
Water Use License Application:
Meulenzicht Landgoed, Erf 25537, George, Western Cape
WU45111

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 Meulenzicht Landgoed residential development on Erf 25537, George, Western Cape. The proposed development site is located adjacent to the N2 approximately 5.5 km southeast of George's town centre. The closest perennial river to the property is the Swart River which is located adjacent to the north-eastern corner of the property and flows in a south-easterly direction before meeting the Kaaimans River, which flow into the Kaaimans Estuary (Figure 1).

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 east of George, Western Cape.

2 LOCATION OF WATER USES

The property is located in the quaternary catchment K30C in the catchment of the Swart River (Figure 2). The main rivers draining this catchment are the Swart and Kaaimans, both of which originate in the Outeniqua Mountains to the north. The Swart River feeds the Garden Route Dam and terminates in the Kaaimans River Estuary. The project area falls within the South-Eastern Coastal Belt (20) Level 1 ecoregion (20.02 Level 2 Ecoregion), which is characterized by moderately undulating plains and low mountains with altitude ranging from 0 to 1 300 m above mean sea level. Watercourses are typically located at the base of relatively steep slopes. Mean annual precipitation for the catchment area is approximately 800 mm per year and occurs all year-round, with peaks in October to November and March to April. Dominant

The topography of Erf 25537 is characterised by low undulating hills that slope steeply down to watercourses (mapped as non-perennial streams). All mapped watercourses within the property boundaries were associated with wetland habitat (mapped as W2 to W4 – Figure 3):

- W2 and W3: Channelled valley bottom wetlands
- W4: Seep Wetland

The wetland systems are not obviously visible in historical imagery but generally followed distinct linear areas that were either sparsely planted with pine trees or were not planted at all. Given the distinct soil characteristics of the area (i.e. a coarsely textured A horizon overlying a clay enriched B horizon) lateral sub-surface flows down slopes is expected to be an important source of water to these wetlands. Pines consume high volumes of water and their presence on the adjacent slopes would have deprived the wetlands of lateral sub-surface flows, reducing the extent (i.e. width) and visible footprint of the wetland systems. These wetland systems have become more visible since the pine plantations have been cleared.



Figure 3: Watercourses mapped within the development area.

3 PROJECT DESCRIPTION

The development involves the construction of the Meulenzicht Landgoed bordered by Urbans Boulevard along the north-west (Figure 4). Meulenzicht Landgoed will comprise primarily of full title residential erven and a wastewater treatment plant that will service Meulenzicht as well as Oumeulen Village (west of Urbans Boulevard). Multiple roads, stormwater, sewage and water supply infrastructure will also need to be constructed. The treatment plant will discharge treated wastewater into W2.

