Water Use License Application:

Plett Botanical Estate, Erf 8010, Plettenberg Bay, Western Cape

WU38494

DRAFT WULA SUMMARY REPORT

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1 BACKGROUND & PURPOSE

Confluent Environmental was appointed to submit a Water Use License Application (WULA) for the proposed Plett Botanical Estate residential development on Erf 8010, Plettenberg Bay, Western Cape. The property is located approximately 6 km southwest of Plettenberg Bay's town centre with the closest formal road being Robberg Road, which runs along the northern boundary of the property (Figure 1). The Robberg Airport is located immediately to the west of the property. The closest perennial watercourse is the Piesang River, approximately 3.5 km north of the property.

The development will take place within the regulated area of a watercourse and triggers several water uses that require a Water Use License (WUL) in terms of the National Water Act (NWA). The development has not yet commenced.

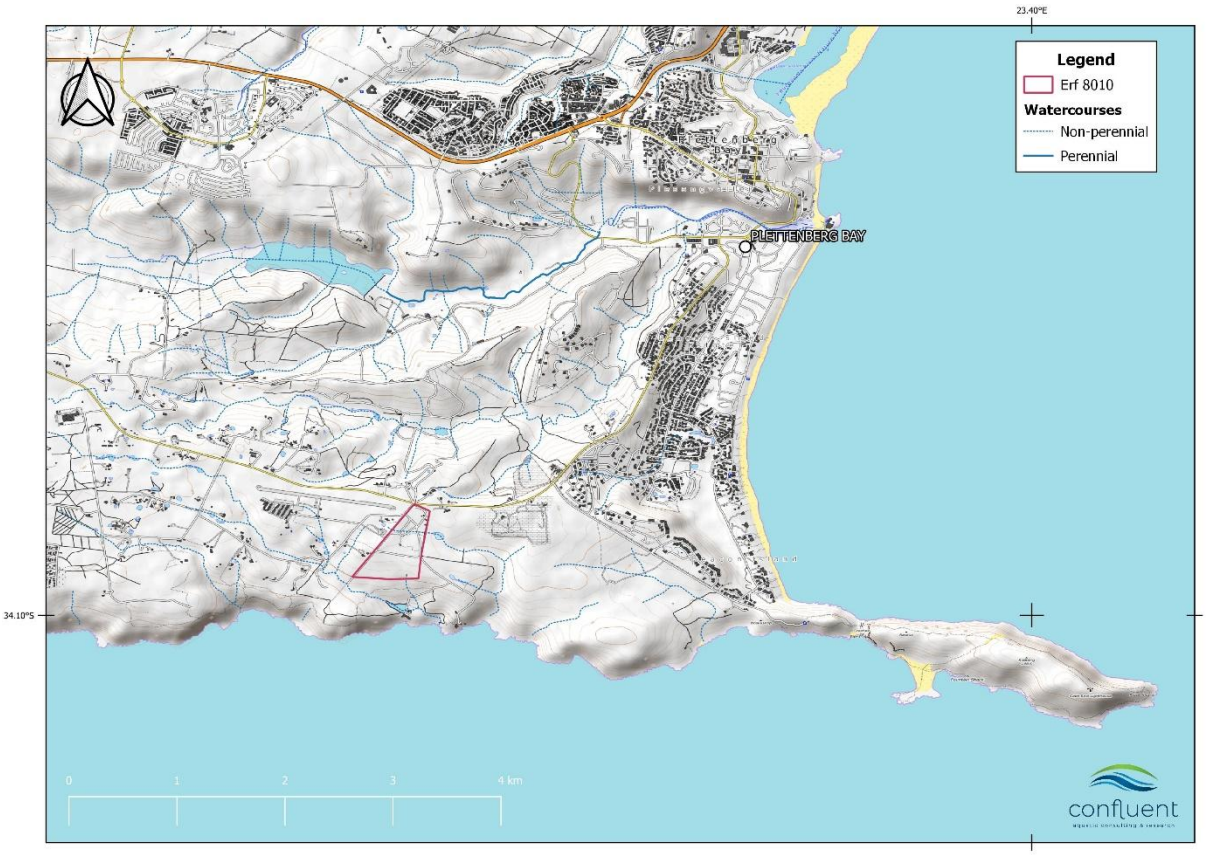

Figure 1. Map indicating the development area west of Plettenberg Bay, Western Cape.

2 LOCATION OF WATER USES

The site falls within Primary Catchment K (Kromme) area and in Quaternary Catchment K60G (Figure 2). According to geospatial data sources, two non-perennial streams run through the property (Figure 3). The northern watercourse originates from the property to the west, flows through the northern third of Erf 8010 and into the neighbouring property on east. Another watercourse flows in a southerly direction, exiting the southern boundary of Erf 8010, before joining a perennial watercourse running through the neighbouring property to the south. A series of small dams have been created along the western boundary of the property and along the mapped northern non-perennial watercourse (Figure 4).

