CLANWILLIAM HOUSING DEVELOPMENT AND WWTW EXPANSION ON A PORTION OF REMAINDER OF ERF 279, CLANWILLIAM

SECOND DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT
DEA&DP: REF. NO. 16/3/3/2/F2/4/2021/25.

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EXECUTIVE SUMMARY

PREFERRED

Cederberg Municipality for the Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:

Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 126 Single Residential Zone 1 erven - Average erf size: ±208m²
- 692 Single Residential Zone 2 erven - Average erf size: ±150m²
- 13 Open Space Zone 1 erven
- 5 Community Zone II (church) erven
- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT

- 459 Single Residential Zone II erven - Average erf size: ±120m²
- 4 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day.

With a total Development footprint of ±49.6ha

ALTERNATIVE

PROPOSED ACTIVITY DESCRIPTION

Cederberg Municipality for the Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:

Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 160 Single Residential Zone 1 erven - Average erf size: ±208m²
- 692 Single Residential Zone 2 erven - Average erf size: ±150m²
- 13 Open Space Zone 1 erven
- 5 Community Zone II (church) erven
- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT
- 457 Single Residential Zone II erven - Average erf size: ±120m²
- 2 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. The upgrade comprises refurbishment of the existing equipment, a lined night storage pond, a new 1.5 Ml/day activated sludge reactor and clarifier, and a new chlorine contact tank, giving a new rated treatment capacity of 3 600 m³/day, with the works intended to treat at least 3 600 m³/day on a constant basis during peak conditions. The night storage pond (about 1 500 m³) holds peak flows for treatment during off-peak periods; BVi (2024) refers to it as a 500 m³/day short-term increase in capacity, but it does not add treatment capacity. It is designed to meet the Special Limit Values, including COD below 30 mg/l, ammonia below 2 mg/l and phosphate below 1 mg/l (BVi, 2024).

With a total Development footprint of ±49.6ha

Water Services
The existing water reticulation system of the Cederville reservoir water distribution zone has insufficient capacity to accommodate the proposed development.
Network upgrade
- Item 1 – 190m x 200mm diameter; replace existing 160mm pipe
- Item 2 – 90m x 160m diameter; replace existing 75mm pipe
- Item 3 – 285m x 160mm diameter internal water pipes
- Item 4 – 550mm x 160mm diameter internal water pipes
- CCIW2.1 – 220m x 315mm new supply pipe
- CCIW2.2 – 320m x 315mm; replace existing 75mm pipe
- CCIW2.3 – 260m x 315mm; replace existing 75mm pipe
- CCIW2.6 – 190m x 110mm new supply pipe

Reservoir
- CCIW.B1: 3 000 kL additional storage capacity for Cederville reservoir site
- CCIW.B12: 90 m x 315 mm Ø New feeder pipe to Cederville no. 2 reservoir
- CCIW.B16: 90 m x 315 mm Ø link pipe between Cederville no. 1 & 2 reservoirs
- CCIW.B17: 5 m x 160 mm Ø inter-connection pipe between 2x bulk pipes

Sewer Services
- CCIS6.1 – 380 m x 450 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS6.2 – 950 m x 200 mm Ø Upgrade existing 160 mm Ø outfall sewer
- CCIS6.3 – 475 m x 525 mm Ø Upgrade existing 150 mm Ø bulk sewer
- CCIS2.2 – 370 m x 200 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS2.3 – Upgrade capacity of Milner Street PS to 55 L/s
- CCIS2.4 – 780 m x 315 mm Ø Upgrade existing 200 mm Ø rising main
- CCIS4.1 – 260 m x 200 mm Ø New outfall sewer
- CCIS4.2 – 270 m x 250 mm Ø New outfall sewer

- CCIS4.3 – 350 m x 200 mm Ø New outfall sewer
- CCIS4.4 – New 20 L/s Future PS Cl2
- CCIS4.5 – 1 005 m x 160 mm Ø New rising main

For the development of Area A the following upgrades are required:

- Master plan items CCIS6.2 & CCIS6.3 to reinforce the capacity of the existing gravity system
- between the proposed development and the Clanwilliam WWTP.
- Link services items CCIS4.1 & CCIS4.2 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.
- A small portion of the development drains towards the existing Milner Street PS, which discharges into the Clanwilliam Gravity drainage areas. The bulk sewer downstream of the Milner Street PS is at capacity and should be upgraded (master plan items CCIS6.1 & CCIS6.3).
- The existing Milner Street PS drainage area has spare capacity to accommodate the erven within development area A which drains towards the Milner Street PS. In the sewer master plan for Clanwilliam upgrading of the Milner Street PS and accommodating rising main is however proposed (refer to master plan items CCIS2.3 & CCIS2.4), as well as upgrading of the main outfall sewer gravitating toward the Milner Street PS (refer to master plan item CCIS2.2). It can be considered to upgrade the PS, rising main and outfall sewer (master plan items CCIS2.2, CCIS2.3 & CCIS2.4) as part of the construction of the development as these items runs through the development area.

For the development of Area B the following upgrades are required:

- Link services items CCIS4.2 & CCIS4.3 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.

Stormwater

An underground piped stormwater system will be provided to accommodate for the minor storm events (up to RI 1: 5 years). The major storm events will be accommodated within the street reserves. Stormwater run-off will be channelled to the existing Jan Dissels River flowing to the east of the proposed development using existing non-perennial river after it was detained and controlled released on an open space erf specifically created for stormwater control inside the development. Six other outlets on the eastern side will be constructed where stormwater pipe outlets will release stormwater next to roads and infrastructure. The degraded wetland on the western side and north of the WWTW with its greater open space area will be used to collect the existing stormwater released from the development on the western edge and other generated stormwater on the development. Building rubble and litter, as well as alien invasive trees will be controlled and eradicated from this area.

The stormwater infrastructure, comprising 21 headwalls, four attenuation ponds and a piped connection within the central valley-bottom wetland system, and the refurbishment and expansion of the WWTW, with a new 1.5 Ml/day module and the upgraded works intended to treat at least 3.6 Ml/day at peak, were assessed. With mitigation, the construction impacts and the operational impacts of the stormwater system are of Low significance. Combined with the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026), the stormwater design offers an opportunity to improve the central wetland, which currently receives untreated stormwater from the informal settlement and township.

Stormwater will be collected by kerb inlets and underground pipes designed for the 1:5-year event, with larger events conveyed in the road reserves, and discharged through headwalls into

the retained wetland system and towards the Jan Dissels River (UDS Africa, 2026b; Enviro-EAP, 2026) (**Figure 2-2**). The conceptual layout showed 10 headwalls, most discharging towards the Jan Dissels River, two directly into the wetland and two upstream of it (UDS Africa, 2026a). The tender-stage layout has 21 numbered headwalls, with design discharges of 17 to 843 l/s through 375 to 750 mm pipes, and four attenuation ponds (Ponds 1, 2, 6 and 7) (UDS Africa, 2026b). Overflow from Wetland 1 to Wetland 2 (both form part of the unchannelled valley-bottom wetland system) will be piped beneath the golf course.
The ponds were sized with the Abt and Grigg method to attenuate the 1:100-year peak inflow to the post- development 1:2-year flood peak (UDS Africa, 2026b). Pond 7, the largest, provides 4 853 m³ of storage against 2 913 m³ required and reduces a 1:100-year inflow of 5 863 l/s to 209 l/s. Pond 1's designed outflow (417 l/s) is marginally above its allowable rate (410 l/s). Each pond outlet is a field inlet or headwall with an open top for emergency overflow.

Roads
Access to the proposed development will be provided from the existing Bloekom Avenue, south of the proposed development, Denne and Buitekant Street to the west and from Oranje, Protea and Viooltjie Streets to the north. The internal roads (main access road 16m wide and other internal roads 10m wide) will consist of surfaced streets.

Terrestrial Biodiversity

CONCLUSION AND RECOMMENDATIONS
The sampling and analysis of the site, provides suitable data and results to present an informed decision on the local ecology and terrestrial biodiversity features. The lists of species for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach. During the site visits, the different biodiversity features, habitat, vegetation and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and species observed were recorded. Searches for listed species of conservation concern at the site were conducted, but none were observed which required the recording of their location. The study recorded low and very low sensitivity areas within the development area. No terrestrial CBA or ESA were mapped on the impact area.

Please refer to the Aquatic Biodiversity assessment for more detail on the mapped Freshwater ecologic features and buffers with management and mitigation measures to protect them. Included in the Environmental Management Plan is management and mitigation measures too protect the groundwater resources.

No additional survey or further assessment is in the authors view recommended.

The proposed area as per the Site Development Plan will have relatively little terrestrial biodiversity and ecological impact on sensitivity areas and the surrounding terrestrial biodiversity features provided that the development stays within the Site Development Plan area and appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to.

Aquatic Biodiversity

CONCLUSION AND RECOMMENDATIONS

Enviro-EAP (Pty) Ltd was appointed to undertake a Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) analysis of the freshwater and riparian resources.

A site development plan layout amendment is required. The valley bottom wetland east of the development and golf course must be protected by a 15m wide buffer. In order to achieve this, the layout must be amended and the sewerage pipeline and pump station associated with an access road must be removed from the Site Development Plan in order to protect it. This will ensure that the development is appropriate and will not affect the status of the aquatic biodiversity features identified on site as a result of existing disturbances to the non-perennial river. Rehabilitation of the wetland by attending to alien invasive plant clearing and removal of litter and building rubble inside the wetland and creating of buffer around wetland of at least 15m, except for the GAP housing portion on the north and northeast of the wetland will protect the one wetland mapped. Creating stormwater detention after culvert before stormwater is released into the existing drainage line and valley bottom wetland releasing stormwater on site into the Jan Dissels River will protect the downstream valley bottom wetland. Rehabilitation of the existing stormwater pond by reshaping it and removal of alien invasive plants in the upper section of the valley bottom wetland and drainage line where into the discharged stormwater from the bigger wetland will be discharged before detained in on site stormwater pond on specially created open space erf in the development footprint will protect the valley bottom wetland and stormwater discharged into the Jan Dissels river.
No Freshwater Ecosystem Priority Area (FEPA) was mapped which confirmed the low impact.

The peer review has identified a number of short-comings in terms of alignment with best practice in the field of aquatic biodiversity assessment. These are what EnviroSwift believes to be an incorrect classification of the on-site aquatic feature as a drainage line whereas it is in fact a wetland. This was corrected in this peer review report and as identified assessed as a valley bottom wetland. When assessed in terms of compliance with the gazetted Protocol for Aquatic Biodiversity Assessment the report is found to have the following critical flaws:

- Drawings such as an SDP that show the extent of the development and whether any aquatic features are being retained were absent in the Enviro-EAP Aquatic Biodiversity Assessment report. This was corrected and included as figure 2.
- Failure to consult the WCBSP (2023) as this would have confirmed the provincial biodiversity conservation importance of the downstream, receiving aquatic features (indicated as an Aquatic CBA). When the report was drafted, the 2017 WCBSP was applicable. It was however updated in this report to the 2023 version and the Aquatic ESA mapped on the assessment area was corrected in this report.
- Lack of proof of the methods used to classify and delineate the on-site freshwater features such as auger results. Had auger samples been taken within the feature, the lack of evidence of alluvial processes would have been identified and the feature correctly identified as a wetland. The auger sampling and delineations done by EnviroSwift was used to update this peer reviewed report.
- Failure to recommend the minimum buffer width; and. The recommended 15m buffer, except for the GAP housing areas in north and north east of the wetland was accommodated in the SDP. Furthermore, the SDP was amended and the road, stormwater pipe and sewerage pipeline on the downstream wetland east of the golf course was removed from the site development plan. An open space erf was created in the layout to accommodate a stormwater detention pond before stormwater is discharged into this wetland system. A 15 buffer area is therefore not required in this section as the development infrastructure and roads was removed from the preferred layout.
- Failure to present a reasoned authorisation opinion based on a thorough evaluation of the assessment criteria that comprises an Aquatic Biodiversity Assessment. This was corrected in the updated peer review report.