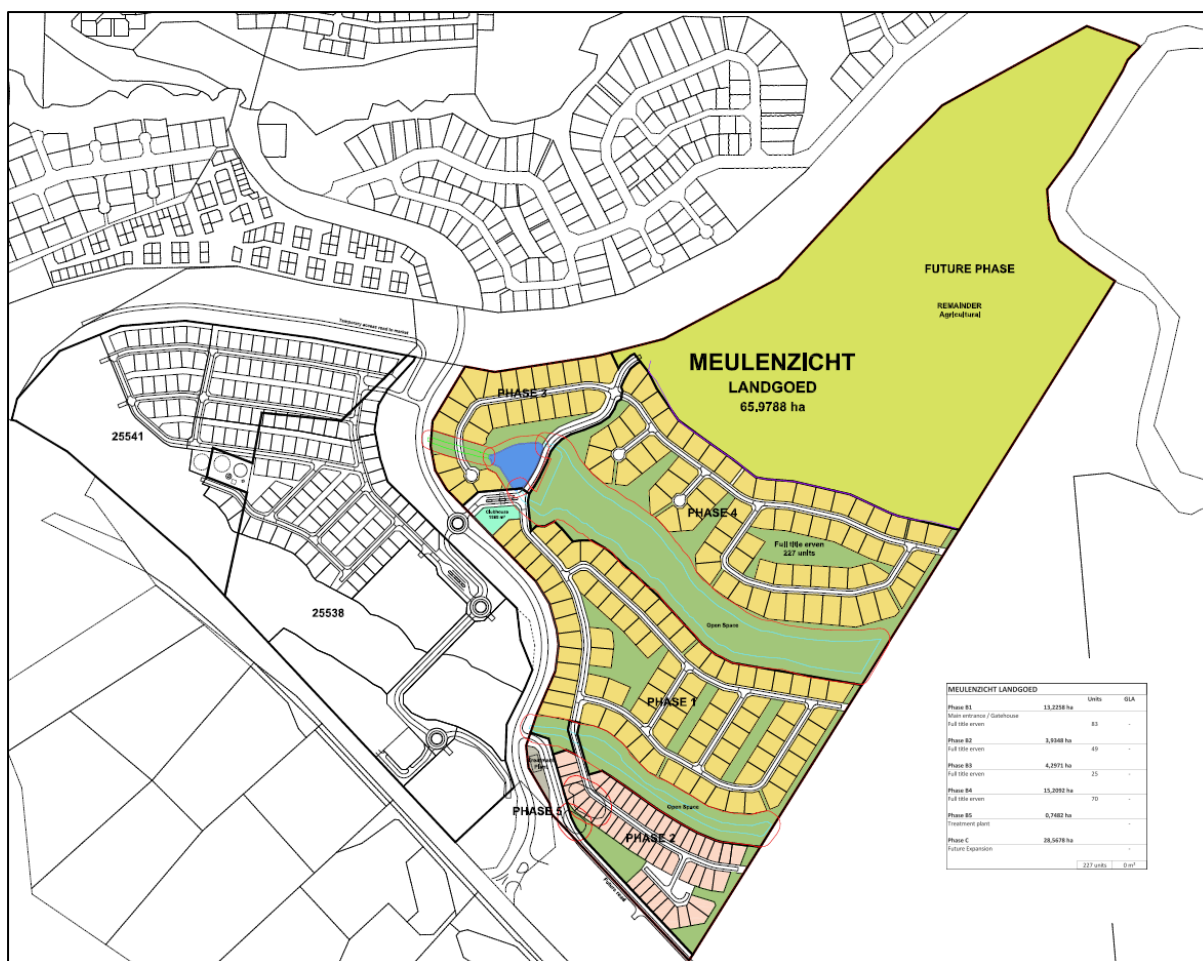


Figure 4: The latest site development plan (SDP) for Meulenzicht Landgoed.

3.1.1 Stormwater

- Limited stormwater detention/attenuation has been incorporated into the stormwater management plan and post-development flows for both estates will increase relative to pre-development flows (Table 2).

Table 2: Pre- and post-development runoff (m³/s) for Meulenzicht Landgoed (Lyners, 2025).

Return Interval	Meulenzicht	
	Pre	Post
2	0.94	1.58
5	1.36	2.02
10	1.98	2.89
20	2.52	3.40
50	4.20	5.09
100	6.47	6.15

- Discharge headwalls at the ends of pipes will be equipped with stilling basins and erosion protection to decrease storm water velocities, spread the flows and prevent erosion at the outlets (Figure 5). These headwall outlets discharge into the buffer of wetland areas and will not be constructed within the delineated area of any wetland.

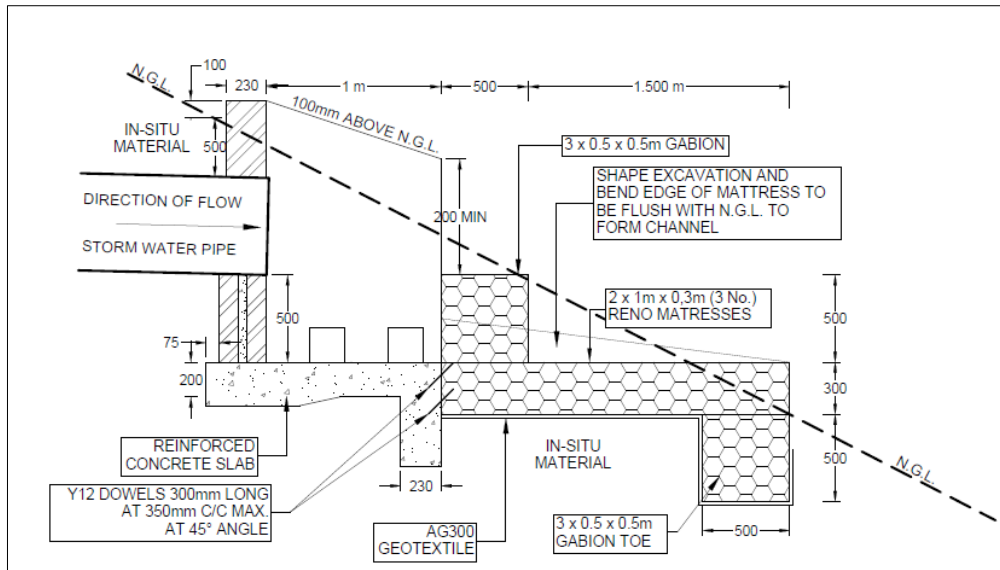


Figure 5: Section of proposed headwall outlets including stilling basins and erosion protection (Lyners, 2025).