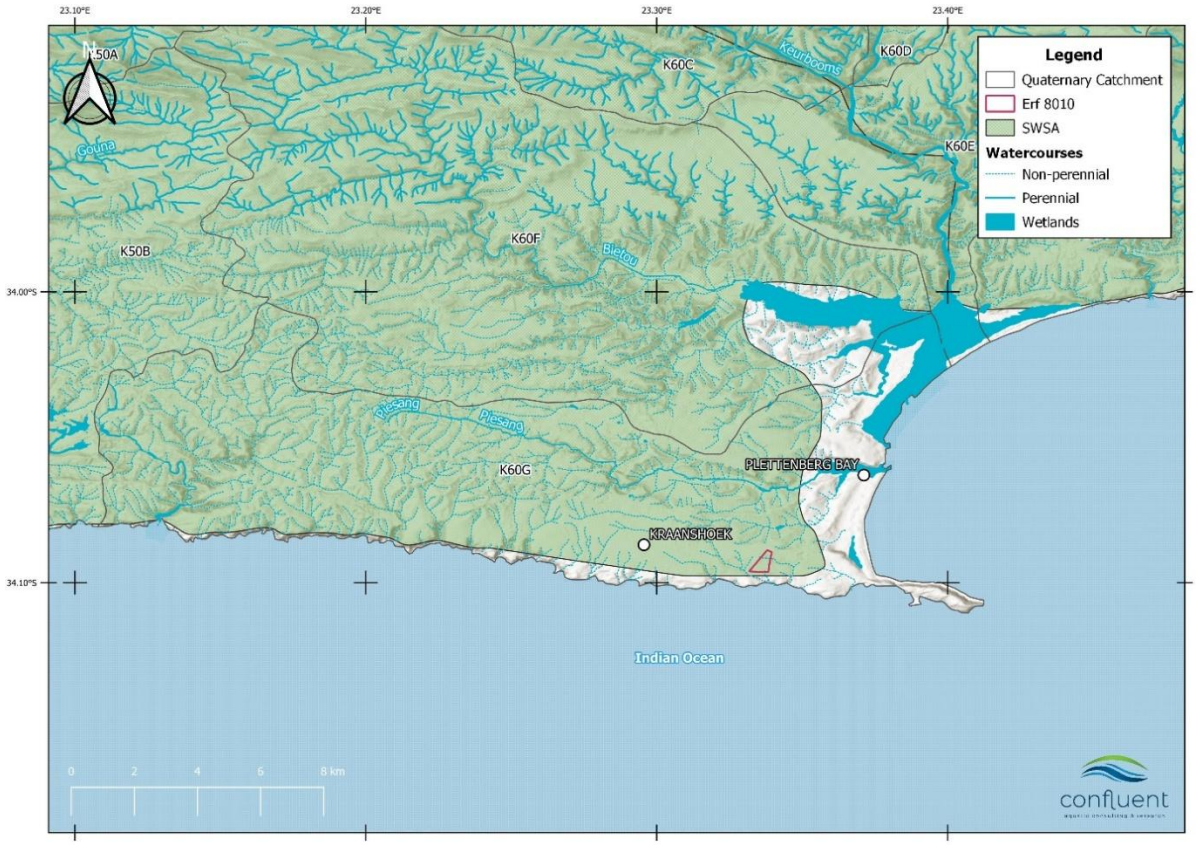

Figure 2: Location of Erf 8010 relative to quaternary catchments and mapped watercourses.

Figure 3: Map showing watercourses mapped on the property.

Figure 4: Dams present on Erf 8010 prior to their removal.

With respect to Dam B, historical imagery indicated the former presence of a depression wetland as far back as 1958. These images also indicated the likely presence of a poorly defined watercourse along the alignment of Dams A, I and H. Subsequent to the original site visit, it was determined that all of the dams indicated in Figure 4 had been constructed without the requisite authorisation from the Breede Olifants Catchment Management Agency (BOCMA). A pre-directive issued to the applicant required that these dams had to be removed and that Dam B should be rehabilitated to restore the former wetland characteristics. All dams have subsequently been removed, allowing free flow of water through the property. Gabion structures have been incorporated into the drainage to dissipate stormwater energy along the drainage. The former basins of the dam will serve as stormwater attenuation basins, releasing stormwater in a controlled manner to downstream habitats. Dam B has been rehabilitated according to the rehabilitation plan described in Section 4.