Aquatic Biodiversity Impact Assessment Addendum_Clanwilliam Housing and WWTW V1.0

Van Zyl, K. and Morton, R. 2026. Aquatic Biodiversity Impact Assessment Addendum:

Stormwater Management and WWTW Expansion, Clanwilliam Housing Development, Remainder Erf 279, Clanwilliam V1.0. Delta Ecology. RSA.
The wetland systems associated with the proposed Clanwilliam Housing Development are seriously modified (PES E). The central valley bottom wetland system currently receives substantial volumes of polluted stormwater, and possibly sewage, from the informal settlement and township upslope, which flow through the wetland and on to the Jan Dissels River untreated to a large degree. The southern seep wetland currently receives treated (and for many years untreated) effluent from the WWTW. Water quality sampling showed that the Jan Dissels River downstream of the works is strongly influenced by treated effluent, with ammonia at levels likely to cause chronic toxicity to sensitive aquatic biota, eutrophic nitrogen concentrations and increased E. coli.

The proposed stormwater design, combined with the rehabilitation of the central valley bottom wetland system, is supported, mainly because the water flowing from the wetland system to the Jan Dissels River is expected to be of better quality with formalized stormwater treatment than it is at present. This depends on the stormwater from both the new development and the existing settlement being treated before it enters the wetland, on peak flows being attenuated to pre-development levels, on outlets and ponds being placed outside the wetland and discharging diffusely, and on the system being maintained and the Wetland Rehabilitation and Management Plan being implemented.

The refurbishment and upgrade of the WWTW aim to treat the effluent to the Special Limit Values. They are expected to improve the quality of treated effluent reaching the Jan Dissels River compared with the long record of non-compliance at the works, and are supported and encouraged. Without mitigation, the effluent quality impact of the expanded works is of High significance. However, given the history of non-compliance, and because the additional capacity will need additional operational support, the impact of effluent quality to the Jan Dissels River remains of Medium significance after mitigation. Compliance must be secured through a specialist process engineer, a dedicated works manager and regular effluent monitoring. The increased discharge will also alter the flow in the river from the current status quo. This reach of the Jan Dissels River is already affected by the abstraction of potable water for the town upstream of the effluent release, and its floodplain downstream of the abstraction point has dried out, and the growth of the town that the expansion provides for over the next 15 years is likely to require additional abstraction. Downstream of the works the river is not natural: it flows past the town and through farmland for about 4.7 km before joining the Olifants River. These factors moderate the significance of the change in flow. The Olifants River, which the Jan Dissels joins about 4.7 km downstream of the release, is regulated by Clanwilliam Dam and is unlikely to be measurably affected in flow, although some water quality impairment is possible.

Two separate quantities need to be considered: the treated effluent generated by the housing development itself, estimated at about 640 m³/day, and the full 1.5 Ml/day expansion of the works, which provides for the growth of the town. These are assessed separately as Impacts 8a and 8b. After mitigation, the housing development's share is of Low significance, because it is small, only part of it is likely to reach the river while effluent continues to be reused for irrigation, and the lower river is already affected by

abstraction. The full expansion remains of Medium significance on a precautionary basis, because it is larger and increases progressively, and without a water balance and current flow data the proportion reaching the river cannot be reliably quantified. Given the extent of abstraction, the additional discharge could be seen as partly offsetting the existing dry-season flow deficit in the lower Jan Dissels River (Van der Berg, 2008), but this cannot be confirmed without current flow and abstraction data, and the quality of that water remains the main concern. The southern seep, which has received effluent for many years, is likely to expand as the volume increases, but this is of Low significance, given the degree of disturbance it already exhibits (hydrology and water quality critically modified, PES E). A water balance would show how much of each reaches the river, but it was not available for this assessment, so the change in flow has been assessed using a conservative upper-bound scenario. If DWS require a hydrological assessment for the expansion of the WWTW, this report may need to be updated.

It is the opinion of the specialist that the proposed Clanwilliam Housing Development, including its stormwater infrastructure and the associated refurbishment and expansion of the Clanwilliam WWTW, is acceptable from an aquatic biodiversity perspective and may be authorised. This is on condition that the mitigation measures in Section 6 are implemented and that the upgraded WWTW consistently meets the Special Limit Values for discharge to the Jan Dissels River.

The development will formalise housing for residents of the existing informal settlement, whose untreated stormwater, waste and possibly sewage currently drain into the central valley-bottom wetland system and on to the Jan Dissels River. Formal services, the treatment of stormwater from both the new development and the existing settlement, and the rehabilitation of the wetland offer a real opportunity to improve the condition of the wetland and the quality of water reaching the river. The refurbishment and upgrade of the WWTW, which has a long record of non-compliance, is likewise necessary, and is expected to improve the quality of the effluent reaching the Jan Dissels River compared with the status quo. Neither benefit is assured, however. The quality of treated effluent reaching the Jan Dissels River and the change in flow from the full expansion of the works remain of Medium significance after mitigation, and the river downstream of the works is already strongly influenced by effluent. Careful implementation of the recommended mitigation, monitoring and oversight is therefore essential. The following should be conditions of the environmental authorisation and the water use licence:

- The upgraded WWTW must be operated to meet the Special Limit Values (GN 665 of 2013) for discharge to the Jan Dissels River, and the refurbished works must be shown to meet them before the new module is commissioned.
- A suitably qualified wastewater process engineer must oversee the commissioning of the works and audit its performance, a dedicated works manager must be appointed, and staff, maintenance and funding must be increased in line with the additional capacity.
- A full WULA must be submitted for the section 21 (c) and 21 (i) water uses, together with the section 21 (e) and 21 (f) uses, and must include a monthly water balance for the works (inflow, irrigation and discharge to the river).
- The stormwater system must attenuate post-development peak flows to pre-

development levels, treat stormwater from both the new development and the existing informal settlement before it enters the wetland, and place outlets and any new ponds outside the wetland where possible, with a settling pond or forebay before the discharge into the wetland at Pond 7, energy dissipation and diffuse discharge.

- The Wetland Rehabilitation and Management Plan (Delta Ecology, 2026) must be implemented for the central valley-bottom wetland system, to achieve its REC of D, and the reed bed of the southern seep must be retained as a polishing wetland.
- An irrigation management plan must be prepared for the golf course.
- Before construction starts, a suitably qualified aquatic specialist and the appointed engineers must prepare a comprehensive monitoring plan, covering effluent quality and volumes, water quality upstream and downstream of the works and in the Olifants River, SASS5 and fish, and the extent of the southern seep. SASS5 and fish baseline surveys must be completed before construction. Monitoring results must be reported to DWS and the municipality.
- An Environmental Control Officer must oversee construction and compliance with the EMPr.

If post-refurbishment effluent results, the water balance or a hydrological assessment required by DWS show conditions materially different from those assumed in this addendum, the assessment should be reviewed.

Animal Species

CONCLUSION AND RECOMMENDATIONS

The sampling and analysis of the site during the optimum season and year, provides suitable data and results to present an informed decision on the local animal species. The lists of species for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach. During the site visit, the different biodiversity features, habitat, vegetation, and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and species observed were recorded. Searches for listed species of conservation concern at the site were conducted. Extensive habitat is however available for them to utilize outside the proposed vegetation clear area. There are wetlands east of the site associated to the Jan Dissels River and significant undisturbed indigenous vegetation in good quality to the south of the site and town and east towards the Jan Dissels river and beyond that the Cederberge. The presence of sensitive habitats such as wetlands or pans and unique edaphic environments, such as rocky outcrops or quartz patches, such as SCC habitats are present and therefore was recorded and mapped.
The study recorded medium and low sensitivity areas within the study area. The development of the site would have a **Medium Negative** impact on animal species. The proposed clearing will have relatively little animal species impacts provided that appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to.

No additional survey or further assessment is in the authors view recommended. Provided that activities are restricted to the property and the mitigation measures to reduce the impacts of the activities are implemented, then the activities are not likely to result in long-term degradation of the receiving environment or significant net loss of SCC animal species.

CONCLUSION

The broader Cederberg area is renowned for its rock art and significant associated archaeology. Clanwilliam and its access via the Botterkloof Pass road act as a gateway from the N7 into the rest of the Cederberg area. Clanwilliam retains a number of historic farmsteads in the area, as well as excellent examples of vernacular architecture and Provincial Heritage Sites all oriented along the structuring elements of Hoof Street, Park Street and Ou Kaapse Road. As noted above, Clanwilliam suffered when the community of Sederville was moved and their houses demolished and as a result, very little historic fabric remains within the Sederville area.

The proposed development site is predominantly underlain by the Nardouw Subgroup, specifically the Rietvlei Formation. Both the Nardouw Subgroup and the Rietvlei Formation are characterised by low palaeontological sensitivity, as they generally do not contain fossils of significant scientific or heritage value. This conclusion aligns with previous studies, which have consistently indicated that these formations are not typically rich in palaeontological resources. The potential impact of the proposed development on palaeontological resources is assessed as minimal, with a low likelihood of encountering any significant fossil material during construction. Additionally, the Goudini, Skurweberg, and Rietvlei Formations, which are also present in the broader area, share similarly low palaeontological sensitivity. As a result, no specific mitigation measures are required for the proposed residential development. While no specific mitigation strategies are required, it is recommended that the Chance Fossil Finds Procedure be implemented during the construction phase. This protocol will ensure that any unexpected fossil discoveries are promptly reported and appropriately managed, safeguarding potential heritage resources. As noted above, the archaeology field assessment did not identify any visible evidence of the supply depot and field hospital located on the Clanwilliam commonage from the South African War mentioned above, although buried evidence of this infrastructure may be present beneath the ground surface. This development activity comprises infill development within the existing urban edge of Clanwilliam. The area proposed for development is located between two areas that have been identified as having historic value and are proposed as <Heritage Zones= (Park Street precinct - Zone E - and Sederville precinct - Zone G) in the Clanwilliam SDF (2023, Figure 7). In order to ensure that the proposed development fits into this infill space, the following recommendations are proposed:

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space
- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Larger erven are positioned in the space between Zone G and Zone E
- Architectural guidelines are developed for the area between Zone G and Zone E
- Adherence to the historic grid alignment oriented around Park Street, Hoof Street and Ou Kaapse Road
- Sufficient breathing space and appropriate hierarchies in response to the significant heritage resources identified. In order to ensure that no impact to heritage resources occurs during the construction or operational phases of the development, recommendations are made below.

8. RECOMMENDATIONS

There is no objection to the proposed development from a heritage perspective on condition that:

- Open space is retained in the area indicated between the Park Street precinct and the

Sederville precinct in order to retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space. This would require the reallocation of approximately 50 GAP housing erven.
- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Due to the position of the proposed development between two areas that have been identified as having heritage value, additional design detail be submitted to HWC for approval as a condition of a positive comment on this HIA. The architecture of the proposed development should adhere to the Guidelines included as Appendix 3.
- The attached Chance Fossil Finds Procedure is implemented for the duration of construction activities
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.