3.1.2 Road Crossings

- Roads crossing watercourses will incorporate a 300 mm thick gabion reno mattress to a) achieve a stable roadbed and b) to allow baseflows to permeate through the crossing unimpeded. Culverts situated above the mattress will allow stormwater flows to pass through the crossing (Figure 6).

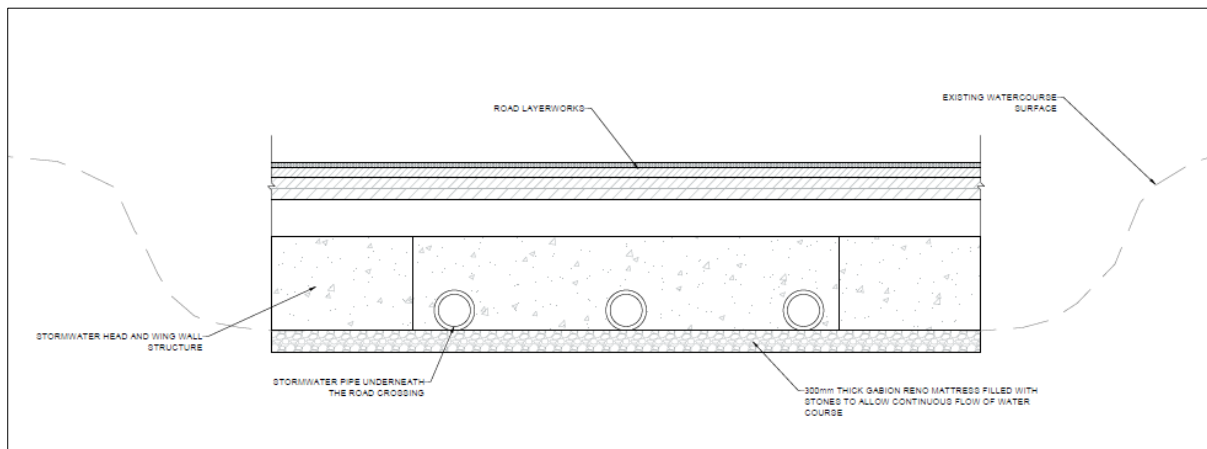


Figure 6: Typical detail of road stream crossing (Lyners, 2025).

3.1.3 Sewage

- The applicant will design, implement, operate and maintain a 360 kL on-site wastewater treatment package plant (Alveo Water Membrane Bioreactor) situated along the western perimeter of the Meulenzicht Landgoed.
- The internal sewer system will drain to localized small sewer pumpstations (5 in total located along the eastern perimeter of the development) that will pump to the proposed 360kL sewer package plant for wastewater treatment of the development.
- Sewer lines will cross several watercourses and will be buried beneath the bed of the watercourse and encased in concrete (Figure 7).

- The treated effluent will either be discharged into the W2 and reused for irrigation purposes on open green spaces.
- The wastewater will be treated to the Department of Water and Sanitation's General Discharge Limits (Table 3).

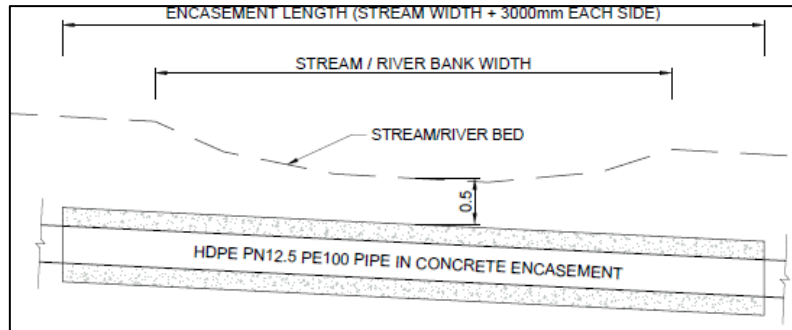


Figure 7: Longitudinal section of sewage pipelines crossing a watercourse (Lyners, 2025).

Table 3: 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)

4 REHABILITATION

Headcut erosion in the lower reaches of W3 must be rehabilitated to prevent any further erosion to the wetland. The following plan has been proposed:

- The rehabilitation work will consist of filling the donga with large rocks of size 300mm diameter below the stream bed (Figure 8).
- A layer of 300mm thick topsoil will be placed and compacted on top of the rock fill. A mixture of endemic, indigenous grass seeds will be placed in the topsoil layer to quickly establish vegetation and reduce the risk of future erosion. Additional wetland plant species that must be planted include the following:
 - *Cliffortia odorata*
 - *Helichrysum cymosum*
 - *Juncus effusus*
 - *Cyperus textilis*
 - *Nidorella ivifolia* (along the drier margins)
- Gabion structures will be placed along the rehabilitated area to reduce the stormwater flow velocity and to assist with sediment build up (Figure 9).