3 PROJECT DESCRIPTION

The proposed zoning of the property includes general residential (group housing and flats/apartments) and a business zone (Figure 5). The dams and non-perennial drainage lines have been included in the private open space network of the development. The following are aspects of the development are relevant with regards to impacts on watercourses and aquatic biodiversity:

- The Ganzevallei Wastewater Treatment Works in Plettenburg Bay currently has insufficient capacity to accept additional sewage flows from the development. Initially, wastewater will be treated at an onsite sewage package plant on a temporary basis until the capacity of the WWTW has been expanded. Treated effluent will be used for irrigation of open spaces.
- An existing borehole is located in the north-western corner of the property and will be used to supply the development with water in emergency situations. Water will also be used for irrigation of open spaces once the sewage package plant has been decommissioned.

- Stormwater from the northern section of the property will drain towards the northern non-perennial drainage and the rehabilitated dams A, I and H.
- Stormwater from the southern section of the property will drain towards the southern non-perennial drainage line. The stormwater outlet will discharge into a reno mattress stilling basin to dissipate energy.
- According to the engineering service report, Internal swales and attenuation dams will be incorporated into the open space network and will be sufficient to attenuate post-development stormwater flows to pre-development rates.

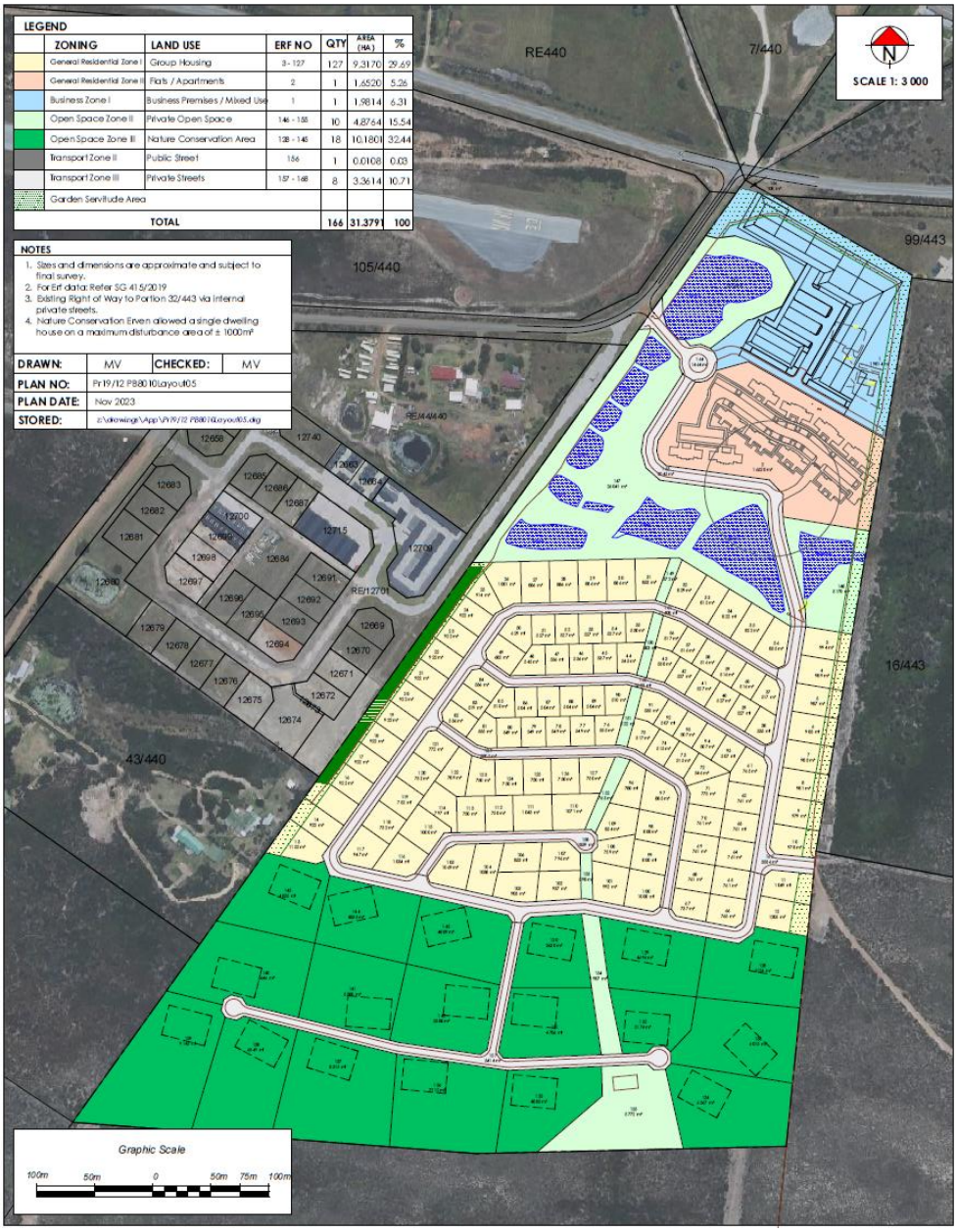

Figure 5: Proposed Site Development Plan for Erf 8010.