Traffic Impact Assessment

CONCLUSIONS

The following can be concluded/summarised from the report:

1. This TIS accompanies the Application for Rezoning and Subdivision of Erf RE279, Clanwilliam.
2. The proposed development areas constitute Clanwilliam's Integrated Residential Development Programme (IRDP) and Upgrading of Informal Settlements Programme (UISP).
3. The total proposed subdivision includes 160x Residential Zone 1 erven, 1 155x Residential Zone 2 erven, 5x Community Zone 1 erven (1x Community Centre – 800 seats, 3x Crèche – 140 students, and 1x School – 500 students), 7x Community Zone 2 erven (Churches – 830 seats), 1x Community Zone 3 erf (Clinic – 443.4 m^2 GLA), 4x Local Business Zone 2 erven (± 3 026 m^2 GLA) and 1x Authority & Utility Zone erf (Police Station – ± 772.2 m^2 GLA).
4. The subject development areas are currently accessible via the residential streets leading to/from Ou Kaapse Way. Several additional and/or upgraded access points from/to the existing public road network are proposed for the future.
5. Traffic counts were conducted at 9 intersections in the vicinity of the proposed development areas on Thursday, 14 March 2024 during the AM (06:00 to 09:00) and PM (15:30 to 18:30) peak periods.
6. The proposed development has the potential to generate 523 AM peak hour trips (193 in, 330 out) and 471 PM peak hour trips (289 in, 182 out). These trips were distributed to/from the main streets intersecting Ou Kaapse Way.
7. Traffic analyses were performed for the most traversed sections of Graafwater Way, Main Road and Ou Kaapse Way as well as the three intersections with the highest total expected 2029 peak hour traffic volumes (Graafwater Way/Main Road, Ou Kaapse Way/Voortrekker Street/Denne Street, and Ou Kaapse Way/De Villiers Street/Bloekom Street). No upgrades are considered necessary to accommodate the total expected 2029 peak hour traffic. Nonetheless, mention is made of the potential benefits of the planned bypass road from the entrance of the town (Graafwater Way) to the industrial area (i.e. bypassing Main Road and most of the northern section of Ou Kaapse Way), which was identified as a need in the Cederberg Municipality Local Integrated Transport Plan 2020 – 2025.
8. For the new proposed local streets in the development areas, a road reserve of 10 m (typical for Class 5B local residential streets) is proposed for the residential areas, while 16 m (typical for Class 5B local commercial streets with on-street parking) is proposed for the main roads in Development Area 1 and Development Area 3.

9. The development areas' new/upgraded intersections are to be sign-controlled (i.e. stop or yield).
10. Further elements of the new streets, such as cross sections, right of way, kerb radii and sight distances are expected to be specified in the final road designs and will require separate assessment and approval based on the applicable standards.
11. Based on the information received, refuse removal will be carried out by the municipality via kerbside collection, as is current practice in the surrounding area.
12. The future parking layouts are expected to be addressed during each erf's building plan
13. application process and should comply with the requirements set out in the latest.
14. Due to its unpractical location, Clanwilliam's existing formal minibus taxi rank (situated on the corner of Mark Street and Visser Street) is not in use at present. Instead, minibus taxis operate from the front of Spar on Main Road. The relocation of Clanwilliam's rank has been identified as a prioritised project in the municipality's transport plan, and a new site has been proposed along the eastern side of Ou Kaapse Way opposite Rooitee Street. Appropriate taxi/bus stops and turning facilities need to be provided where applicable.
15. Sidewalks of at least 1.5 m should be provided inside the road reserves of the new main streets to tie in with the existing and planned pedestrian facilities and/or routes.
16. Further formal public- or non-motorised transport facilities are not deemed necessary for the proposed development areas.

RECOMMENDATIONS

From the discussions provided in this report, it is recommended that the proposed development (Clanwilliam IRDP and UISP), indicated on the attached Subdivision Plan, be supported from a traffic impact perspective.

We trust that the Traffic Impact Assessment will be to your satisfaction and will gladly provide any additional information required on request.

Impact Summary Construction phase:

Soil erosion and dust - (Medium impact before mitigation and low impact with mitigation measures);

Impact of construction activities on surface and underground water pollution - (High impact before mitigation and low impact with mitigation measures);

Impact of construction activities on surface and underground water pollution - (Medium impact before mitigation and low impact with mitigation measures);

Construction activities can affect the underlying geological layers on site to some extent pollution - (Low impact before mitigation and low impact with mitigation measures);

Increased jobs - (No impact before mitigation and positive impact with mitigation measures);

Increased traffic due to the construction activities requiring various vehicles to come onto and leave the site - (Low impact before mitigation and low impact with mitigation measures);

Waste Impacts - (Low impact before mitigation and low impact with mitigation measures);

Noise due to construction machinery - (Low impact before mitigation and low impact with mitigation measures);

Animal Species Impacts - (High impact before mitigation and low impact with mitigation measures);

Terrestrial Biodiversity Impacts - (Medium impact before mitigation and low impact with mitigation measures);

Aquatic Biodiversity Impacts - (High impact before mitigation and low impact with mitigation measures);

Operational phase:
Soil erosion and dust - (Low impact before mitigation and low impact with mitigation measures);
Increased jobs - (No impact before mitigation and positive impact with mitigation measures);
Aquatic Biodiversity Impacts - (Medium impact before mitigation and low impact with mitigation measures);

Decommissioning phase:
Similar to impacts associated with construction phase.

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GLOSSARY OF TERMS

"Activity" means an activity identified in any notice published by the Minister or MEC in terms of section 24D (1) (a) of the Act as a listed activity.
"Alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to property, activity, design, operation or technology.
"Applicant" means a person who has submitted or intends to submit an application.
"Application" means an application for an Environmental Authorization in terms of

the EIA regulations 2014, as amended.
"Associated Infrastructure," means any building or infrastructure that is necessary for the functioning of a facility or activity or that is used for an ancillary service or use from the facility.
“Biodiversity” The variety of life occurring in an area, including the number of different species, the genetic wealth within each species, and the natural habitat where they are found.
“Cultural significance” This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.
“Cumulative impact” in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
“Environmental Impact Assessment” in relation to an application to which scoping must be applied, means the process of collecting, organizing, analysing, interpreting and communicating information that is relevant to the consideration of that application.
“Environment” The environment has been defined as “The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group”. These circumstances include biophysical, social, economic, historical, cultural and political aspects.
“Environmental Assessment Practitioner” Person or company, independent of the applicant (developer), that manages the environmental assessment process of a proposed project on behalf of the applicant.
“Environmental Impact Report” In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.
"Environmental Management Programme" means a programme presenting management and mitigation measures in relation to identified or specified activities envisaged in Chapter 5 of the National Environmental Management Act and described in regulation 34.
“Heritage resources” This means any place or object of cultural significance. It also includes archaeological resources.
"Interested and Affected Party" means an interested and affected party contemplated in section 24(4) (d) of the Act, and which in terms of that section includes - (a) Any person, group of persons or organization interested in or affected by an activity; and (b) Any organ of state that may have jurisdiction over any aspect of the activity.
"Public Participation Process" means a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters; *"Registered Interested and Affected Party", in relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 57.*
“Species of Conservation Concern” All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

"Significant impact" means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

ABBREVIATIONS

CBA: Critical Biodiversity Area
DWS: Department of Water and Sanitation
DFFE: Department of Forestry, Fisheries and Environment
DEA&DP Department of Environmental Affairs and Development Planning
EAP: Environmental Assessment Practitioner
EMP: Environmental Management Programme
EIA: Environmental Impact Assessment
EIR: Environmental Impact Report
FSR: Final Scoping Report
HIA: Heritage Impact Assessment
I&APs: Interested and Affected Parties
IDP: Integrated Development Plan
LUPO Land Use Planning Ordinance (Ordinance 15 of 1985)
MAR: Mean Annual Rainfall
NEMA: National Environmental Management Act No. 107 of 1998
NWA: National Water Act No. 36 of 1998
PPP: Public Participation Process
PHRA: Provincial Heritage Resources Agency
SACNASP: South African Council for Natural Scientific Professions
SANBI: South African National Biodiversity Institute
SDF: Spatial Development Framework
ToR: Terms of Reference

SECTION 1: INTRODUCTION

This report has been prepared in compliance with the requirements of the following legislation:

- The National Environmental Management Act, 1998 (Act No. 107 of 1998) ["NEMA"];
- The Environmental Impact Assessment ("EIA") Regulations contained in Government Notice (GN) No. R983, 984 and 985 of 2014 as promulgated in terms of the NEMA ["EIA Regulations"] as amended.

The purpose of these Regulations is to regulate procedures and set criteria as contemplated in Chapter 5 of the Act to enable the submission, processing, consideration and decision-making regarding applications for environmental authorization of activities and matters pertaining thereto.

1.1 SCOPE AND CONTENTS OF THE ENVIRONMENTAL IMPACT REPORT

Table 1: EIA Scope of Assessment and Content (as required by Appendix 3 of the EIA Regulations, 2014 as amended)

Requirement	Section in Report
(a) details of –	1.2

Requirement	Section in Report
(i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Appendix H: EAP CV
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	1.3
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is – (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A: Locality Maps Appendix B: Site Plans
(d) a description of the scope of the proposed activity, including – (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development;	1.3
(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	1.4
(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;	2
(g) a motivation for the preferred development footprint within the approved site;	3
(h) a full description of the process followed to reach the proposed development footprint within the approved site, including: (i) details of the development footprint alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	3 4 & Appendix D: Public Participation Process 5 6

Requirement	Section in Report
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and (x) a concluding statement indicating the preferred alternative development location within the approved site;	
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including - (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	6
(j) an assessment of each identified potentially significant impact and risk, including – (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated;	6
(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	7
(l) an environmental impact statement which contains – (i) a summary of the key findings of the environmental impact assessment: (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	3 8 Appendix A: Locality Maps Appendix B: Site Plans
(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	7
(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures	3 8

Requirement	Section in Report
identified through the assessment;	
(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	9
(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	9
(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	9
(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	9
(s) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	11
(t) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	9
(u) an indication of any deviation from the approved scoping report, including the plan of study, including – (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	9
(v) any specific information that may be required by the competent authority; and	4
(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.	4

1.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER WHO COMPILED THIS REPORT

The role of the Environmental Assessment Practitioner ("EAP") is to manage the application for an Environmental Authorization on behalf of the applicant. The EAP must adhere to all relevant legislation and guidelines, ensuring that the reports contain all the necessary and relevant information required by the competent authority to decide. It is the responsibility of the EAP to perform all work relating to the application in an objective, appropriate and responsible manner. The EAP must comply with Regulation 13 of the EIA Regulations R982 of 2014 as amended, detailing the requirements for an EAP.

Mr Hanekom is a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions ("SACNASP") and a Reg. EAP (EAPASA): 2020/1146 who holds a Masters Technologiae, Nature Conservation ("Vegetation Ecology and Biodiversity Assessment") degree from the Cape Peninsula University of Technology.

He further qualified in Environmental Management Systems ISO 14001:2004, at the Centre for Environmental Management, North-West University, as well as Environmental Management Systems ISO 14001:2004 Audit: Internal Auditors Course to ISO 19011:2003 level, from the Centre for Environmental Management, North-West University qualifying him to audit to ISO/SANS environmental compliance and EMS standards.

Mr Hanekom has been responsible for many environmental impact assessments and several EIA, waste license and atmospheric emission license applications as well as being involved in the implementation of several environmental management systems.

