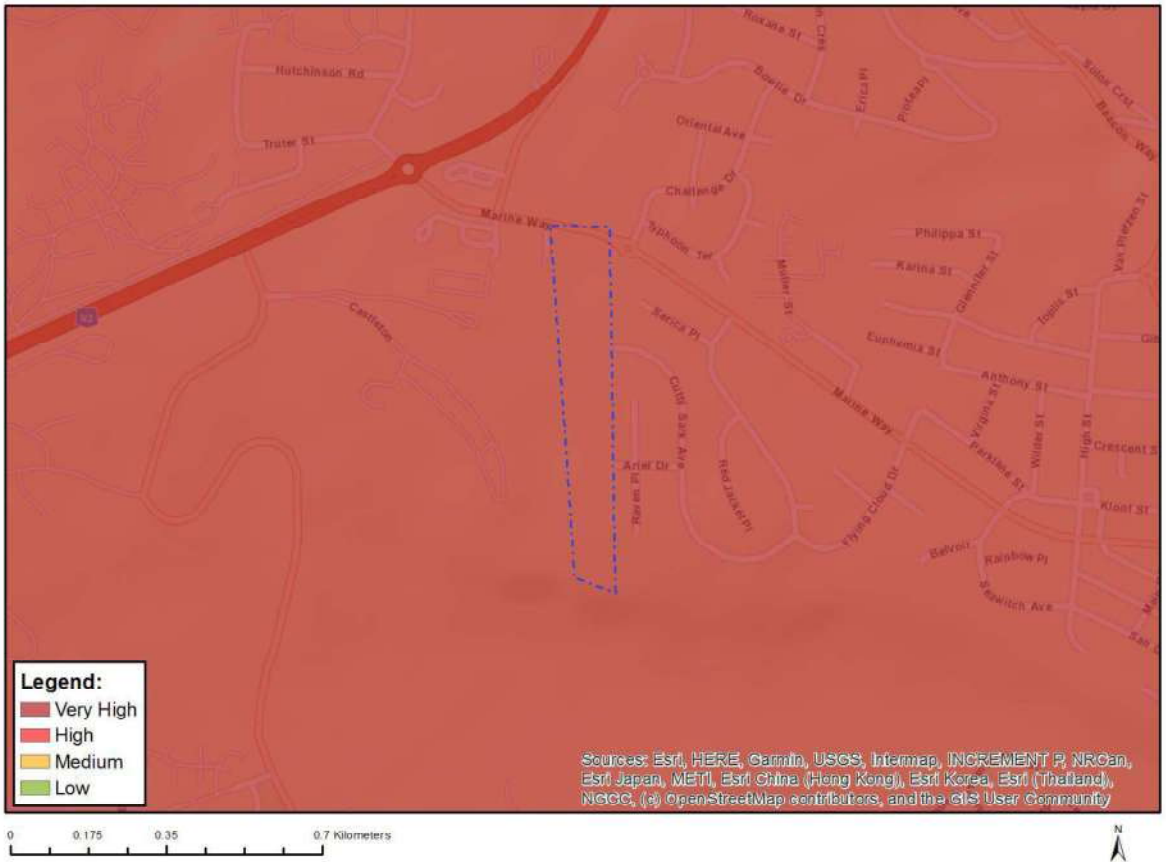

Figure 2. Results of the DFFE Screening Tool which indicate Very High Sensitivity of the Aquatic Biodiversity theme for the preferred development site on Erf 2074.

2. CATCHMENT CONTEXT

2.1 Catchment Features

RE/2074 is situated in quaternary catchment K60G in the catchment of the Piesang River, which is situated towards the south of the property. The river is mapped as the Estuarine Functional Zone (EFZ) at this point. As the rainfall intensity in the area is classified as High and the inherent erosion potential of soils as Very High, erosion of soils and stormwater management are factors which must be considered when developing in this area (Table 1, Figure 3 and Figure 4).

Table 1. Summary of relevant catchment features for the proposed development area.

Feature	Description
Quaternary catchment	K60G
Mean Annual Runoff	52.93 mm
Mean Annual Precipitation	645.00 mm
Inherent erosion potential of soils (K-factor)	0.66, High
Rainfall intensity	Very High
Ecoregion Level II	20 02, South Eastern Coastal Belt
Geomorphological Zone	Lower foothill
NFEPA area	Sub-quaternary reaches 9200 and 9188, FEPA
Mapped Vegetation Type	FFs19: South Outeniqua Sandstone Fynbos (LC)
Conservation	Ecological Support Area 1 and 2, Critical Biodiversity Area 1 (Terrestrial), WCBSP (2017)