3.1.1 Stormwater Management

- The pre-development site drains from the highest northern/central portions towards the southern- and western boundaries.

- There is no formal bulk municipal stormwater infrastructure in the vicinity of the site and all stormwater generated from the property will be released to follow the existing drainage patterns into the natural watercourses. For the purposes of this report, the development site has been split up into two catchment areas, i.e. northern- and southern catchment, based on the natural drainage pattern of the overland run-off (Figure 6).

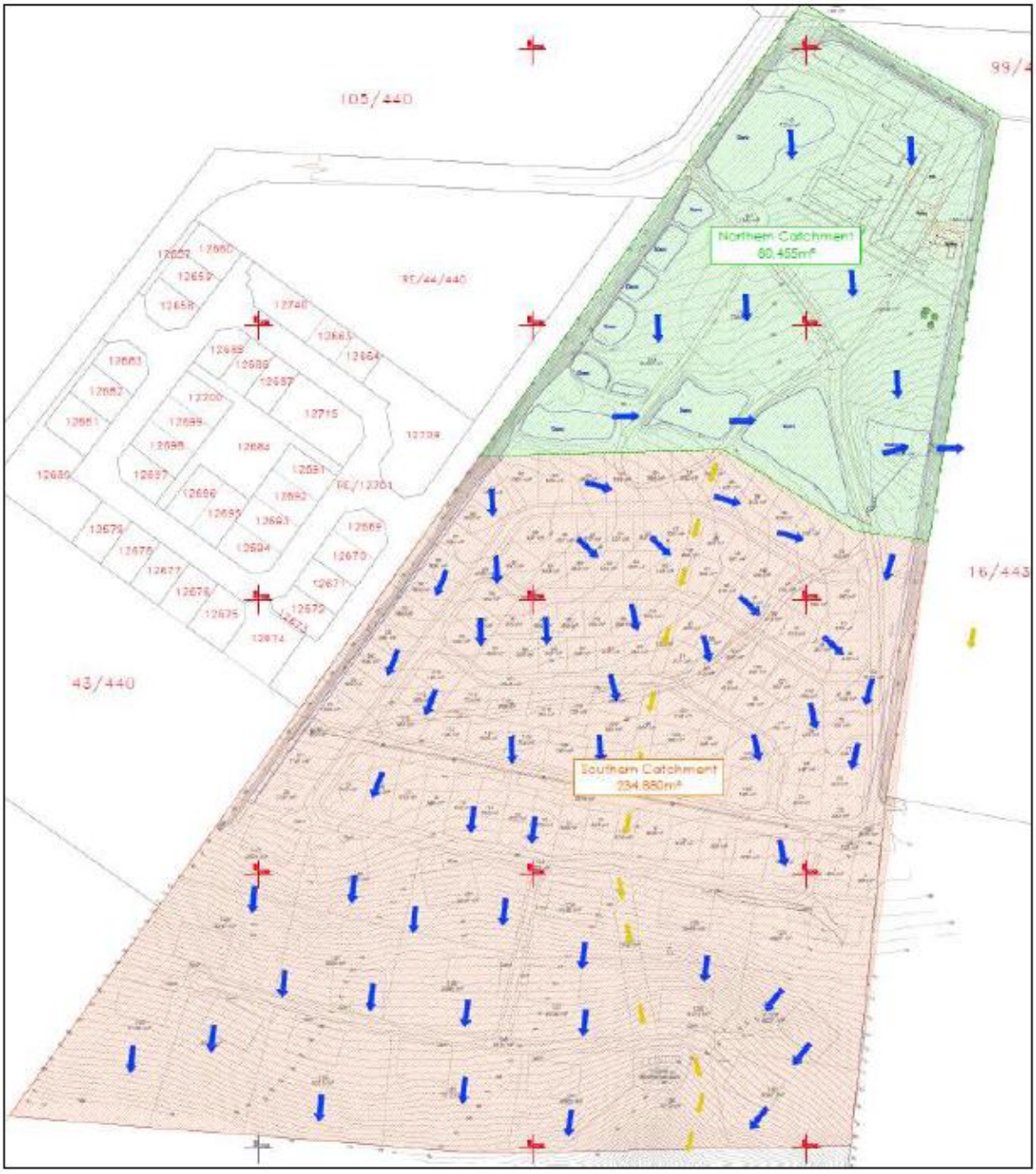

Figure 6: Delineated stormwater catchment areas.

- The permeability of the *in-situ* soils will ensure that a large amount of stormwater run-off permeates into the subsoil layers and a formalised bulk stormwater connection for the development is not required
- Energy dissipation structures will be installed at the stormwater discharge points into natural watercourses. The proposed energy dissipation structures will be constructed

from gabion baskets which will create two weirs where the velocity/energy of the run-off will be lowered in order to prevent downstream erosion.