1.3 PROPOSED ACTIVITY DESCRIPTION AND APPLICABLE ACTIVITIES AS APPLIED FOR

PROPOSED ACTIVITY DESCRIPTION

Cederberg Municipality for the Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:

Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 126 Single Residential Zone 1 erven - Average erf size: ±208m²
- 692 Single Residential Zone 2 erven - Average erf size: ±150m²
- 13 Open Space Zone 1 erven
- 5 Community Zone II (church) erven
- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT

- 459 Single Residential Zone II erven - Average erf size: ±120m²
- 4 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

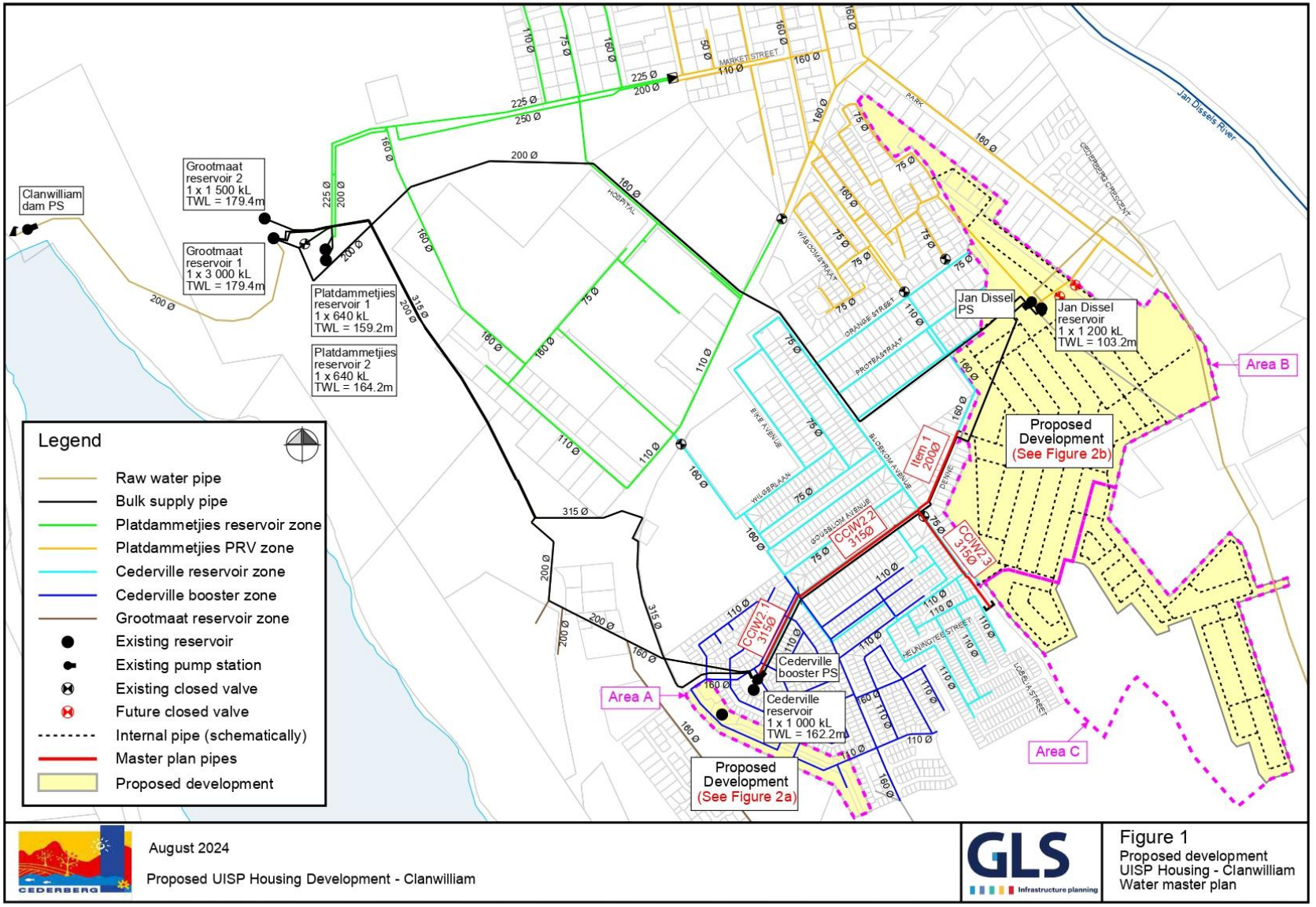
Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. The upgrade comprises refurbishment of the existing equipment, a lined night storage pond, a new 1.5 Ml/day activated sludge reactor and clarifier, and a new chlorine contact tank, giving a new rated treatment capacity of 3 600 m³/day, with the works intended to treat at least 3 600 m³/day on a constant basis during peak conditions. The night storage pond (about 1 500 m³) holds peak flows for treatment during off-peak periods; BVi (2024) refers to it as a 500 m³/day short-term increase in capacity, but it does not add treatment capacity. It is designed to meet the Special Limit Values, including COD below 30 mg/l, ammonia below 2

mg/l and phosphate below 1 mg/l (BVi, 2024).

With a total Development footprint of ±49.6ha

Water Services
The existing water reticulation system of the Cederville reservoir water distribution zone has insufficient capacity to accommodate the proposed development.

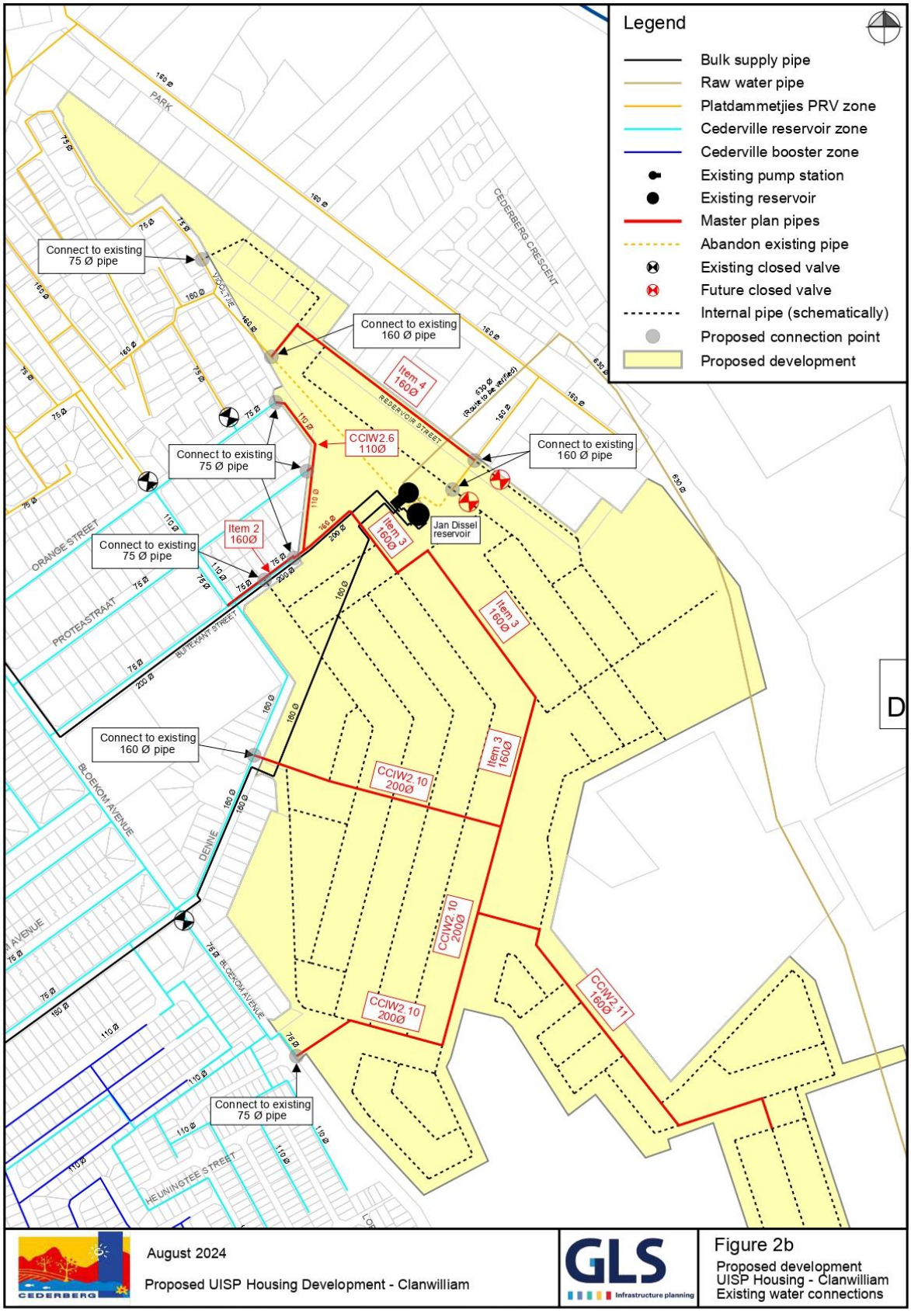
Network upgrade
- Item 1 – 190m x 200mm diameter; replace existing 160mm pipe
- Item 2 – 90m x 160m diameter; replace existing 75mm pipe
- Item 3 – 285m x 160mm diameter internal water pipes
- Item 4 – 550mm x 160mm diameter internal water pipes
- CCIW2.1 – 220m x 315mm new supply pipe
- CCIW2.2 – 320m x 315mm; replace existing 75mm pipe
- CCIW2.3 – 260m x 315mm; replace existing 75mm pipe
- CCIW2.6 – 190m x 110mm new supply pipe



August 2024

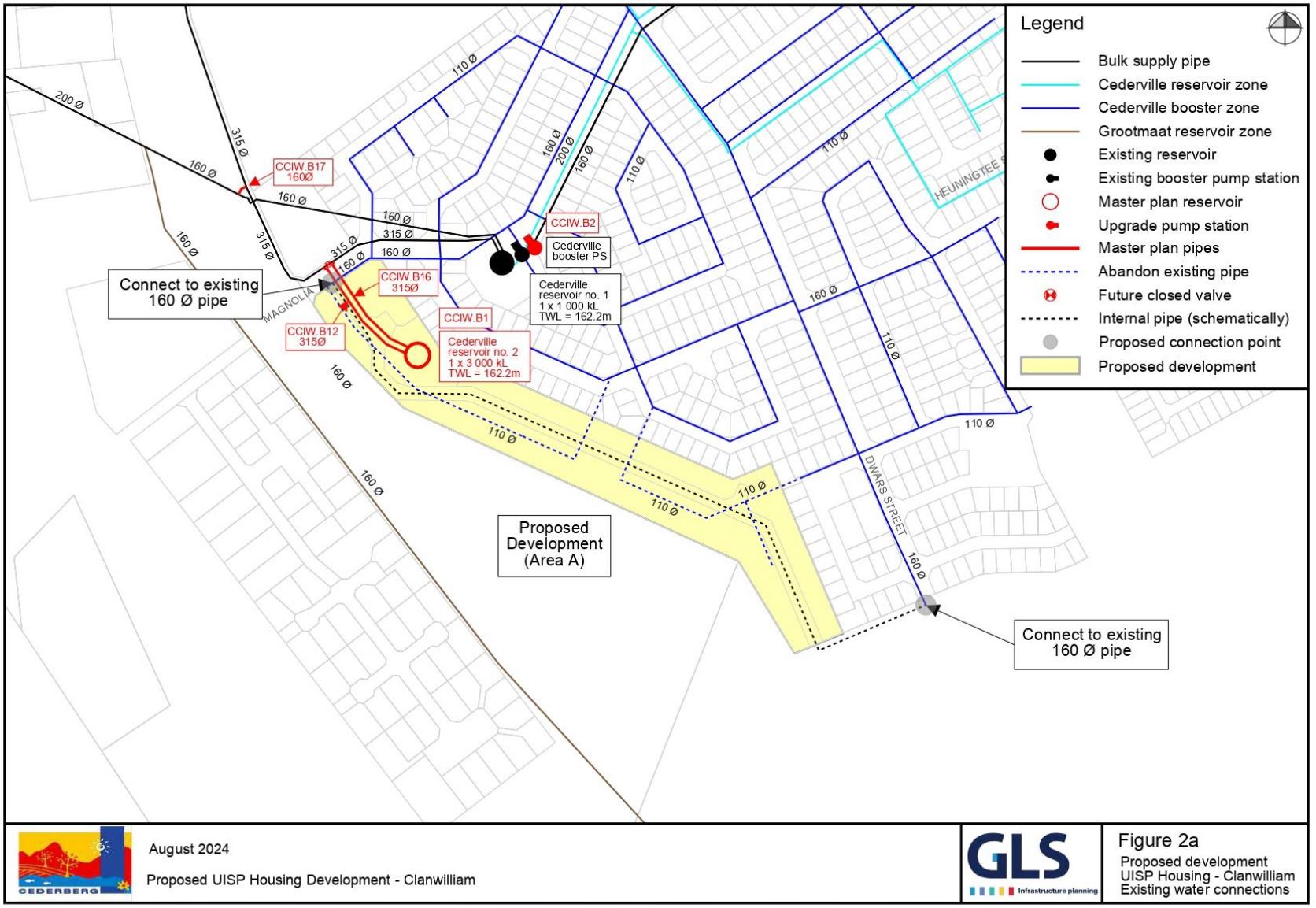
Proposed UISP Housing Development - Clanwilliam