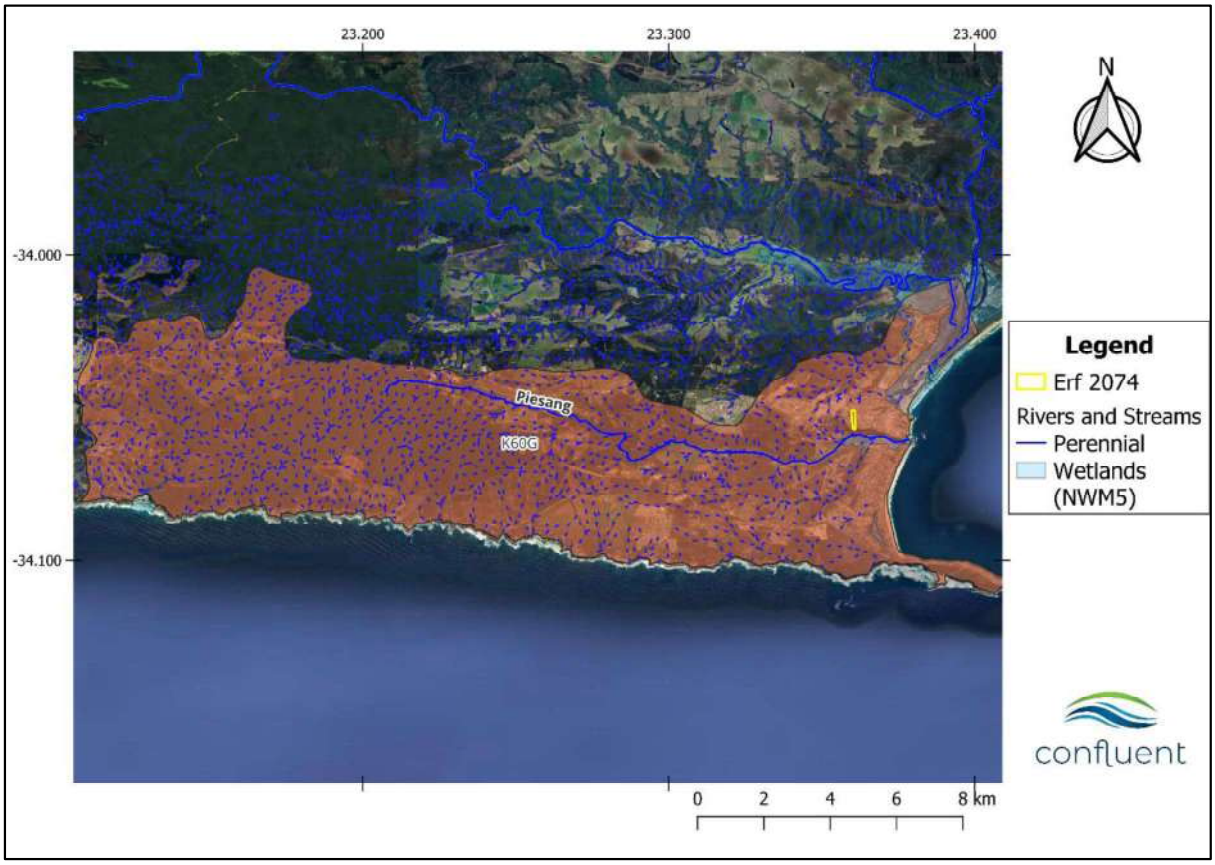

Figure 3. Location of RE/2074 in the quaternary catchments K60G.

As can be seen from the site contours (Figure 4), the northern section of the property drains in a northerly direction, while the southern section of the property drains in a southerly direction towards the Piesang River. The southern section of the property also descends steeply over partially vegetated cliffs to the Piesang River Valley below.