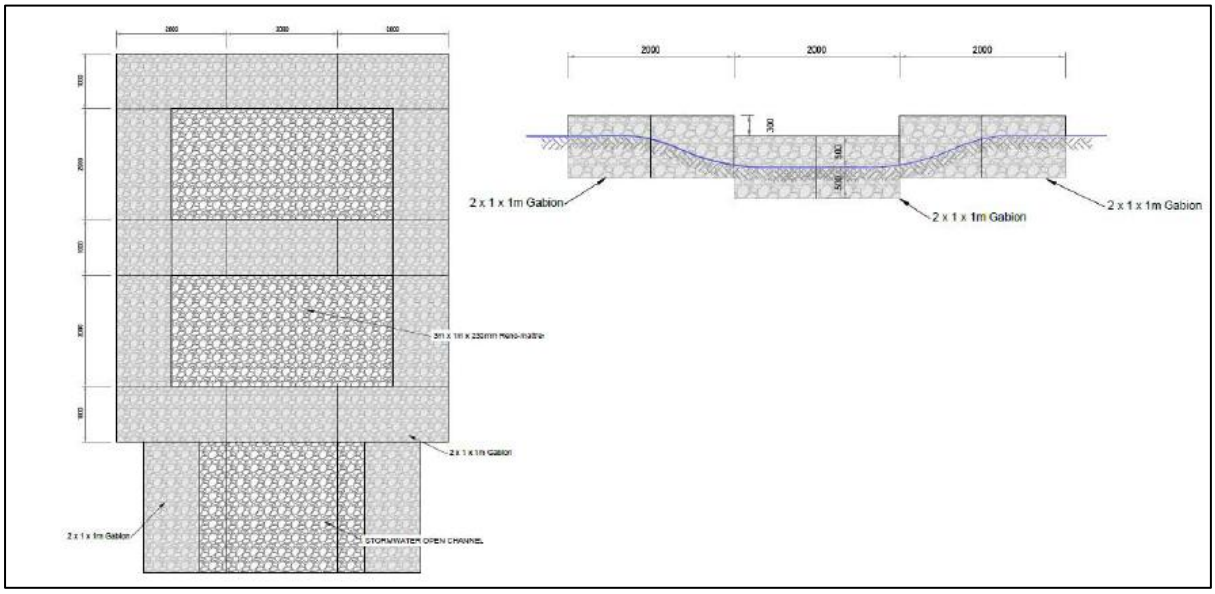

Figure 7: Typical energy dissipation structures

- An open swale network (southern catchment) and existing dam network (northern catchment) will be used to attenuate peak flows to pre-development rates and treat stormwater run-off prior to discharge

3.1.2 Sewage

- The license conditions for the Ganzevallei WWTW authorize an effluent discharge of 6Ml per day. The average daily discharge is currently at approximately 5.8Ml per day, with the reserve 0.2Ml per day reserved for already approved developments. The Ganzevallei WWTW will therefore have to be upgraded in order to accommodate further developments.
- The interim solution for the treatment of wastewater from the development will be the installation of a temporary on-site wastewater treatment plant (refer to section 8.4). A permanent connection to the bulk Bitou Municipal network will be activated once the Ganzevallei WWTW upgrades have been completed.
- The internal sewage infrastructure will consist of a 160mm diameter uPVC Class 34 gravity pipe network and round precast concrete ring manholes in the road reserves. The internal infrastructure will drain towards a new foul sewer pumpstation on the south-eastern boundary of the site.
- The pumpstation will convey all sewage from the development via a 110mm rising main towards the 250mm diameter gravity sewer network inside the Robberg Road reserves. The temporary on-site wastewater treatment plant will be situated at the maintenance buildings for the retail portion of the development (near the north-eastern boundary).
- The permanent connection to the Bitou Municipal network will be installed as part of the initial services installation. The minor amendment to the rising main (once the temporary wastewater treatment plant is removed) will remain the development's responsibility.

- A temporary wastewater treatment plant will be installed inside a 2 x 12m containers next to the maintenance buildings for the retail portion of the development (near the north-eastern boundary). The proposed WWTP will use a combination of conventional treatment (natural bacteria) and membrane technology (microfiltration) to treat the sewage effluent to comply with general water limits stipulated by the Department of Water Affairs. The wastewater will be treated to the Department of Water and Sanitation's General Discharge Limits (Table 1).

Table 1: DWS general limits for wastewater discharge.