Figure 1
Proposed development
UISP Housing - Clanwilliam
Water master plan


Legend
Bulk supply pipe
Raw water pipe
Platdammetjies PRV zone
Cederville reservoir zone
Cederville booster zone
Existing pump station
Existing reservoir
Master plan pipes
Abandon existing pipe
Existing closed valve
Future closed valve
Internal pipe (schematically)
Proposed connection point
Proposed development
Connect to existing 75 Ø pipe
Connect to existing 160 Ø pipe
Item 4 160Ø
CCIW2.6 110Ø
Item 2 160Ø
Item 3 160Ø
Jan Dissel reservoir
CCIW2.10 200Ø
CCIW2.11 160Ø
PARK
CEDERBERG CRESCENT
RESERVOIR STREET
ORANGE STREET
PROTEASTRAAT
BUITEKANT STREET
BLOEKOM AVENUE
DENNE
HEUNINGTEE STREET
August 2024
Proposed UISP Housing Development - Clanwilliam
GLS Infrastructure planning
Figure 2b
Proposed development
UISP Housing - Clanwilliam
Existing water connections

Reservoir

- CCIW.B1: 3 000 kL additional storage capacity for Cederville reservoir site
- CCIW.B12: 90 m x 315 mm Ø New feeder pipe to Cederville no. 2 reservoir
- CCIW.B16: 90 m x 315 mm Ø link pipe between Cederville no. 1 & 2 reservoirs
- CCIW.B17: 5 m x 160 mm Ø inter-connection pipe between 2x bulk pipes


Legend
Bulk supply pipe
Cederville reservoir zone
Cederville booster zone
Grootmaat reservoir zone
Existing reservoir
Existing booster pump station
Master plan reservoir
Upgrade pump station
Master plan pipes
Abandon existing pipe
Future closed valve
Internal pipe (schematically)
Proposed connection point
Proposed development
Connect to existing 160 Ø pipe
CCIW.B17 160Ø
CCIW.B16 315Ø
CCIW.B12 315Ø
CCIW.B1
CCIW.B2
Cederville booster PS
Cederville reservoir no. 1 1 x 1 000 kL TWL = 162.2m
Cederville reservoir no. 2 1 x 3 000 kL TWL = 162.2m
MAGNOLIA
HEUNINGTEE
DWARS STREET
Proposed Development (Area A)
Connect to existing 160 Ø pipe
August 2024
Proposed UISP Housing Development - Clanwilliam
GLS
Infrastructure planning
Figure 2a
Proposed development
UISP Housing - Clanwilliam
Existing water connections

Sewer Services

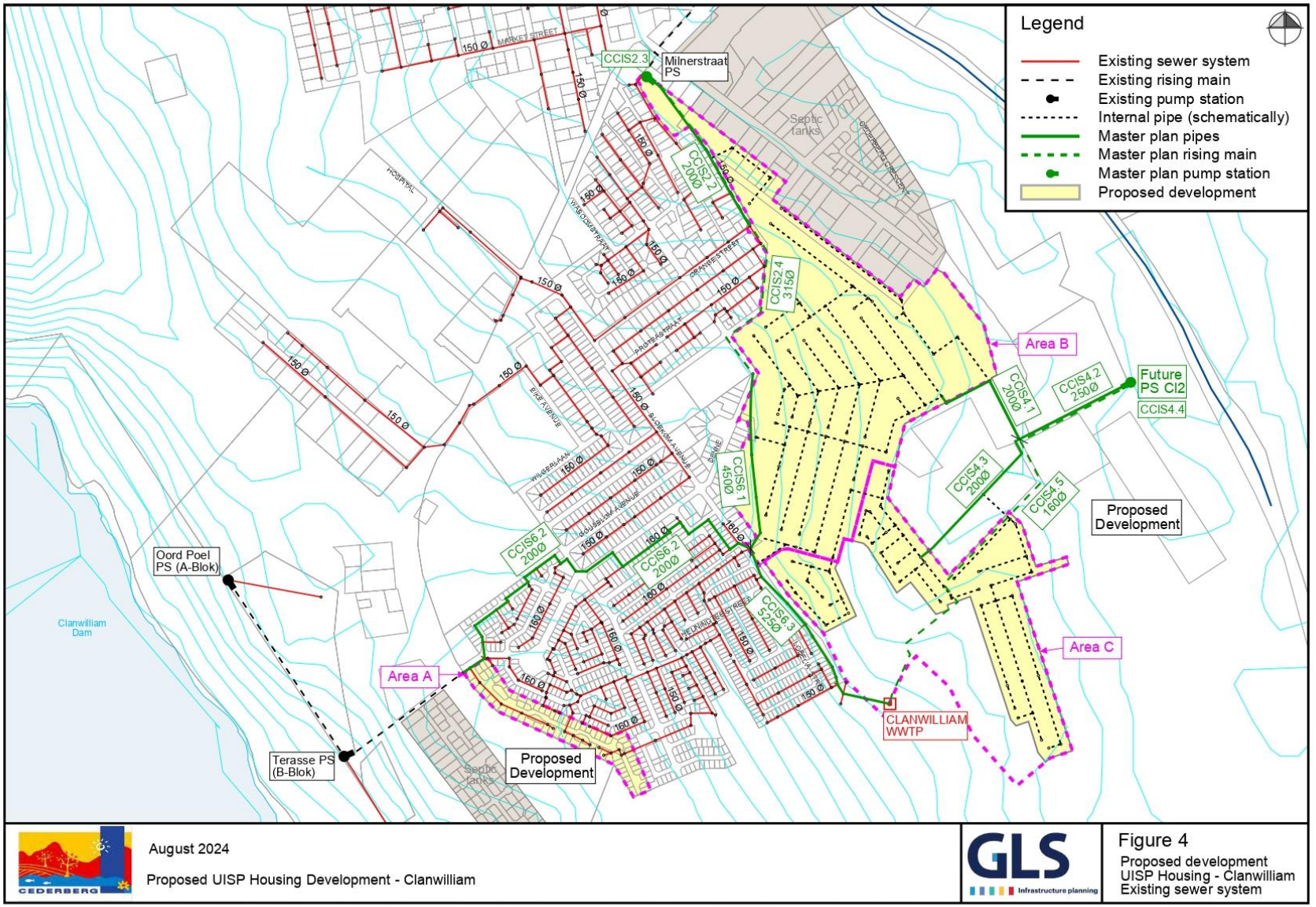
- CCIS6.1 – 380 m x 450 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS6.2 – 950 m x 200 mm Ø Upgrade existing 160 mm Ø outfall sewer
- CCIS6.3 – 475 m x 525 mm Ø Upgrade existing 150 mm Ø bulk sewer
- CCIS2.2 – 370 m x 200 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS2.3 – Upgrade capacity of Milner Street PS to 55 L/s
- CCIS2.4 – 780 m x 315 mm Ø Upgrade existing 200 mm Ø rising main
- CCIS4.1 – 260 m x 200 mm Ø New outfall sewer
- CCIS4.2 – 270 m x 250 mm Ø New outfall sewer
- CCIS4.3 – 350 m x 200 mm Ø New outfall sewer
- CCIS4.4 – New 20 L/s Future PS Cl2
- CCIS4.5 – 1 005 m x 160 mm Ø New rising main

For the development of Area A the following upgrades are required:

- Master plan items CCIS6.2 & CCIS6.3 to reinforce the capacity of the existing gravity system
- between the proposed development and the Clanwilliam WWTP.
- Link services items CCIS4.1 & CCIS4.2 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.
- A small portion of the development drains towards the existing Milner Street PS, which discharges into the Clanwilliam Gravity drainage areas. The bulk sewer downstream of the Milner Street PS is at capacity and should be upgraded (master plan items CCIS6.1 & CCIS6.3).
- The existing Milner Street PS drainage area has spare capacity to accommodate the erven within development area A which drains towards the Milner Street PS. In the sewer master plan for Clanwilliam upgrading of the Milner Street PS and accommodating rising main is however proposed (refer to master plan items CCIS2.3 & CCIS2.4), as well as upgrading of the main outfall sewer gravitating toward the Milner Street PS (refer to master plan item CCIS2.2). It can be considered to upgrade the PS, rising main and outfall sewer (master plan items CCIS2.2, CCIS2.3 & CCIS2.4) as part of the construction of the development as these items runs through the development area.

For the development of Area B the following upgrades are required:

- Link services items CCIS4.2 & CCIS4.3 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.


Legend
Existing sewer system
Existing rising main
Existing pump station
Internal pipe (schematically)
Master plan pipes
Master plan rising main
Master plan pump station
Proposed development
CCIS2.3
Milnerstraat PS
CCIS2.2 200Ø
CCIS2.4 315Ø
Area B
CCIS4.1 200Ø
CCIS4.2 250Ø
Future PS CI2
CCIS4.4
CCIS4.3 200Ø
CCIS4.5 160Ø
Proposed Development
CCIS6.1 450Ø
CCIS6.2 200Ø
CCIS6.3 525Ø
Area C
Oord Poel PS (A-Blok)
Clanwilliam Dam
Area A
Terasse PS (B-Blok)
Proposed Development
CLANWILLIAM WWTP
Septic tanks
August 2024
Proposed UISP Housing Development - Clanwilliam
GLS
Infrastructure planning
Figure 4
Proposed development
UISP Housing - Clanwilliam
Existing sewer system