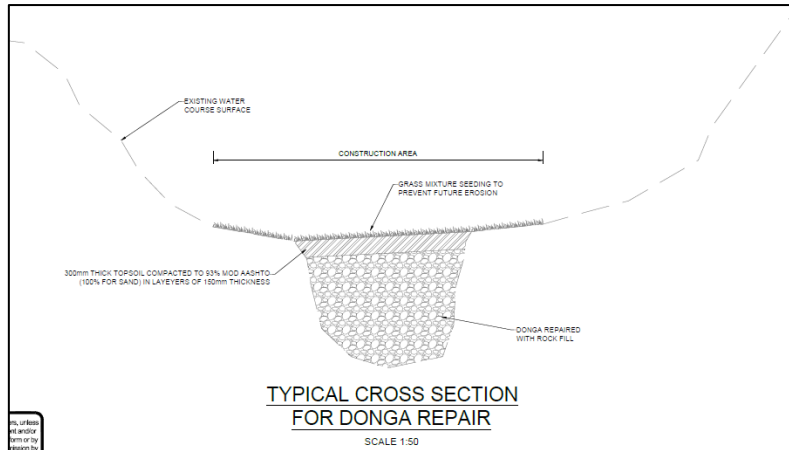


Figure 8: Cross-section of proposed rehabilitation works for W3.

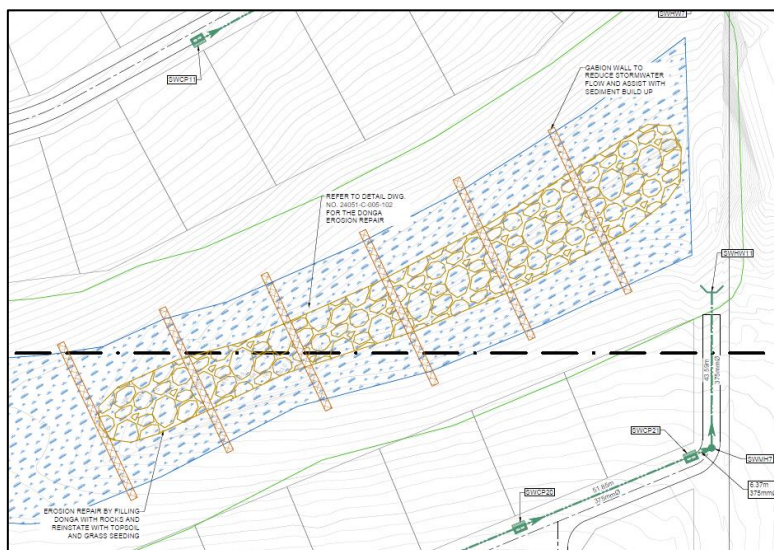


Figure 9: Plan view of the proposed rehabilitation works for W3.

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 (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 (f): Discharging waste or water containing waste into a water resource.
- Section 21 (i): Altering the bed, banks, course or characteristics of a watercourse.

Further details are provided in Table 1.