Parameter	Concentration
COD	75 (mg COD/l)
Ammonia as Nitrogen	6 (mg N/l)
Nitrate as Nitrogen	15 (mg N/l)
Orthophosphates	10 (mg P/l)
Total Suspended Solids	25 (mg TSS/l)
Faecal Coliform	1000 (per 100 mL)

- The temporary wastewater treatment plant will be implemented in 2 x 90m³/day modular plants. All the treated effluent will be used for irrigation purposes, with dedicated irrigation storage tanks (18 x 10kilo-liter) installed next to the WWTP containers. The WWTP will have the treatment capacity for 180m³ per day.
- The efficacy of the WWTP will rely on regular maintenance and a signed service agreement between the developer and a qualified service provider will be submitted as part of the Service Level Agreement with Bitou Municipality (refer appendix G for a similar agreement proposal). The WWTP will also be equipped with a back-up generator to cater for electrical downtime.
- The temporary WWTP will be removed from site once the Ganzevallei WWTW has sufficient capacity.

4 REHABILITATION

Subsequent to the original site visit it was determined that all of the above-mentioned dams had been constructed without the requisite authorisation from the Breede Olifants Catchment Management Agency (BOCMA). A pre-directive issued to the applicant required that these dams had to be removed and that Dam B should be rehabilitated to restore the former wetland characteristics.

4.1 Rehabilitation of Dam B

The current landowner has opted to rehabilitate the unauthorised activities which will require that Dam B must be filled in and wetland vegetation allowed to re-establish. Depression wetlands drain inwardly and are formed by the long-term inundation of the soil profile, leading to saturated soil conditions and the establishment of associated wetland vegetation. The main focus of the rehabilitation should therefore be to re-establish a saturated soil profile within the current extent of the dam.

4.1.1 Rehabilitation Plan

- The current SDP allows for a 15 m buffer around the perimeter of the dam which is considered sufficient for the protection of the rehabilitated wetland in the long-term;
- Survey and peg the delineated dam and the planned open space around its perimeter;

- Water level in the dam must be drawn down to minimise turbidity throughout the water column and create drier working conditions;
- The dam must be filled in with appropriate subsoil and be covered with a minimum of 30 cm of topsoil. Soil must be graded to maintain a topographical depression so that water drains inwardly from the perimeter of the wetland. Reshape the area to smooth contours;
- Small pockets of open water can be left within the delineated area to provide habitat heterogeneity and to provide refuge for aquatic species currently inhabiting the dam (e.g. amphibian species). These areas must cover no more than 10 % of the total wetland area;
- No rocks, rubble or building material may be used to fill in the wetland;
- The patch of wetland vegetation along the eastern edge of the wetland (Figure 8) could serve as an important seedbank for passive revegetation of the wetland over time. This patch of vegetation must be demarcated and must not be disturbed during infilling and can be used as a reference to gauge the height of infilling required throughout the remaining area of the wetland.

Figure 8: Current stand of wetland vegetation which must be demarcated and left undisturbed.

- Initially it is anticipated that many of the seedlings to establish across the wetland would include alien invasive weeds, so regular weeding to remove young plants using hand-pulling as a preference is recommended. No use of herbicides is permitted within the delineated wetland area. This must be conducted on a monthly basis until such time as wetland vegetation re-establishes across the wetland;
- After approximately 6 months, the vegetation cover and composition should be re-assessed to determine the degree to which more active planting should be undertaken;
- Only indigenous wetland plants found in the area must be used. Based on observations during the site visit, it is anticipated that seasonal to permanent wetland plants would be required for replanting. The following plants are recommended:
    - *Elocharis limosa* (throughout the broader extent of the wetland)
    - *Juncus effusus* (throughout the broader extent of the wetland)
    - *Juncus lomatophyllus* (at the stormwater inlet)
    - *Isolepis prolifera* (at the stormwater inlet)
    - *Nidorella ivifolia* (around the outer margin of the wetland)
    - *Helichrysum cymosum* (around the outer margin of the wetland)

- *Helichrysum petiolare* (around the outer margin of the wetland)

- Stormwater can continue to feed the wetland area, but water must not be purposefully drained out of the wetland.

4.1.2 Environmental Control Officer (ECO)

An Environmental Control Officer (ECO) must be appointed prior to the implementation of the rehabilitation plan. The ECO will be responsible for monitoring, reviewing and verifying compliance by the contractor responsible for rehabilitation with the environmental specifications of this Plan and the conditions of approval. The appointed ECO must be suitably qualified and have experience of environmental monitoring and control on similar scale projects within sensitive environments. The responsibilities of the ECO include but are not limited to the following:

- Develop a 'before' and 'after' photographic portfolio of the dam, elevated earth berm and fire break areas (for monitoring purposes all photos must be taken from fixed points and portfolio must be dated);
- Provide environmental induction training to contractors/workers on site prior to undertaking of the above-mentioned rehabilitation activities;
- Be fully knowledgeable of all licences and permits that may be required to undertake the rehabilitation work;
- Monitor compliance with this Rehabilitation Plan;
- Compilation of a Completion Statement to ensure compliance with the Plan and conditions of approval.
- The ECO must inspect the site during site establishment, preparation and during rehabilitation;
- Maintain a written record of environmental incidents (e.g. spills, impacts, legal transgressions etc.) as well as corrective and preventative measures taken;
- Keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.