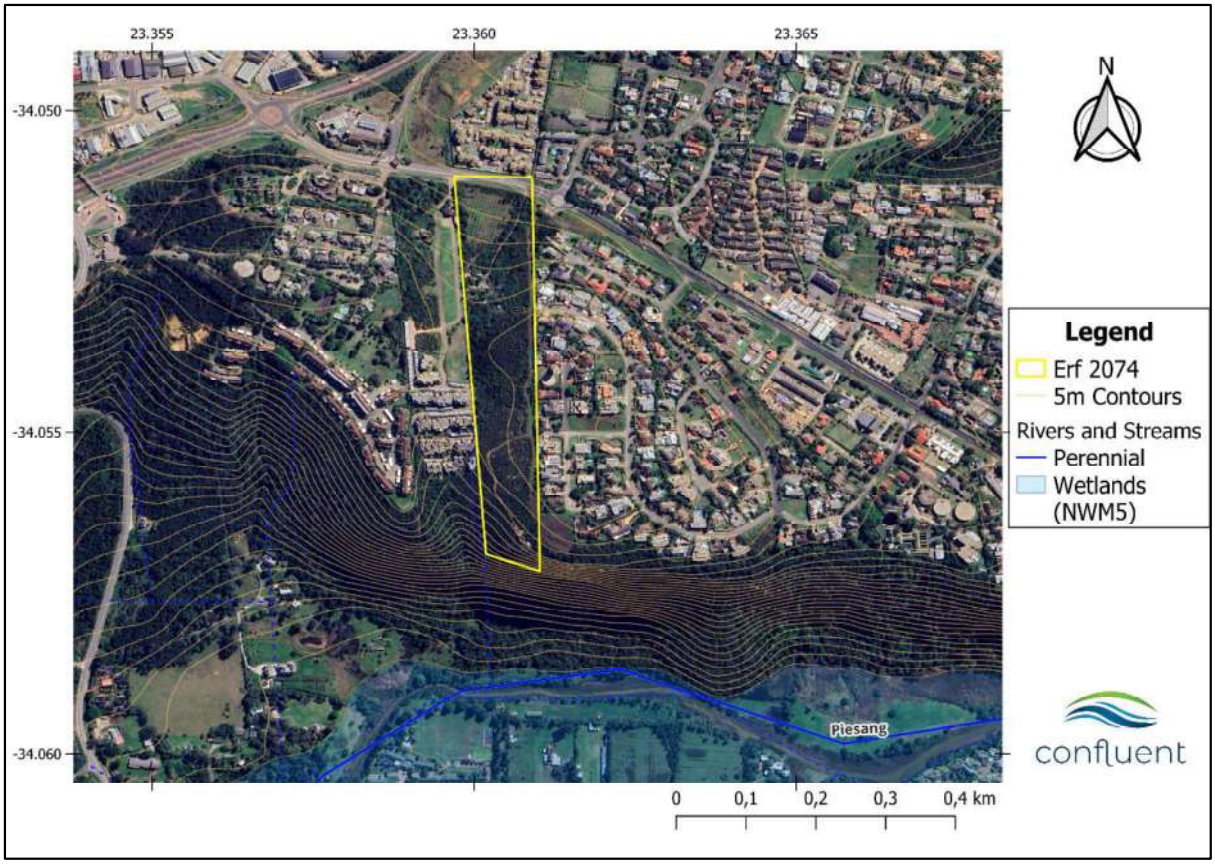

Figure 4: RE/2074 in relation to mapped watercourses and 5m contours.

Rainfall occurs year-round with seasonal peaks in spring and autumn (Figure 5).

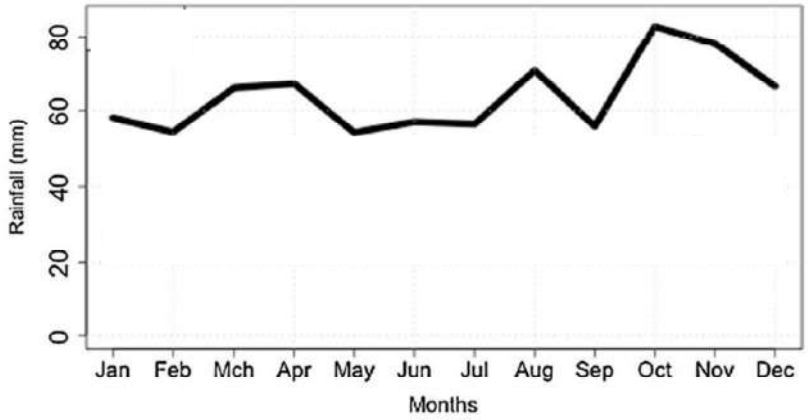

Figure 5. Area-averaged monthly rainfall for the coastal Southern Cape indicating peaks in Mar-Apr, Aug, and Oct. Data averaged between 1979 and 2011 (Engelbrecht et al., 2015).

The project area is located within the southeastern coastal belt (Ecoregion Level 2:20.02). The terrain is described as closed hills of moderate and high relief and moderately undulating plains. Altitude ranges between 0 – 1 300 m.a.m.s.l.

2.2 Vegetation

The mapped vegetation type at the site is South Outeniqua Sandstone Fynbos (FFs19; Least Concern; NVM, 2018). According to Mucina, *et al.*, (2006) the South Outeniqua Sandstone vegetation type has been transformed, with at least 47% protected in the Garden Route National Park, Doring River Wilderness Area as well as in Ruitersbos and Witfontein

Nature Reserves. Furthermore, about 2% are protected in private nature reserves (Mucina, et al., 2006). For a detailed botanical assessment refer to the Botanical and Terrestrial assessment compiled by B. Fouche (Confluent Environmental, Feb. 2024).

2.3 Conservation and Catchment Management

2.3.1 Western Cape Biodiversity Spatial Plan

The Western Cape Biodiversity Spatial Plan (WCBSP; 2017) indicated the following categorised areas on the property and surrounding area; A terrestrial Critical Biodiversity Area 1 (CBA1) along with an Ecological Support Area 1 and 2 (ESA1 and ESA2). From an aquatic ecosystem perspective, the main reasons for the categorisation of the area are that; the area is situated within a FEPA River Corridor and is in a Watercourse Protection Area-South Eastern Coastal Belt (Figure 6).