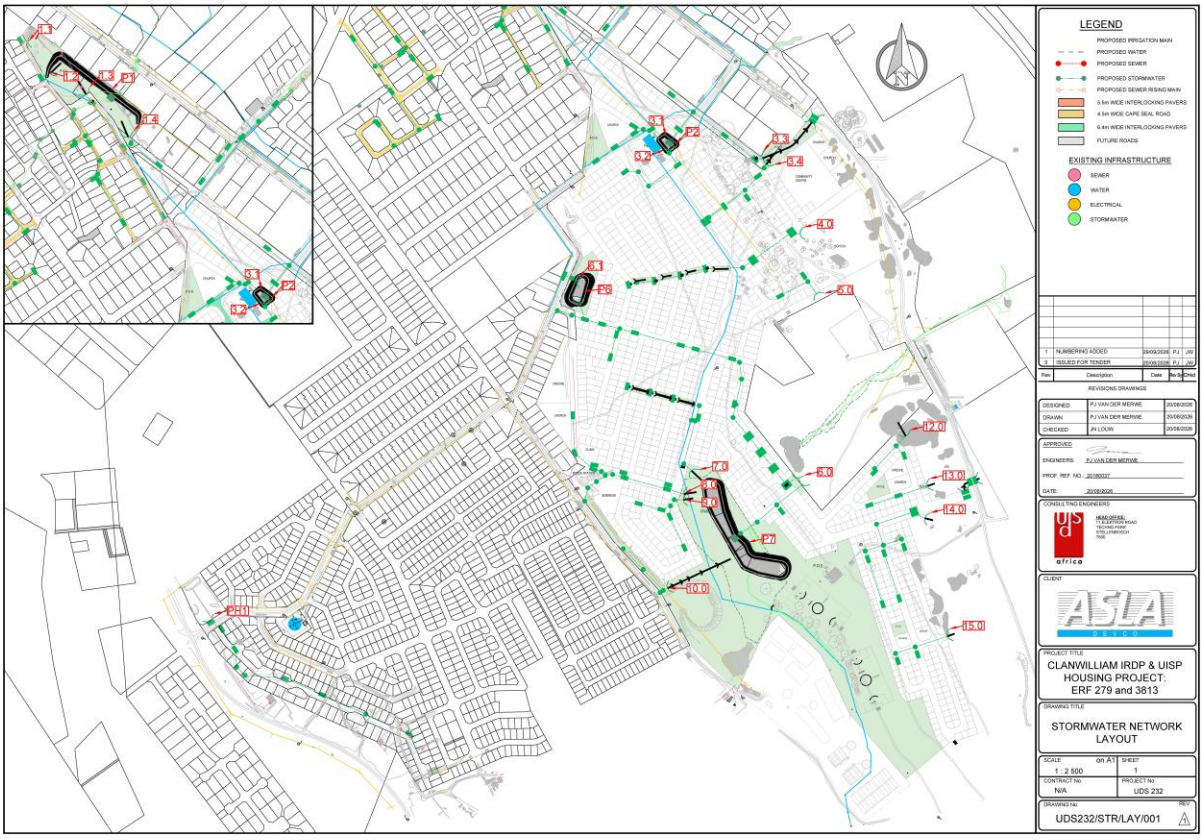
Stormwater

An underground piped stormwater system will be provided to accommodate for the minor storm events (up to RI 1: 5 years). The major storm events will be accommodated within the street reserves. Stormwater run-off will be channelled to the existing Jan Dissels River flowing to the east of the proposed development using existing non-perennial river after it was detained and controlled released on an open space erf specifically created for stormwater control inside the development. Six other outlets on the eastern side will be constructed where stormwater pipe outlets will release stormwater next to roads and infrastructure. The degraded wetland on the western side and north of the WWTW with its greater open space area will be used to collect the existing stormwater released from the development on the western edge and other generated stormwater on the development. Building rubble and litter, as well as alien invasive trees will be controlled and eradicated from this area.

The stormwater infrastructure, comprising 21 headwalls, four attenuation ponds and a piped connection within the central valley-bottom wetland system, and the refurbishment and expansion of the WWTW, with a new 1.5 Ml/day module and the upgraded works intended to treat at least 3.6 Ml/day at peak, were assessed. With mitigation, the construction impacts and the operational impacts of the stormwater system are of Low significance. Combined with the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026), the stormwater design offers an opportunity to improve the central wetland, which currently receives untreated stormwater from the informal settlement and township.

Stormwater will be collected by kerb inlets and underground pipes designed for the 1:5-year event, with larger events conveyed in the road reserves, and discharged through headwalls into the retained wetland system and towards the Jan Dissels River (UDS Africa, 2026b; Enviro-EAP, 2026) (**Figure 2-2**). The conceptual layout showed 10 headwalls, most discharging towards the Jan Dissels River, two directly into the wetland and two upstream of it (UDS Africa, 2026a). The tender-stage layout has 21 numbered headwalls, with design discharges of 17 to 843 l/s through 375 to 750 mm pipes, and four attenuation ponds (Ponds 1, 2, 6 and 7) (UDS Africa, 2026b). Overflow from Wetland 1 to Wetland 2 (both form part of the unchannelled valley-bottom wetland system) will be piped beneath the golf course.

The ponds were sized with the Abt and Grigg method to attenuate the 1:100-year peak inflow to the post- development 1:2-year flood peak (UDS Africa, 2026b). Pond 7, the largest, provides 4 853 m³ of storage against 2 913 m³ required and reduces a 1:100-year inflow of 5 863 l/s to 209 l/s. Pond 1's designed outflow (417 l/s) is marginally above its allowable rate (410 l/s). Each pond outlet is a field inlet or headwall with an open top for emergency overflow.



Roads
Access to the proposed development will be provided from the existing Bloekom Avenue, south of the proposed development, Denne and Buitekant Street to the west and from Oranje, Protea and Viooltjie Streets to the north. The internal roads (main access road 16m wide and other internal roads 10m wide) will consist of surfaced streets.

An application for Environmental Authorisation was submitted to the competent authorities in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), the Environmental Impact Assessment Regulations 2014 (as amended).

Enviro-EAP is appointed as independent Environmental Assessment Practitioners to undertake the Environmental Impact Assessment Process for the proposed development.

This Environmental Authorization is undertaken in terms of the National Environmental Management Act 107 of 1998 and the EIA regulations 2014 as amended set out in Government Notice (GN R 983, 984 and 985). Listed activities in terms of these regulations have been identified. The nature of the activities to be undertaken requires that a Scoping and Environmental Impact Assessment (EIA) process be undertaken.

Table 2: Listed Activities associated with the proposed development:

Activity No(s):	Provide the relevant **Basic Assessment Activities** as set out in **Listing Notice 1**	Describe the portion of the <u>proposed development</u> to which the applicable listed activity relates.
Activity 9: The development of infrastructure		The proposed housing development stormwater infrastructure will be longer than

exceeding 1 000 metres in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; ~~excluding where—~~ ~~(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or~~ ~~(b) where such development will occur within an urban area.~~	100m and have a peak throughput of 120 litres per second or more
Activity 12: The development of— ~~(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or~~ (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— ~~(a) within a watercourse;~~ ~~(b) in front of a development setback; or~~ (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse— ~~excluding—~~ ~~(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;~~ ~~(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;~~ ~~(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;~~ ~~(dd) where such development occurs within an urban area;~~ ~~(ee) where such development occurs within existing roads, road reserves or railway line reserves; or~~ ~~(ff)the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of the development and where indigenous vegetation will not be cleared.~~	A portion of the housing development is within 32m from a non-perennial river. Take note that the non-perennial river historically flowed through a section of the proposed housing development, but this section of the non-perennial river was filled in long ago with the development of the golf course.

Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; ~~but excluding where such infilling, depositing, dredging, excavation, removal or moving—~~ ~~(a) will occur behind a development setback;~~ ~~(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;~~ ~~(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;~~ ~~(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or~~ ~~(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.~~	A portion of the housing development is within 32m from a non-perennial river. Take note that the non-perennial river historically flowed through a section of the proposed housing development, but this section of the non-perennial river was filled in long ago with the development of the golf course. The construction of the housing and infrastructure will impact on this historical non-perennial river route.
Activity 24: The development of a road— ~~(i) for which an environmental authorisation was obtained for the route~~ ~~determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or~~ (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; ~~but excluding a road—~~ ~~(a) which is identified and included in activity 27 in Listing Notice 2 of 2014;~~ ~~(b) where the entire road falls within an urban area; or~~ ~~(c) which is 1 kilometre or shorter.~~	The housing development roads will be longer than wider than 8m and longer than 1km.
Activity 28: Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development— ~~(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or~~ (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	The housing development and WWTW will be approximately 12ha in extent. The area is described as an erf, but located outside the urban area and was used for agricultural purposes on or after 1998.

~~excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.~~		
Activity 57: The expansion and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage where the capacity will be increased by 15 000 cubic metres or more per day and the development footprint will increase by 1 000 square meters or more.		The WWTW expansion will have a treatment throughput of less than 2 000 cubic metres per day. However, the expanded infrastructure is bigger than 1000 square meters.
Activity No(s):	Provide the relevant **Basic Assessment Activities** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
Activity 4: The development of a road wider than 4 metres with a reserve less than 13,5 metres. (i) Western Cape (i) Areas zoned for use as public open space or equivalent zoning; (ii) Areas outside urban areas; (aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or (iii) Inside urban areas: (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.		The housing development roads will be longer than wider than 8m and longer than 1km.
Activity 15: “The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010. **i. Western Cape** i. Outside urban areas, or ii. Inside urban areas: (aa) Areas zoned for conservation use or equivalent zoning, on or after 02 August 2010; (bb) A protected area identified in terms of NEMPAA, excluding conservancies; or (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act as adopted by the competent authority.”		A portion of the housing project bigger than 1000 square meters impact on the golf course who has an open space zonation.

Activity No(s):	Provide the relevant **Scoping and EIR Activities** as set out in **Listing Notice 2**	Describe the portion of the proposed development to which the applicable listed activity relates.
Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.		The proposed development will result in the clearing of more than 20ha of indigenous vegetation.

Note:

- Only those activities listed which will be applied for shall be considered for authorisation. The onus is on the Applicant to ensure that all applicable listed activities are included in the application. Environmental Authorisation must be obtained prior to commencement with each applicable listed activity. If a specific listed activity is not included in an Environmental Authorisation, a new application for Environmental Authorisation will have to be submitted.

- The Minister responsible for mineral resources is the Competent Authority to deal with all applications where the listed or specified activity is directly related to-

  (a) prospecting or exploration of a mineral or petroleum resource; or
  (b) extraction and primary processing of a mineral or petroleum resource.

1.4 LEGISLATIVE ASPECTS

Allocation of applicable environmental legislation are listed in Table 3 and the most relevant of these is discussed below

Table 3: Applicable Legislation and/or Policies etc.

List any other legislation that is applicable to the proposed activity or development.		
LEGISLATION	**ADMINISTERING AUTHORITY and how it is relevant to this application**	**TYPE Permit/license/authorisation/comment / relevant consideration**
Constitution of the Republic of South Africa, 1996	General application to individual rights of all on and adjacent to the sites.	Public Participation Process to be conducted
National Environmental Management Act, 1998 (Act No. 107 of 1998)	Western Cape Department of Environmental Affairs and Development	Environmental Authorisation Application

[NEMA] and relevant regulations	Planning	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [NEMWA] and relevant regulations	Department of Environmental Affairs	Waste management requirements.
National Environmental Management: Biodiversity Act 10 of 2004 [NEMBA]	Western Cape Department of Environmental Affairs and Development Planning	N/A
National Water Act, 1998 (Act No. 36 of 1998) [NWA] and relevant regulations	Department of Water Affairs	Water use license required
The erven, services and roads will be constructed within the 100m and 500m National Water Act regulated zone.		
Conservation of Agricultural Resources Act, 43 of 1983 [CARA]	National Department of Agriculture, forestry and Fisheries Western Cape Department of Agriculture	N/A
National Health Act, 61of 2003 [NHA]		N/A
National Building Regulations and Building Standards Act 103 of 1977 [NBRBSA] and relevant regulations		N/A
National Heritage Resources Act 25 of 1999 [NHRA]	Heritage Western Cape South African Heritage Resource Agency	NID followed by Heritage Impact Assessment

National Veld and Forest Fire Act 101 of 1998 [NVFFA]		N/A
Western Cape Noise Control Regulations [P.N. 200/2003]		NA

Protocols

The protocol (Published in Government Notice No. 648 GOVERNMENT GAZETTE 4542110 MAY 2019. Published in Government Notice No. 1150 GOVERNMENT GAZETTE 43855 30 October 2020. Published in Government Notice No. Government Notice No. 320, Government Gazette 43110: 20 March 2020. These gazettes are also available free online at www.gpwonline.co.za) provides the criteria for the reporting of requirements for the assessment and reporting of impacts as identified in the DEA Screening tool report.
Published in Government Notice No. 320 GOVERNMENT GAZETTE 43110 20 MARCH 2020 GAZETTED FOR IMPLEMENTATION: BIODIVERSITY PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL BIODIVERSITY
Published in Government Notice No. 320 GOVERNMENT GAZETTE 43110 20 MARCH 2020 GAZETTED FOR IMPLEMENTATION: BIODIVERSITY PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON AQUATIC BIODIVERSITY
Published in Government Notice No. 1150 GOVERNMENT GAZETTE 43855 30 OCTOBER 2020 GAZETTED FOR IMPLEMENTATION: PLANT SPECIES PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON PLANT SPECIES
Published in Government Notice No. 1150 GOVERNMENT GAZETTE 43855 30 OCTOBER 2020 GAZETTED FOR IMPLEMENTATION: ANIMAL SPECIES PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON ANIMAL SPECIES

Policies

An environmental policy is derived from the guiding principle whereby an organization first defines the scope of its commitment to the environment. The policy is a public document that communicates the organization's overall approach to managing its interaction with the environment.