5 WATER USES

Based on the project layout and proposed plans, the following water uses have been identified and will form the subject of the WUL application:

- Section 21 (a): Abstraction of water from a borehole
- Section 21 (c): Impeding or diverting the flow of water in a watercourse.
- Section 21 (e): Engaging in a controlled activity identified as such in section 37(1) or declared under section 28(1) of the NWA.
- Section 21 (i): Altering the bed, banks, course or characteristics of a watercourse.

Further details are provided Table 2.

Table 2: List of water uses that will be included in the WULA

Description	Water Use	X	Y
Borehole (BH1)	21 a	23.338	-34.0889
Business Development	21 c & i	23.33876	-34.0899
Sewage Line Crossing	21 c & i	23.33832	-34.0916
Residential Development South	21 c & i	23.33694	-34.0925
Rising Main (Watercourse)	21 c & i	23.33582	-34.0914
Rising Main (Wetland)	21 c & i	23.33745	-34.0896
Residential Development North	21 c & i	23.33826	-34.0908
Irrigation (Wastewater)	21 e	23.3375	-34.0912
Stormwater Outlet	21 i	23.33718	-34.0959
Sewage Pump Station	21 i	23.33674	-34.0961

6 IMPACTS & MITIGATION

Water Use activity	Possible causes of impacts to the water resources	Possible Impacts to the water resource and other water users	Mitigation Measures
Construction Phase			
Residential units and associated services	• Clearing of vegetation	• Erosion and sedimentation of instream habitat.	• Runoff from disturbed areas must be directed through silt traps (silt fences, sandbags etc.) to remove sediment and reduce the sedimentation of the river in the valley below. • Clearing and grading should occur only where absolutely necessary to build and provide access to structures and infrastructure. Clearing should be done immediately before construction, rather than leaving soils exposed for months or years. • Construction phasing (sequencing) must be implemented. Only a portion of the site must therefore be disturbed at any one time according to a planned schedule to complete the needed building in that phase. Other portions of the site must not be cleared and graded until exposed soils from the earlier phase have been stabilized and the construction is nearly completed. • When excavated areas are backfilled the surface must be level with the surrounding land surface, to minimise soil erosion from the areas when the excavation is complete. • During the excavation of pits, roads, construction sites etc. the removed topsoil should be stored and appropriately protected so that it does not wash into waterbodies, causing sedimentation and nutrient loading. This is then used to backfill the area so that it can be effectively rehabilitated. • The 20 m buffer must be implemented and demarcated. No construction activities (apart from stormwater outlets and the access road), stockpiles or laydown of construction equipment are permitted in the buffer.
	• Operation of machinery in close proximity to watercourses	• Disturbance and pollution of wetland habitat caused by construction activities.	• Recommended buffers for each watercourse must be clearly demarcated and indicated as No-Go areas. Access into buffer areas is only permitted for construction of stormwater and sewage infrastructure and road crossings. • Restrict vehicle access to single points that are clearly demarcated; • Working areas must be clearly demarcated and no vehicle access or disturbance must take place outside of demarcated areas; • Excavators and all other machinery and vehicles must be checked for oil and fuel leaks daily. No machinery or vehicles with leaks are permitted to work in wetlands; • No fuel storage, refuelling, vehicle maintenance or vehicle depots to be allowed within the buffer of the watercourse; and • Refuelling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, must be located on impervious bases and should have bunds around them (sized to contain 110 % of the tank capacity) to contain any possible spills;

Water Use activity	Possible causes of impacts to the water resources	Possible Impacts to the water resource and other water users	Mitigation Measures
			• Contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation) and must be routinely serviced; • Stockpiling must take place outside of watercourses and associated buffers. All stockpiles must be protected from erosion, surrounded by bunds and stored on flat areas where run-off will be minimised; • No dumping of construction material on-site may take place; and • An alien invasive plant management plan needs to be compiled and implemented post construction to prevent the growth of invasives on cleared areas
	• Spillages of diesel, petrol, oil, paints, clears and other harmful chemicals.	• Deterioration in groundwater quality	• Site to be monitored regularly for contaminant spillages and if detected, contact spillage remediation companies. • Separate, tightly cover and monitor toxic substances to prevent spills and possible site contamination. • Cover stockpiles of building materials like cement, sand and other powders. • Regularly inspect stockpiles for spillages and store away from waterways or drainage areas. • Collect any wastewater generated from site activities during construction in settlement tanks then screen, discharge the clean water,and dispose of remaining sludge according to environmental regulations. • Utilise the existing boreholes as the monitoring network.
Operational Phase			
Stormwater Outlets	• Concentrated high energy, high volume flows	• Erosion and scouring of instream habitat	• Stormwater must, as far as is possible, be managed onsite through the implementation of Sustainable Drainage Systems (SuDS) which should include infiltration devices that capture and retain a portion of the runoff and allow it to infiltrate into the soil. Such devices include infiltration trenches, infiltration basins, dry wells, leaching catch basins, porous pavement/blocks, and infiltration islands. • Runoff from impervious surfaces should be directed towards open areas (e.g. lawns and parks) to increase infiltration and minimise high-level flow into stormwater infrastructure and watercourses. • Sidewalks should be graded so that runoff drains into open areas (e.g. lawns and parks) rather than toward the street. • Stormwater leaving the development footprint must not under any circumstances be allowed to be discharged directly onto the steep slopes of the southern embankment (i.e. the steep slopes to the south of the development footprint).