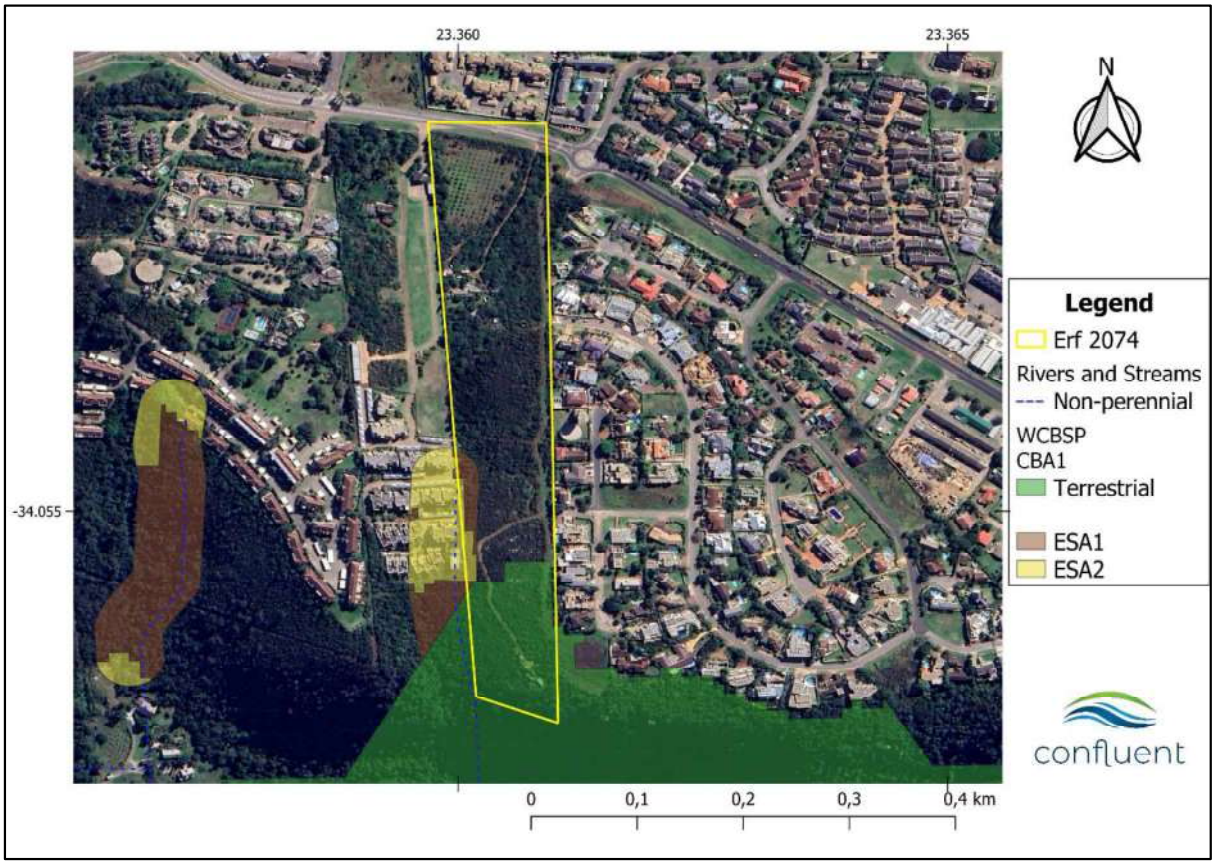

Figure 6. RE/2074 to mapped conservation features of the Western Cape Biodiversity Spatial Plan (2017).

Necessary actions in relation to the WCBSP are to ensure that development on the site does not result in negative impacts on the ecological structure and function of watercourses adjacent to the site (Table 2).

Table 2. Definitions and objectives for conservation categories identified in the Western Cape Biodiversity Spatial Plan (WCBSP, 2017).

WCBSP Category	Definition	Management Objective
Critical Biodiversity Area 1 (CBA1)	Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.	Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.
Ecological Support Area 1 (ESA1)	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.
Ecological Support Area 2 (ESA2)	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.	Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement.

2.3.2 National Freshwater Ecosystem Priority Areas

According to the National Freshwater Ecosystem Priority Atlas (NFEPA; Nel *et al*., 2011) the two sub-quaternary reaches (SQR 9200 and 9188) mapped on the property are classified as Freshwater Ecosystem Priority Areas (FEPAs). Freshwater Ecosystem Priority Areas (FEPAs) are designated areas within freshwater ecosystems that hold high ecological significance and biodiversity. They are identified based on scientific assessments of factors such as habitat quality, species diversity, and ecological integrity. Protecting and managing these areas is crucial for maintaining freshwater biodiversity and ecosystem health. The management objective regarding Freshwater Ecosystem Priority Areas (FEPAs) aims to protect and conserve critical freshwater habitats and biodiversity.

This entails that any development conducted on RE/2074 must consider and seriously mitigate impacts affecting aquatic environments which should be maintained in a good ecological category (A or B PES). This may include but is not limited to the following:

- Minimizing impervious surfaces;
- Implementing Sustainable Drainage Systems to minimise runoff and improve quality of stormwater runoff (SuDS approach);
- Preserving natural vegetation buffers;
- Implementing green infrastructure for stormwater management to reduce habitat disturbance and water pollution;
- Exclude development in buffered areas around wetlands and/or riparian zones;
- Prevent pollution of freshwater ecosystems, by the proper disposal of construction waste, sewage, and hazardous materials (NFEPA; Nel *et al*., 2011).

2.4 Mapped Watercourses

According to the geospatial layers, there are no mapped water courses within the boundaries of RE/2074. However, there is a non-perennial drainage line flowing south on the neighbouring property to the west which connects with the Piesang River. Mapped watercourses also include the Piesang River itself which is in the valley bottom below the cliffs approximately 250 m south of the property. This flows in an easterly direction for approximately 1.8 km until it exits to the sea at the river mouth (Figure 4). The property is located on a watershed with approximately half of the property draining to the north and the other half draining to the south. The northern drainage would indirectly drain to the Keurbooms River via stormwater in urban areas, while the southern drainage would drain more directly to the Piesang River (Figure 4).

2.5 Historical Assessment

Historical imagery shows that RE/2074 has been disturbed from the earliest photo in 1938 until the present by various activities, including small-scale agriculture, the introduction of alien vegetation, vegetation clearing as well as two small residential developments. Recent disturbance from 2016 to the present has been minimal.

In 1938 most of RE/2074 and surrounding areas were in a natural state with limited development restricted to the north of the site. A small area of vegetation was cleared in the northwestern corner, most likely for agriculture. An access road to a small development centre (house?) was evident from the northeast.

In the next two to three decades, development began on neighbouring properties bordering the east and west. Further vegetation clearance is evident on RE/2074 between 1960 and 1974 which was most likely related to construction of a small dwelling and small-scale agriculture. A windbreak of trees was planted along the western boundary at this time and additional access roads added from the northeast. By 2004 the windbreak had been removed.