Various components of Environmental Management are strongly influenced by the environmental policies in terms of their scope and level of resource allocation. As a rule, objectives and targets are set to achieve compliance with the environmental policy, and overall environmental performance is evaluated against the organization's stated

intent reflecting a level of commitment.

Policy must meet the following criteria:

- It must be relevant to the nature of an organization's activities, and the specific environmental aspects associated with those activities;
- It must consider specific local environmental conditions;
- It must consider relevant environmental legislation;
- It must define and formulate the organization's fundamental approach to environmental management; and
- It must set a precedent for communication and liaison with all stakeholders.

Policies considered in the compilation of this document include:

- National Spatial Development Framework;
- Provincial Spatial Development Framework for the Western Cape;
- Framework for a conservation plan for the Cape Floristic Region.

1.4.3 Guidelines

The following guidelines are applicable to this project, and have been considered in the preparation of the Scoping Report:

- Guideline on Public Participation;
- Information of Generic Terms of Reference and Project Schedules;
- Circular EADP 0028/2014: One Environmental Management System;
- Guideline for Involving a Heritage Specialist in an EIA Process (2005);
- Guideline for the Review of Specialist Input in the EIA process (June 2005);
- Guideline for Environmental Management Plans (June 2005);
- Guideline on Alternatives (March 2013); and
- Guideline on Need and Desirability (March 2013).

1.5 APPROACH TO THE PROJECT

As outlined in the Scoping Report, there are three distinct phases in the EIA process, as required in terms of the NEMA, namely the Initial Application, the Scoping Report and the EIA phases. The Initial Application phase entailed the submission of the Application Form, whilst the Scoping Report phase entailed the compilation and submission of the Scoping Report and Plan of Study for EIA. This report covers the EIA phase.

The EIR describes and assesses the range of feasible alternatives identified during the Scoping phase. The EIR also provides an assessment of all possible direct and cumulative environmental impacts. The Draft EMP, which provides management and mitigation measures for all the identified impacts accompany the EIA. The ultimate purpose of the EIR is to provide a basis for informed decision-making, firstly by the applicant with respect to the alternatives they wish to pursue, and secondly by the environmental authority regarding the environmental acceptability of the applicant's preferred option.

The approach to the EIA phase entailed the following:

- Undertaking a further review of relevant literature;
- Appointing various specialists to undertake the specialist studies as identified during the Scoping phase.
- Additional public consultation: This forms an integral component of this investigation and enables Interested and Affected Parties (I&APs) to comment on the potential environmental impacts associated with the feasible alternatives.

This Draft EIA Report will be submitted to the registered I&APs and key department to identify additional issues, which they may feel have not been adequately addressed during the Scoping Report. Once the EIA Report has been finalised and all I&AP comments have been incorporated into the report, the final EIA Report will be submitted to DEA&DP for their review and decision making.

Plan of study as was identified during the Scoping phase for the EIA phase:

- **Alternatives will be further investigated**, in a re-iterative manner, so as to avoid or minimize negative impacts and maximize potential benefits; The entire project team, including the specialist consultants, will be involved in the evaluation of alternatives;

- **Detailed Impact Assessment**:

Statements regarding the potential significance of residual impacts, taking into account proposed mitigation measures will be provided in the EIA;

- **An Environmental Management Programme (EMP)** covering construction, operational and decommissioning phases of the proposed development will be prepared after input from specialists, incorporating recommendations for mitigation, monitoring and evaluation are received. Specific issues to be addressed in the EMPr as per recommendations of key departments/organ of state and I&APs include:
  - Site specific stormwater management plan;
  - Detailed construction management requirements;
  - Detailed operational management requirements i.e. stormwater, erosion, alien vegetation, litter control and access to the development and open space areas;
  - Waste management (and associated pollution prevention/mitigation);
  - Heritage resources management.

- **Specialist Assessments**:

Specialist Report Identified	**Reason/s for the Assessment to be Conducted or Not to be Conducted (as provided by the EAP)**
Terrestrial Biodiversity Impact Assessment	Terrestrial Biodiversity Impact Assessment was conducted.
Aquatic Biodiversity Impact Assessment	Aquatic Biodiversity Impact assessment was conducted. Then peer reviewed and updated. Additional assessment also included.
Plant Species Assessment	No plant species of conservation concern were observed on the site during the time of the survey. A plant species compliance statement was conducted by Nicolaas Hanekom.

Animal Species Assessment	No animal species of conservation concern were observed on the site during the time of the survey. An animal species impact assessment was conducted by Nicolaas Hanekom. Then it was peer reviewed and updated.
Heritage Impact Assessment	HWC requires that a Heritage Impact Assessment (HIA) that satisfies the provisions of Section 38(3) of the NHRA be submitted. Section 38(3) of the NHRA provides. The following must be included: (a) The identification and mapping of all heritage resources in the area affected; (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7; (c) an assessment of the impact of the development on such heritage resources; (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development; (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources; (f) if heritage resources will be adversely affected by the proposed development, The consideration of alternatives; and (g) plans for mitigation of any adverse effects during and after the completion of the proposed development. This HIA must in addition have specific reference to the following: - Archaeological Impact Assessment - Palaeontological Impact Assessment The HIA must have an overall assessment of the impacts to heritage resources which are not limited to the specific studies referenced above.
Traffic Impact Assessment	Traffic Impact Assessment will be conducted in terms of methodologies and Terms of References applicable to Traffic Impact Assessment.

SECTION 2: NEED AND DESIRABILITY

2.1 RATIONALE FOR THE DEVELOPMENT

MOTIVATION FOR APPLICATION:

The direct community needs are for low-cost housing, which is a serious and urgent need. In

order to unlock funding for the construction of these houses, the Cederberg Municipality must be capable to deliver a long-term sustainable sanitation service for the new houses as well as the rest of the Clanwilliam residents. This project aims to put infrastructure in place, to allow Cederberg Municipality to provide this service, and in turn, address the needs of the community.

Clanwilliam has a population of approximately 7 674 persons and 2 363 households (Statistics SA: Census 2011). The town is primarily an agricultural service center with Rooibos tea and intensive citrus production being the predominant economic drivers for the town.

The Clanwilliam WWTP is currently equipped with two treatment modules, each comprising an oxidation ditch and a clarifier. The plant has a rated design capacity of 2400m^3/day according to the municipality. High level capacity calculations indicate that the plant is able to cope with a flow of 2400m^3/day, but at a limited organic load, with COD concentrations not exceeding 580mg/l. At a flow of 2100m^3/day, an organic concentration of 650mg/l could be managed. Currently, the plant is receiving in the order of 2200m^3/day (94% of rated maximum) with a very high organic concentration of 978mg/l COD. The plant is not able to deal with this organic load for a variety of reasons, and this is reflected in the very poor Final Effluent analysis results. In the previous 15 months, the plant effluent did not comply with the General Limit values on even a single occasion.

The Cederberg Local Municipality is desirous to develop an additional 1 158 stands in Clanwilliam, for low-cost housing. These stands will contribute an additional 579m^3/day to the current flow to Clanwilliam WWTP. Given the current condition of the Clanwilliam WWTP, and the high strength sewage being received, the additional flow will not be able to be accommodated, unless funding is made available to repair and upgrade the existing works, to enable it to perform optimally.

The Clanwilliam WWTP treatment capacity must be extended. The correct long-term solution for the Clanwilliam WWTP being to add another module capable of treating wastewater for the expected 2030 population. This indicates an expansion capable to treat an additional 1 500m^3/day. The Clanwilliam Wastewater Treatment Plant will be expanded to a new rated treatment capacity of 3 600m^3/day. This project addresses the upgrade of both the future treatment capacity and the refurbishment of the existing mechanical and electrical equipment which have deteriorated over time due to age and normal wear and tear.

APPLICATION:
The main purpose of this Environmental Authorization and Water Use License application is to develop housing and stands to meet the requirement of Clanwilliam. The WWTW also needed to be upgrade and expanded to improve current treatment as well as to provide for capacity to service the expansion and increase in services needs as result of the housing development.

1. Is the activity permitted in terms of the property's existing land use rights?	[redacted]	NO	Please explain
Open Space 1 and undetermined.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES	[redacted]	Please explain

The Western Cape Spatial Development Framework (PSDF) was approved by the executive authority in 2014 and endorsed by the Provincial Cabinet to replace the previous PSDF. The Western Cape PSDF has been framed to take forward the National Development Plan's spatial agenda, as well to give effect to the Provincial Strategic Objectives, including the One Cape 2040 initiative, the Western Cape Infrastructure Framework (WCIF) and the Western Cape Provincial Land Transport Framework (PLTF).
The PSDF's policy framework covers provincial spatial planning's three interrelated themes, namely (1) Sustainable use of the Western Cape's spatial assets, (2) Opening-up opportunities in the Provincial space-economy, and (3) Developing integrated and sustainable settlements. The Western Cape Spatial Development Framework points out that the average densities of cities and towns in the Western Cape is low by international standards, in spite of policies to support mixed-use and integration. Furthermore, the PSDF states that there is clear evidence that urban sprawl and low densities contribute to unproductive and inefficient settlements as well as increase the costs of municipal and Provincial service delivery.

The PSDF further indicates that a lack of integration, compaction and densification in urban areas in the Western Cape has serious negative consequences for municipal finances, for household livelihoods, for the environment, and the economy. The PSDF suggests that in order to move towards a more sustainable future for the Province it is important that settlement planning and infrastructure investment achieves:

- higher densities
- a shift from a suburban to urban development model
- more compact settlement footprints to miminise environmental impacts, reduce
- the costs and time impacts of travel and enhance Provincial and Municipal financial sustainability in relation to the provision and maintenance of
- infrastructure, facilities and services.
- address apartheid spatial legacies by targeting investment in areas of high
- population concentration and socioeconomic exclusion.