Table 4: List of water uses that will be included in the WULA

ID	Water Use	Description	Lat	Long
SO1	21 i	Stormwater Outlet	-33.98626	22.52159
SO2	21 i	Stormwater Outlet	-33.98666	22.5222
SO3	21 i	Stormwater Outlet	-33.98765	22.52316
SO4	21 i	Stormwater Outlet	-33.9883	22.52608
SO5	21 i	Stormwater Outlet	-33.98897	22.52564
SO6	21 i	Stormwater Outlet	-33.98834	22.52297
SO7	21 i	Stormwater Outlet	-33.98642	22.52017
SO8	21 i	Stormwater Outlet	-33.98614	22.52052
SO9	21 i	Stormwater Outlet	-33.98565	22.5206
SO10	21 i	Stormwater Outlet	-33.98588	22.51936
SO11	21 i	Stormwater Outlet	-33.98565	22.51914
SO12	21 i	Stormwater Outlet	-33.99027	22.52232
SO13	21 i	Stormwater Outlet	-33.99074	22.52417
SO14	21 i	Stormwater Outlet	-33.9912	22.52384
SO15	21 i	Stormwater Outlet	-33.98983	22.5205
RC1	21 c & i	Road Crossing	-33.98971	22.52094
Sewage Pac	21 c & i	Sewage Package Plant	-33.99007	22.5203
Effluent	21 f	Effluent Discharge	-33.98976	22.5205
Irrigation	21 e	Irrigation	-33.98888	22.522
Res South	21 c & i	Residential Development	-33.99081	22.5221
Res Cen	21 c & i	Residential Development	-33.98903	22.5224
Res North	21 c & i	Residential Development	-33.9868	22.52348
FSPS1	21 c & i	Sewage Pump Station	-33.98674	22.52727
FSPS2	21 c & i	Sewage Pump Station	-33.98802	22.52633
FSPS3	21 c & i	Sewage Pump Station	-33.98898	22.52559
FSPS4	21 c & i	Sewage Pump Station	-33.99079	22.52414
FSPS5	21 c & i	Sewage Pump Station	-33.99115	22.52382
SL Cross1	21 c & i	Sewage Line Crossing	-33.98864	22.52582
SL Cross2	21 c & i	Sewage Line Crossing	-33.99097	22.524
SL Cross3	21 c & i	Sewage Line Crossing	-33.98579	22.51954
SL Cross4	21 c & i	Sewage Line Crossing	-33.98566	22.51903
Gab Rehab1	21 c & i	Gabion	-33.98862	22.52546
Gab Rehab2	21 c & i	Gabion	-33.98861	22.52526
Gab Rehab3	21 c & i	Gabion	-33.98859	22.52507
Gab Rehab4	21 c & i	Gabion	-33.98858	22.52488
Gab Rehab5	21 c & i	Gabion	-33.98857	22.52471
Gab Rehab6	21 c & i	Gabion	-33.98856	22.52448

6 IMPACTS & MITIGATION

6.1 Layout & Design Phase

Certain aspects of the development require careful consideration prior to construction so as to minimise impacts during the operational phase. This is most relevant for the design of road crossings and stormwater infrastructure.

Impact 1: Alteration of hydrogeomorphological characteristics caused by constriction of flow at road crossings

Road crossings alter flow hydrodynamics and can impact the natural hydrogeomorphological attributes of a watercourse. Culverts are incorporated into the design to allow surface flows beneath the road. Culverts can result in the constriction of flow which could:

- a) Create a barrier to flow and sediment transport, which can potentially lead to inundation of habitat upstream of the road, leading to formation of permanently saturated and inundated areas
- b) Lead to more concentrated flow downstream of the road crossing, leading to scouring, erosion incision of the channel.
- c) Lead to erosion around culvert and wash out of the road.

	Without Mitigation	With Mitigation
Intensity	High	Moderate
Duration	Ongoing	Ongoing
Extent	Limited	Very limited
Probability	Almost certain	Unlikely
Significance	-78: Moderate	-33: Negligible
Reversibility	Medium	High
Irreplaceability	Medium	Low
Confidence	High	High

Mitigation:

- Crossings must facilitate free flow of surface and subsurface water and no ponding or inundation of wetland habitat must occur upstream of road crossings;
- Culverts beneath road crossings must be appropriately sized (i.e. must be sized according to the natural width of the channel) and must not result in concentrated, high energy flow downstream of the crossing. Stormwater flows must not be channelled to a narrower section of the channel. In this respect box culverts are recommended.
- Stream bed and bank protection must be incorporated below road crossings.

Impact 2: Channel erosion and incision caused by increased stormwater inputs into wetlands.

The scale of the development and the associated increase in area of impervious surfaces (roads, building etc.) will result in the generation of significant volumes of stormwater. Energy dissipation and erosion protection has been incorporated into the design of stormwater headwall outlets to prevent erosion at outlets.

Additional stormwater input into each of the wetlands will increase flow rates and flood peaks which can lead to erosion of the bed and banks and channel incision. This is a common problem in urban rivers and wetlands throughout George and the severe effects of stormwater on the ecological condition of watercourses is already evident in W3. High rates of erosion in the catchment area also

affect sensitive downstream habitat. In this respect the Kaaimans Estuary is under increasing pressure from urban developments in the Swart River catchment area.

Post development stormwater runoff is expected to increase and represents a Very High intensity of impact to water resources within the development area and to the Kaaimans Estuary. While energy dissipation at headwall outlets can mitigate against erosion of the embankments (at the point of discharge) – accumulated flow volumes within the channel will have a high likelihood of eroding and incising the channel of watercourses. This impact can only be mitigated by implementing Sustainable Drainage Systems (SuDS) on site aimed at encouraging attenuation and infiltration of water within the development prior to discharge into watercourses.