From the 1990s more extensive bushy trees are observed across the central and northern areas of RE/2074. The area cleared for agriculture to the north is not maintained. Only from 2010 onwards does the agricultural area (olive grove) appear to be maintained and actively managed. In the mid-2000s the neighbouring properties had been fully developed with housing while RE/2074 had only a small area developed for two dwellings (Figure 7).

During the mid-2000s the fynbos area to the south appears relatively undisturbed, while the central area is clearly invaded by large alien trees. Large trees were planted and established in an avenue along the access road and presumably as a windbreak around the olive grove.

Between 2013 and 2021 the most notable changes are densification of vegetation and the development of a new road to the south of the property where construction of a small building foundation commenced on the cliff edge. This building was never completed, but the road is still there (Figure 8).

At no point in assessment of the historical imagery is there any indication of a watercourse that could be present on RE/2074.

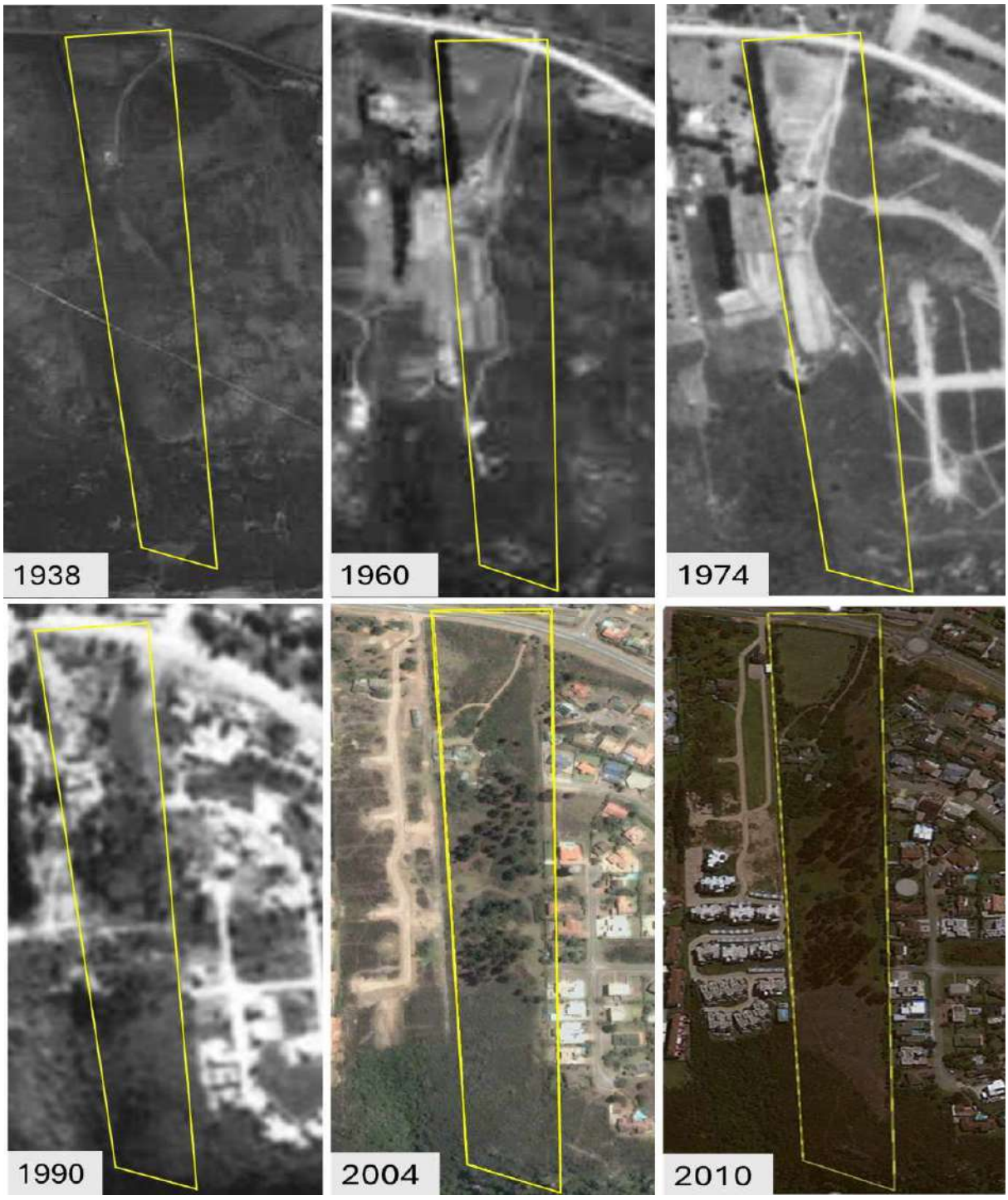

Figure 7. Historical photos showing RE/2074 through notable changes between 1938 and 2010 (CD:NGI & Google Earth imagery).

Figure 8: Historical photos showing RE/2074 through notable changes between 2013 and 2021 (CD:NGI & Google Earth imagery).