Water Use activity	Possible causes of impacts to the water resources	Possible Impacts to the water resource and other water users	Mitigation Measures
			• Stormwater leaving the development footprint must be conveyed/piped to an area of lower elevation and must be discharged through an appropriate energy dissipation structure (e.g. detention basin, reno mattress etc.). • As stormwater drains discharge directly into the watercourse, inlets to these drains should be labelled with painted or prefabricated messages that warn residents of the environmental hazards of dumping materials into stormwater drains. • The recommended 20 m buffer must be enforced, with a view to providing some protection to the watercourse.
Irrigation with wastewater	• Surface runoff and seepage of wastewater	• Deterioration in surface water quality	• Irrigation within the buffer of all watercourses must not be permitted. • The proposed WWTP will use a combination of conventional treatment (natural bacteria) and membrane technology (microfiltration) to treat the sewage effluent to comply with general water limits stipulated by the Department of Water Affairs. The wastewater will be treated to the Department of Water and Sanitation's General Discharge Limits • The efficacy of the WWTP will rely on regular maintenance and a signed service agreement between the developer and a qualified service provider will be submitted as part of the Service Level Agreement with Bitou Municipality (refer appendix G for a similar agreement proposal). The WWTP will also be equipped with a back-up generator to cater for electrical downtime. • A wastewater balance must be compiled to ensure that the volumes of wastewater generated on a daily basis do not exceed the irrigation requirement, thus leading to situations where higher volumes of wastewater would need to be released into the environment.
	• Leaching of wastewater into soil profile	• Deterioration in groundwater quality	• Ensure the WWTP comply with SANS1200 Part K:Civil Engineering Standard Specifications, NWA, Water Quality Guidelines (DWAF), SANS1913:Planning, Design, and Construction of Sanitation Systems, Wastewater Treatment Plant Design and Operational Guidelines (DWAF, 2008) • All areas where potential leachate may occur are to be paved and cemented. • Regularly service the WWTP and inspect the integrity and efficacy of the WWTP. • Ensure emergency procedures are in place to rapidly repair WWTP should failure occur. • Set up a comprehensive monitoring system to monitor the effluent quality. • Incorporate monitoring network as implemented during the construction phase into operational phase monitoring. • The WWTP to be monitored regularly for any leakages. I

Water Use activity	Possible causes of impacts to the water resources	Possible Impacts to the water resource and other water users	Mitigation Measures
			• Should a leak be detected or the monitoring boreholes be contaminated, a baseline Phase 1 Contamination Assessment should be undertaken and the site remediated in consultation with a contamination remediation consultant and the Authorities.
Abstraction of water from borehole	• Over abstraction	• Depletion of groundwater resource	• Yield testing of boreholes as per SANS 10299-4:2003 standards. Do not exceed sustainable yield of borehole. • Groundwater level and quality monitoring – reduce abstraction in the event of an anomolous lowering of groundwater level • Take Ecological Water Reserve into account during water balance.
		• Deterioration of groundwater quality	• Groundwater level and quality monitoring – reduce abstraction in the event of an anomolous lowering of groundwater level and/or deteriorating water quality
Operation of Pump Station	• Lack of maintenance of infrastructure	• Sewage leaks into the environment.	• Undertake routine maintenance of pumps and other critical infrastructure according to a prescribed schedule; • Maintenance must be undertaken during low flow periods to allow more time to adequately complete tasks; • An emergency response plan must be formulated and implemented in the event that telemetry systems indicate an emergency situation has occurred; • In an emergency situation residents must be informed through relevant media and social media to, as far as possible, avoid discharging waste into the sewerage system until such time the emergency has been attended to; • An annual audit of the pumpstation must be undertaken to ensure that required maintenance has been undertaken and that all degritting, screening, emergency power generation, telemetry, and pumps and are operating to the required specifications and purpose

7 REPORTS AND OTHER TECHNICAL DOCUMENTS

Table 5: Additional technical reports relevant to application

Technical documents	Compiled by	Date compiled
Freshwater Assessment Report	Confluent Environmental	April 2026
Civil Engineering Services Report	VITA Consulting Engineers	July 2025