	Without Mitigation	With Mitigation
Intensity	Very High	Moderate
Duration	Ongoing	Ongoing
Extent	Local	Limited
Probability	Almost Certain	Probably
Significance	-90: Moderate	-48: Minor
Reversibility	Medium	High
Irreplaceability	Medium	Low
Confidence	High	High

Mitigation::

- Implementation of additional SuDS measures is required to attenuate stormwater onsite and reduce stormwater impacts to an appropriate level. It is recommended that the stormwater management plan for the development should align with the City of Cape Town urban stormwater impacts policy which requires 24 hour extended detention of the 1-year return interval, 24-hour storm event. In addition to rainwater harvesting (which will be implemented as part of the stormwater management plan) the following must, *inter alia*, be considered:
 - Swales and detention ponds can be incorporated into the open space network 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.
- The headcut erosion in W3 must be rehabilitated according to the plan prescribed in Section **Error! Reference source not found.** to prevent any further loss of wetland habitat. The following mitigation measures must be implemented during rehabilitation:
 - A single access point must be utilised to access the rehabilitation area;
 - Rehabilitation must be planned for the dry season to minimise the potential for floods to flow through the rehabilitation area during construction;
 - The filled area must ensure a continuous streambed profile with no sudden drops in elevation;
- The rehabilitated area must be inspected at least once a month and after any rainfall event exceeding 10 mm. Any signs of erosion must be addressed immediately.

Impact 3: Loss of wetland habitat due to construction of built infrastructure.

Transformation of wetland habitat is limited to road crossings. All other infrastructure will be located outside of the delineated area of each wetland or will be limited to a temporary disturbance (i.e.

installation of sewage pipelines crossing wetlands). Apart from the access road to Phase A8, all infrastructure will be located outside of the designated buffer area.

	Without Mitigation	With Mitigation
Intensity	Low	Very Low
Duration	Permanent	Permanent
Extent	Very Limited	Very limited
Probability	Likely	Unlikely
Significance	-50: Minor	-30: Negligible
Reversibility	High	High
Irreplaceability	Low	Low
Confidence	High	High

Mitigation:

- Recommended buffers for each wetland 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.
- The access road to Phase A8 must remain outside of the delineated area of the wetland.
- Buffer areas must not be converted to lawns and must not be mowed.
- Indigenous vegetation must be allowed to re-establish within buffer areas and an alien invasive plant management plan must be drafted and implemented to control alien plant species in buffers and in delineated wetland areas.

6.2 Construction Phase

Impact 4: Erosion and sedimentation of wetland habitat caused by clearance of the site.

Clearance of vegetation to commence with construction of buildings and roads will expose bare soil which can erode and cause sedimentation of watercourses. This impact is particularly relevant for W2 to W4 which are located at the base of, or along steep slopes.

	Without Mitigation	With Mitigation
Intensity	High	Low
Duration	Short term	Brief
Extent	Limited	Limited
Probability	Almost Certain	Probably
Significance	-60: Minor	-28: Negligible
Reversibility	High	High
Irreplaceability	Low	Low
Confidence	High	High

Mitigation:

- 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 the contour below the development footprint.
- 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.
- Stockpiling must take place outside of the wetland areas and associated buffers. All stockpiles must be protected from erosion, surrounded by bunds and stored on flat areas where run-off will be minimised; and
- Recommended buffers for each wetland 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.



Figure 10: Examples of silt fences (left) and coir logs (right) used to trap sediment mobilised from steep slopes.

Impact 5: Disturbance and pollution of wetland habitat caused by construction activities.

The site is large and will result in the construction of a variety of infrastructure, including residential units, internal roads, sewage infrastructure, stormwater infrastructure, water reticulation network etc. This will result in high numbers of vehicles and construction workers on site and high quantities of construction materials brought onto the site. Laydown areas and stockpiles of construction materials and excavated topsoil will be required. Poor management of construction activities on site can result in physical disturbance of aquatic habitat and pollution through leaks and spills of hydrocarbons (i.e. fuel and oil from construction vehicles and machinery, bitumen for road surfacing etc.) and other construction materials (e.g. cement, paint etc.) The cumulative intensity of impact of these activities on wetland and river habitat can be significant.

	Without Mitigation	With Mitigation
Intensity	High	Low
Duration	Medium Term	Short Term
Extent	Limited	Limited
Probability	Likely	Unlikely
Significance	-55: Minor	-24: Negligible
Reversibility	High	High
Irreplaceability	Medium	Low
Confidence	High	High
Mitigation:		

- Recommended buffers for each wetland 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;
- 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;
- No dumping of construction material on-site may take place;
- An alien invasive plant management plan needs to be compiled and implemented post construction to prevent the growth of invasives on cleared areas

Impact 6: Disturbance of habitat caused by the construction of sewer pipelines and stormwater infrastructure.