3. SITE ASSESSMENT

3.1 Site Visit

The site was visited on three occasions on 8 December 2023 and again on 16 and 17 January 2024. These times cover mid-summer when preceding rainfalls were relatively low and temperatures high. This means that while standing surface water is low, most plants associated with wetter habitats are in their growth period and can be relatively easily observed. The entire site was walked to cover the full extent including sections of the neighbouring property to the west where a small non-perennial drainage line is located (Figure 9 and Figure 10).

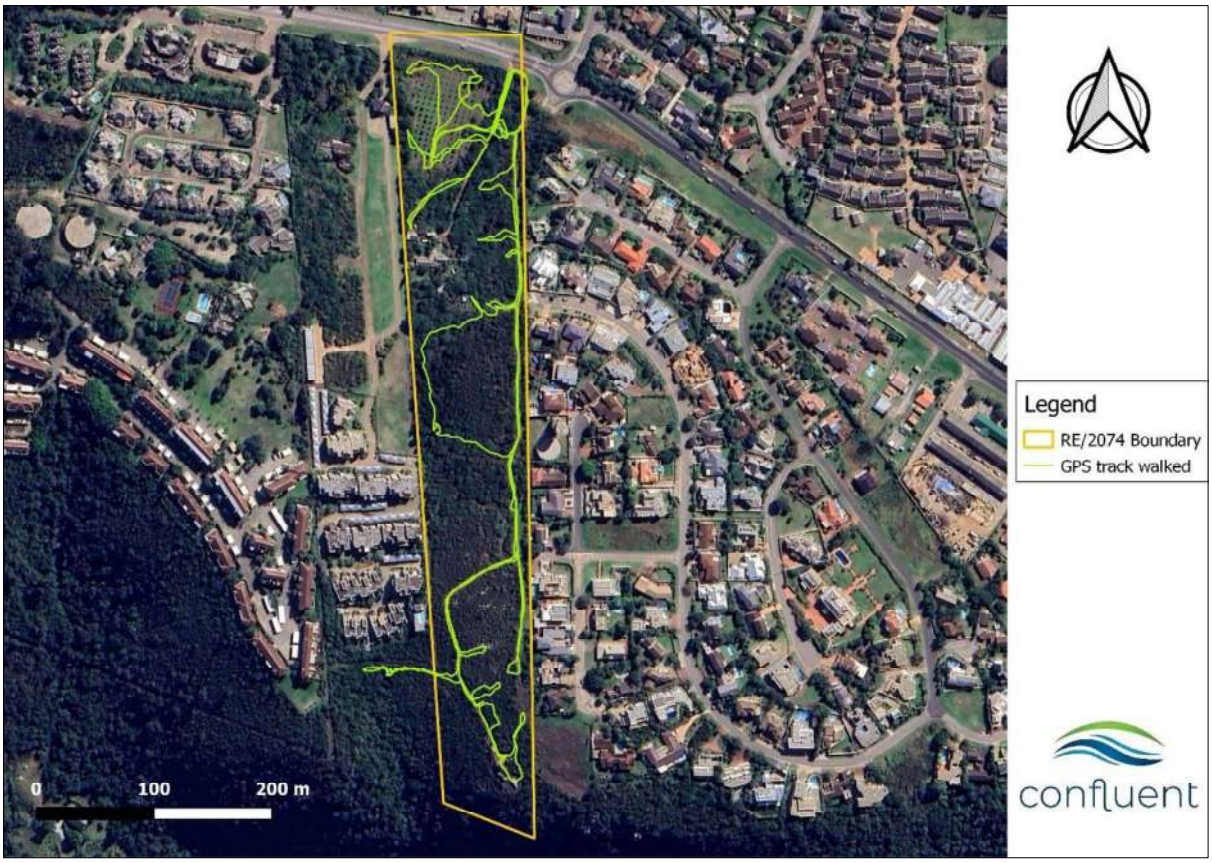

Figure 9. Property boundary showing GPS track walked on three different dates for the site visit.

3.2 Site Assessment

During the site assessment, the only watercourse on / near the property that could be defined in terms of the NWA was in the valley bottom of the property west of RE/2074 (Figure 10). At the time of the site visit a trickle flow of clear water was running through this stream and it had a very densely vegetated riparian zone of indigenous plants. The existing vegetation provides an ideal buffer to this stream as well as excellent habitat for wildlife which would utilise it as a refuge from busier areas of the site. Dominant trees along the stream are Boekenhout (*Rapanea melanophloeos*), Candlewood (*Pterocelastrus tricuspidatus),* WIld Mulberry (*Trimeria grandifolia*), Cape Sumach (*Colpoon compressum*) and Currant rhus (*Searsia tormentosa*).

No watercourses of any sort were observed anywhere else on RE/2074 during any of the site visits.