Sewage pipelines will run along low points immediately adjacent and across wetlands. While the wetlands are moderately to largely modified, it is important that construction of these linear structures is planned so that the hydro-functional attributes of the wetlands is maintained.

	Without Mitigation	With Mitigation
Intensity	High	Moderate
Duration	Medium Term	Brief
Extent	Limited	Very Limited
Probability	Certain	Certain
Significance	-77: Moderate	-49: Minor
Reversibility	High	High
Irreplaceability	Low	Low
Confidence	High	High

Mitigation:

- Recommended buffers for each wetland must be clearly demarcated and indicated as No-Go areas. Apart from pipelines crossing watercourses, all pipelines must remain outside of designated buffer areas.
- The location and alignment of all proposed infrastructure crossing wetlands must be clearly demarcated prior to the start of construction activities so as to minimise unnecessary impacts to wetland habitat;

- Soil excavated for the trench for the stormwater and sewage pipelines must be stockpiled along the outer edge of the trench furthest away from the wetland. Topsoil must be separated from subsoil and stockpiled separately;
- The trench must be filled (first with subsoil and then with topsoil) and reshaped to original contours such that no preferential flow paths are created;
- The backfilled trench and any other disturbed areas must be re-vegetated using an appropriate indigenous fynbos grassland mix. Temporary erosion control must be placed along the trench alignment until such time as vegetation has re-established;
- Cement/concrete used in the construction must not be mixed on bare ground or within the wetland or buffer area. An impermeable/bunded area must be established in such a way that cement slurry, runoff and cement water will be contained and will not flow into the surrounding environment, the stream or riparian zone or contaminate the soil;
- The watercourse must be inspected on a regular basis (at least weekly) by an appropriately qualified ECO for signs of disturbance, sedimentation and pollution during the construction phase. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures; and
- Disturbed areas must be kept clear of alien vegetation and must be actively reshaped to natural contours and rehabilitated with indigenous, local vegetation.

Impact 7: Closure of offstream dams on aquatic biodiversity

The two offstream dams located towards the south of the development are planned to be closed. While these dams are aesthetically attractive features that provide habitat for limited bird species and aquatic biota, their closure is not considered a major loss of aquatic biodiversity.

	Without Mitigation	With Mitigation
Intensity	Low	Very Low
Duration	Brief	Brief
Extent	Very Limited	Very Limited
Probability	Certain	Certain
Significance	-42: Minor	-35: Negligible
Reversibility	High	High
Irreplaceability	Low	Low
Confidence	High	High

Mitigation:

- An opening in the wall of the dams must be made to allow water to slowly exit the dam in a controlled manner. This is to allow any aquatic biota (especially amphibians) to migrate from the dam prior to infilling.
- The dams must ideally be emptied during the winter season (from May to September outside of the breeding season for most biota) at least 3 weeks prior to infilling the dams.
- A survey of fish species occurring in the dams is recommended. Alien invasive or extra-limital indigenous fish species must not be translocated to alternative natural or artificial habitats and must be euthanised using appropriate ethical methods.

6.3 Operational Phase

Impact 8: Impairment of water quality caused by increased stormwater inputs.

Vehicles, gardens and maintenance activities will result in increased runoff of fertilizers, pesticides and hydrocarbons. Intentional disposal of chemicals and other household products (e.g. paint) into the stormwater intentionally discarded into stormwater drains can also have a significant effect on water quality. Implementation of a SuDS principles can mitigate this impact through increased attenuation and filtration of pollutants on site (prior to discharge into the environment).

	Without Mitigation	With Mitigation
Intensity	Moderate	Low
Duration	Ongoing	Ongoing
Extent	Limited	Limited
Probability	Almost certain	Probably
Significance	-72: Minor	-44: Minor
Reversibility	High	High
Irreplaceability	Low	Low
Confidence	High	High

Mitigation:

- Implementation of SuDS as recommended for Impact 2 will also help to improve water quality.
- Guidelines for residents must be drawn up that prohibit dumping of hazardous materials into stormwater drains.

Impact 9: Impairment of water quality caused by discharge of treated sewage effluent into W2

Treated effluent will be discharged into W2, which joins the Swart River and ultimately the Kaaimans Estuary. Flows in the Swart River are highly regulated due to the Garden Route Dam and dilution capacity in the Swart River is therefore reduced. Data on flows in the Swart River were not available at the time of compiling this report. The impact of effluent discharge from the package plant on water quality in the Swart River is dependent on the dilution capacity of the Swart River. This in turn is dependent on the volumes of water that are released from the Garden Route Dam in order to satisfy the reserve of the Swart River and Kaaimans Estuary. It is likely that some assimilation of pollutants will occur along W2 and further downstream after the confluence with W3. The ability of these wetland systems to assimilate pollutants is however dependent on maintaining their existing hydro-functional attributes.

The most serious impacts are generally associated with leaks due to blocked pipelines, malfunctioning pump stations or operational problems at the package plant. Monitoring and maintenance of the package plant and associated infrastructure (pump stations in particular) are essential to ensuring that impacts are mitigated to an appropriate level.

	Without Mitigation	With Mitigation
Intensity	Very High	High
Duration	Ongoing	Ongoing
Extent	Municipal Area	Municipal Area
Probability	Likely	Likely
Significance	-80: Moderate	-75: Moderate
Reversibility	High	High
Irreplaceability	Low	Low

Confidence	Low	Low
<p>Mitigation:</p> <ul style="list-style-type: none"> • Re-use of treated wastewater (e.g. for irrigation of landscaped areas and open space areas) must be prioritised so as to minimise discharge of wastewater into the watercourse; • The efficacy of the WWTP will rely on routine maintenance. A maintenance schedule for the package plant must be drafted and implemented; • A signed service level agreement between the developer and a qualified service provider must be provided as a condition of authorisation; • On-site operator must be thoroughly trained by the service provider and must be monitored in the operation of the plant for the first 3 months; • A water quality monitoring plan must be compiled and must include the following: <ul style="list-style-type: none"> ○ Monitoring and analysis of treated effluent (prior to discharge into the watercourse) for all water quality parameters specified in the General Limit must be performed weekly during the first 3 months in order to ensure the plant is functioning optimally. Thereafter samples must be collected and analysed every two weeks. ○ TSS and pH must be measured at the effluent outlet daily using a calibrated handheld water quality meter. Any variations beyond the General Limit must be used to prompt an immediate response and appropriate corrective measures. ○ All water quality parameters specified in the General Limit must be analysed in a sample collected directly from W3. Samples must be collected at the lower end of W3 near the eastern perimeter of the property. • Pump Stations: <ul style="list-style-type: none"> ○ All pump stations must be inspected every second week for any signs of leaks or failure. A register of inspections and the status of each pump station must be maintained; ○ A contingency plan for load-shedding must be included in the design of the sewage network. Alternatively, each pump station must be provided with emergency storage to cater for a 4-hour power interruption; and ○ A maintenance plan for all pump stations must be drafted and implemented. • Service level agreements, monitoring and maintenance plans must be audited on an annual basis. 		

6.4 Cumulative Impacts

Impact 10: Deterioration in water quality caused by increased stormwater flows and sewage infrastructure.

Cumulative impacts are primarily related to increased stormwater flows, sediment delivery and water quality deterioration in the Swart River catchment due to rapidly expanding high density developments in the catchment area. While the Swart River is relatively degraded, it does discharge into the Kaaimans Estuary which is considered Largely Natural (PES B). The cumulative impacts of development in the Swart River catchment are significant and pose a serious risk to the ecological health of the Kaaimans Estuary and to recreational users of the estuary. An example of this can be observed in Figure 11, which shows highly turbid water from the Swart River mixing with the Kaaimans Estuary during a high rainfall event.



Figure 11: Photograph showing highly turbid water from the Swart River mixing with the Kaaimans Estuary during a flood event in November 2023 (Photo: J. Dabrowski).

	Without Mitigation	With Mitigation
Intensity	High	Moderate
Duration	Ongoing	Ongoing
Extent	Municipal Area	Municipal Area
Probability	Certain	Probably
Significance	-105: Moderate	-56: Minor
Reversibility	Medium	High
Irreplaceability	Medium	Low
Confidence	High	High

Mitigation:

- Developments in the catchment area must incorporate SuDS as part of the stormwater management plan. It is recommended that plans should align with the City of Cape Town urban stormwater impacts policy which requires 24 hour extended detention of the 1-year return interval, 24-hour storm event;
- The assimilative capacity of the Swart River must be determined (taking flow releases from the Garden Route Dam into account) to determine whether effluent discharge can be adequately diluted.

7 REPORTS AND OTHER TECHNICAL DOCUMENTS

Table 5: Additional technical reports relevant to application

Technical documents	Compiled by	Date compiled
Appendix 1 - Freshwater Assessment Report	Confluent Environmental	February 2025
Appendix 2 - C24015G – Technical Report for Engineering Services	Lyners Consulting Engineers & Project Managers	December 2024
Appendix 3 - C24015G – Stormwater Management Plan	Lyners Consulting Engineers & Project Managers	December 2024