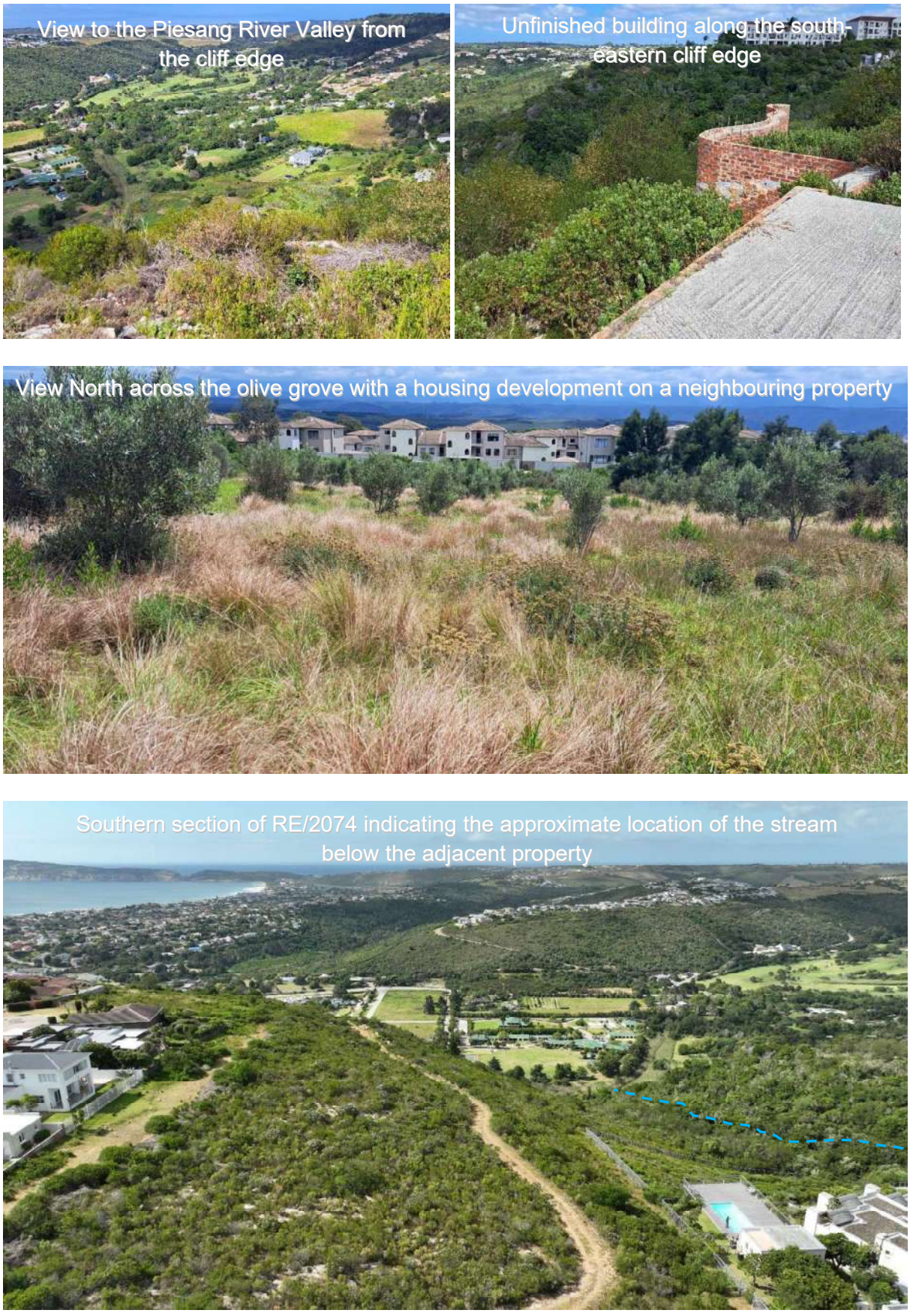

Figure 10. Photos taken during site visits of key points discussed in this report.

3.3 Watercourse Delineation and Buffer

The drainage line on the adjacent property (Erven 9828 and 9829) was verified as present in during the site visit and delineated using site contours (Figure 11).

Buffers are located where the land meets a delineated watercourse, and refer to the zone where these two habitats interface. Buffer areas are linear zones adjacent to watercourses managed with the intention of protecting water resources from diffuse pollution associated with adjacent land uses. In addition, they provide habitat for wildlife within, and act as corridors for movement, feeding and breeding through fragmented landscapes. The wetland buffer areas were determined using the buffer tool developed by Macfarlane and Bredin (2016). The tool uses a wide range of site-specific environmental variables, along with anticipated land-use impacts to determine a recommended distance for the buffer.

The recommended buffer for the adjacent drainage line is **48 m**. For the most part this buffer is aligned with the southwestern boundary of RE/2074, but a small area intrudes into the property boundary near the corner of the property (Figure 11).

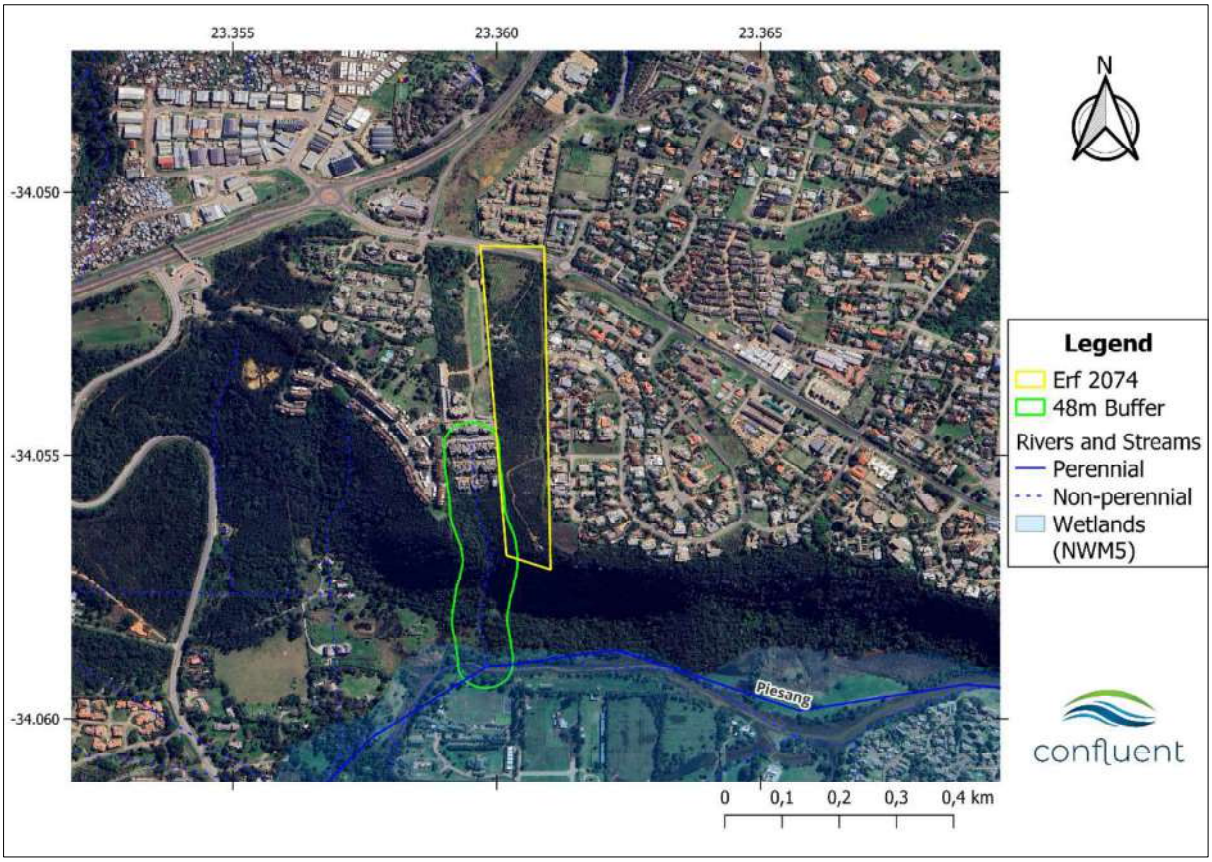

Figure 11. Delineated drainage line and 48 m buffer in relation to the RE/2074 boundary.

4. AQUATIC BIODIVERSITY COMPLIANCE STATEMENT

Aquatic Biodiversity sensitivity for RE/2074 was assessed as Very High according to the DFFE Screening Tool due to two features:

- Ecological Support Area 1: Aquatic
- Freshwater Ecosystem Priority Area Sub catchment

The site has no watercourses within its boundaries, and any potential impacts to the drainage line on the drainage line on the neighbouring property or the Piesang River can be effectively managed to minimise the development's Project Area Of Influence (PAOI).

The mapped ESA1 is aligned with the stream on the neighbouring property, but the WCBSP version of this stream has it in the incorrect location. The stream is mapped on the slope and the resulting ESA1 around it extends more substantially into RE/2074 than it would if it were correctly aligned. The ESA creates a buffer of approximately 32 m around the drainage line, and even with the riparian buffer of 48 m determined in this assessment it barely intrudes into RE/2074.

Located on a watershed, both the north and the south are located in FEPA sub-catchments. The northern watershed is far less sensitive in this regard because it is right at the top of a the catchment with no direct inflow to the Keurbooms River. Runoff from the southern portion of the property could conceivably drain to the Piesang River via the delineated drainage line, providing a more direct link to this watercourse. However, if development is focussed on the northern section of the development which drains in that direction this impact can largely be avoided.

In conclusion, the lack of any mapped watercourses on the property itself, along with fairly straightforward avoidance measures to limit impacts to watercourses nearby render the site sensitivity for Aquatic Biodiversity as **Low**. This assessment therefore constitutes a compliance statement.

5. RECOMMENDATIONS FOR THE SDP

To maintain a Low Sensitivity for Aquatic Biodiversity several recommendations are made to guide development of the SDP as follows:

- Concentrate higher density development on the northern section of the property's watershed where stormwater runoff can be diverted towards existing stormwater drains with low risk of erosion or major impacts to any watercourse. Avoid development on the southern section of the watershed as management of stormwater will be challenging in this area.
- Any construction of stormwater outlets, pipes or associated infrastructure directing stormwater into the drainage line on the neighbouring property will alter the sensitivity of this report to a Very High sensitivity meaning that an impact assessment will be required, as well as a Water Use Authorisation in terms of the National Water Act.
- Implement SUDS-type stormwater management systems to encourage water infiltration, improve quality of runoff, and minimise runoff velocities throughout the proposed development. This may require space set aside for features such as vegetated swales and check / attenuation dams. Volumes required to mitigate post-

development runoff dictate the sizing for these features and must be calculated by the appointed civil engineer. These features are best incorporated up-front in development plans. Other design features include the use of grass / open pavers for parking areas or roads, and vegetated strips instead of concrete wherever possible.

- Each house unit should be equipped with a rainwater collection tank which should ideally be plumbed into some sort of permanent household use such as toilet flushing in the design phase.
- Protecting, rescuing and replanting as many indigenous plants on the site as possible will ensure less water requirements and ensure sustained vegetation cover to protect soil from erosion.
- It would be unwise to discharge any stormwater directly off the edge of the cliff due to high velocity flow creating erosion where it lands. It is assumed this would not be planned but this point is mentioned here to ensure clarity of high-risk actions.

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