It is further mentioned that, prioritising a more compact urban form through investment and development decisions, settlements in the Western Cape can become more inclusionary, widening the range of opportunities for all. Reference is made to "Policy S3: Promote Compact, Mixed Use and Integrated Settlements". This is one of the policies proposed by the PSDF with particular emphasis on developing integrated and sustainable settlements. According to the PSDF this policy can be achieved by doing the following:
1. Target existing economic nodes (e.g. CBDs, township centres, modal interchanges, vacant and under-utilised strategically located public land parcels, fishing harbours, public squares and markets, etc) as levers for the regeneration and revitalisation of settlements.
2. Promote functional integration and mixed-use as a key component of achieving improved levels of settlement liveability and counter apartheid spatial patterns and decentralization through densification and infill development.
3. Locate and package integrated land development packages, infrastructure and services as critical inputs to business establishment and expansion in places that capture efficiencies associated with agglomeration.
4. Prioritise rural development investment based on the economic role and function of settlements in rural areas, acknowledging that agriculture, fishing, mining and tourism remain important economic underpinnings of rural settlements.
5. Respond to the logic of formal and informal markets in such a way as to retain the flexibility required by the poor and enable settlement and land use patterns that support informal livelihood opportunities rather than undermine them.
6. Delineate Integration Zones within settlements within which there are opportunities for spatially targeting public intervention to promote more inclusive, efficient and sustainable forms

of urban development. 7. Continue to deliver public investment to meet basic needs in all settlements, with ward level priorities informed by the Department of Social Development's human development indices. 8. Municipal SDFs to include growth management tools to achieve SPLUMA's spatial principles. These could include a densification strategy and targets appropriate to the settlement context; an urban edge to protect agricultural land of high potential and contain settlement footprints; and a set of development incentives to promote integration, higher densities and appropriate development typologies. Based on the above, the development proposal is deemed to be consistent with the Provincial Spatial Development Framework (PSDF, 2014).			
(b) Urban edge / Edge of Built environment for the area		NO	Please explain
Infill development on established erven.			
(c) Integrated Development Plan and Spatial Development Framework of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES		Please explain
The information in Appendix H (rezoning application) information was included in the final EIR. Cederberg Municipal Spatial Development Framework (2023-2027) The Cederberg Municipal Spatial Development Framework provides the planning guidelines that guide forward planning and development in Clanwilliam and the Cederberg Municipal Area as a whole. Broad overarching objectives of the MSDF, informed by the strategic objectives of the IDP include; densification within the urban edge and protecting the place identity and town character are all supported by this development proposal. The spatial objectives of the SDF translate into certain development proposals for all the Cederberg towns. Clanwilliam is identified as a sub-regional node and its functions, within the Cederberg region, includes being the main administrative town, agricultural service and commercial centre, cultural history, tourism and light industrial (Rooibos tea, leather shoes). Considering that the development area is located within the urban edge of Clanwilliam, there are proposals at settlement level. With reference to the Spatial Proposal Map for Clanwilliam, the development area is located within Zone I. This zone is "earmarked for proposed mixed use development with supporting institutional and commercial uses such as a correctional services facility (juvenile detention centre) and a cemetery site the zone is also home to the Khayelitsha informal settlement. Infill medium density residential expansion is proposed along the DR 2183/ R539, with cemetery site. Allow for expansion of the cemetery site. This Zone also includes a secondary business node along Park Street and development should be sensitive to furrows within this zone". With reference to the land use zone table, the Cederberg Spatial Development Framework provides additional support for the establishment of a wide range of land uses within this designated zone. This, in turn, highlights the support for creating sustainable, livable and compact settlements (as proposed in this application). By doing so, the development supports the creation of an integrated residential development, with supporting amenities. Refer to the below extract from the land use zone table for Clanwilliam. Considering the above, the development proposal is deemed to be consistent with the Cederberg Municipal Spatial Development Framework (2023-2027).			
(d) Approved Structure Plan of the Municipality	YES		Please explain
Rezoning from Open Space 1 and undetermined to single residential will be required.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)			Please explain
No EMF adopted for area.			
(f) Any other Plans (e.g. Guide Plan)		NO	Please explain

NA			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	■	Please explain
The information in Appendix H (rezoning application) information was included in the final EIR. Cederberg Municipal Spatial Development Framework (2023-2027) The Cederberg Municipal Spatial Development Framework provides the planning guidelines that guide forward planning and development in Clanwilliam and the Cederberg Municipal Area as a whole. Broad overarching objectives of the MSDF, informed by the strategic objectives of the IDP include; densification within the urban edge and protecting the place identity and town character are all supported by this development proposal. The spatial objectives of the SDF translate into certain development proposals for all the Cederberg towns. Clanwilliam is identified as a sub-regional node and its functions, within the Cederberg region, includes being the main administrative town, agricultural service and commercial centre, cultural history, tourism and light industrial (Rooibos tea, leather shoes). Considering that the development area is located within the urban edge of Clanwilliam, there are proposals at settlement level. With reference to the Spatial Proposal Map for Clanwilliam, the development area is located within Zone I. This zone is "earmarked for proposed mixed use development with supporting institutional and commercial uses such as a correctional services facility (juvenile detention centre) and a cemetery site the zone is also home to the Khayelitsha informal settlement. Infill medium density residential expansion is proposed along the DR 2183/ R539, with cemetery site. Allow for expansion of the cemetery site. This Zone also includes a secondary business node along Park Street and development should be sensitive to furrows within this zone". With reference to the land use zone table, the Cederberg Spatial Development Framework provides additional support for the establishment of a wide range of land uses within this designated zone. This, in turn, highlights the support for creating sustainable, livable and compact settlements (as proposed in this application). By doing so, the development supports the creation of an integrated residential development, with supporting amenities. Refer to the below extract from the land use zone table for Clanwilliam. Considering the above, the development proposal is deemed to be consistent with the Cederberg Municipal Spatial Development Framework (2023-2027).			
4. Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	YES	■	Please explain
Infill development on established erven. Rezoning from Open Space 1 and undetermined to single residential will be required.			
5. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	■	Please explain
The direct community needs are for low-cost housing, which is a serious and urgent need. In order to unlock funding for the construction of these houses, the Cederberg Municipality must be capable to deliver a long-term sustainable sanitation service for the new houses as well as			

the rest of the Clanwilliam residents. This project aims to put infrastructure in place, to allow Cederberg Municipality to provide this service, and in turn, address the needs of the community. Clanwilliam has a population of approximately 7 674 persons and 2 363 households (Statistics SA: Census 2011). The town is primarily an agricultural service center with Rooibos tea and intensive citrus production being the predominant economic drivers for the town.

The Clanwilliam WWTP is currently equipped with two treatment modules, each comprising an oxidation ditch and a clarifier. The plant has a rated design capacity of 2400m^3/day according to the municipality. High level capacity calculations indicate that the plant is able to cope with a flow of 2400m^3/day, but at a limited organic load, with COD concentrations not exceeding 580mg/l. At a flow of 2100m^3/day, an organic concentration of 650mg/l could be managed. Currently, the plant is receiving in the order of 2200m^3/day (94% of rated maximum) with a very high organic concentration of 978mg/l COD. The plant is not able to deal with this organic load for a variety of reasons, and this is reflected in the very poor Final Effluent analysis results. In the previous 15 months, the plant effluent did not comply with the General Limit values on even a single occasion.

The Cederberg Local Municipality is desirous to develop an additional 1 158 stands in Clanwilliam, for low-cost housing. These stands will contribute an additional 579m^3/day to the current flow to Clanwilliam WWTP. Given the current condition of the Clanwilliam WWTP, and the high strength sewage being received, the additional flow will not be able to be accommodated, unless funding is made available to repair and upgrade the existing works, to enable it to perform optimally.

The Clanwilliam WWTP treatment capacity must be extended. The correct long-term solution for the Clanwilliam WWTP being to add another module capable of treating wastewater for the expected 2030 population. This indicates an expansion capable to treat an additional 1 500m^3/day. The Clanwilliam Wastewater Treatment Plant will be expanded to a new rated treatment capacity of 3 600m^3/day. This project addresses the upgrade of both the future treatment capacity and the refurbishment of the existing mechanical and electrical equipment which have deteriorated over time due to age and normal wear and tear.

6. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development	[redacted]	NO	Please explain
Services upgrades required as indicated in the services and GLS engineers report.			
7. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?	YES	[redacted]	Please explain
Services upgrades required as indicated in the services and GLS engineers report.			
8. Is this project part of a national programme to address an issue of national concern or importance?	[redacted]	NO	Please explain
However, it is a housing project to supply houses and services.			
9. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	[redacted]	Please explain
The direct community needs are for low-cost housing, which is a serious and urgent need. In order to unlock funding for the construction of these houses, the Cederberg Municipality must be capable to deliver a long-term sustainable sanitation service for the new houses as well as			

the rest of the Clanwilliam residents. This project aims to put infrastructure in place, to allow Cederberg Municipality to provide this service, and in turn, address the needs of the community. Clanwilliam has a population of approximately 7 674 persons and 2 363 households (Statistics SA: Census 2011). The town is primarily an agricultural service center with Rooibos tea and intensive citrus production being the predominant economic drivers for the town.

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10. How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	Please explain

The project area was comprehensively surveyed for heritage resources. Some Later Stone Age archaeology of limited scientific value was identified. However, the majority of the significant heritage resources identified relate to the historic development of Clanwilliam. None of the heritage resources identified fall within the area proposed for development and as such, no direct impact to significant heritage resources is anticipated.
The proposed development site is predominantly underlain by the Nardouw Subgroup, specifically the Rietvlei Formation. Both the Nardouw Subgroup and the Rietvlei Formation are characterised by low palaeontological sensitivity, as they generally do not contain fossils of significant scientific or heritage value. This conclusion aligns with previous studies, which have consistently indicated that these formations are not typically rich in palaeontological resources.
The potential impact of the proposed development on palaeontological resources is assessed as minimal, with a low likelihood of encountering any significant fossil material during construction. Additionally, the Goudini, Skurweberg, and Rietvlei Formations, which are also present in the broader area, share similarly low palaeontological sensitivity. As a result, no specific mitigation measures are required for the proposed residential development. While no specific mitigation strategies are required, it is recommended that the Chance Fossil Finds Procedure be implemented during the construction phase. This protocol will ensure that any

unexpected fossil discoveries are promptly reported and appropriately managed, safeguarding potential heritage resources. In order to ensure that no impact to heritage resources occurs during the construction or operational phases of the development, recommendations are made below.

RECOMMENDATIONS

There is no objection to the proposed development from an archaeological perspective on condition that:

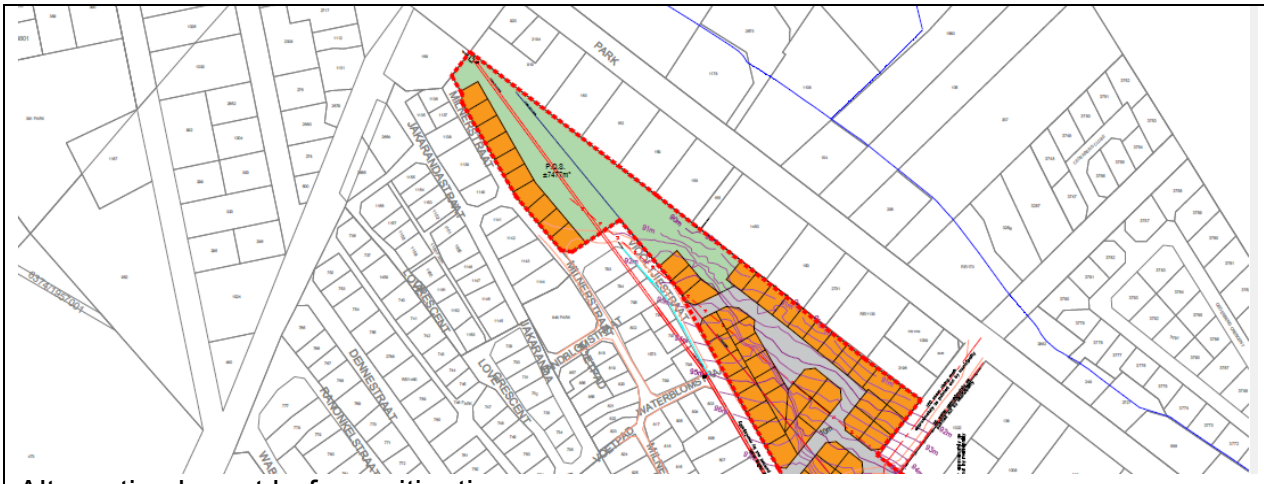
The attached Chance Fossil Finds Procedure is implemented for the duration of construction activities

Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order to retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space. This would require the reallocation of approximately 50 GAP housing erven.

This was mitigated in the preferred layout. See screen shots below of the area

Preferred layout accommodating mitigation measures



Alternative layout before mitigation

- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Due to the position of the proposed development between two areas that have been identified as having heritage value, additional design detail be submitted to HWC for approval as a condition of a positive comment on this HIA. The architecture of the proposed development should adhere to the Guidelines included as Appendix 3.
- The attached Chance Fossil Finds Procedure is implemented for the duration of construction activities
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.

11. How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc)?			Please explain
Will not affect people's health. Will provide much needed housing and services that will improve peoples health.			
12. Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?		NO	Please explain
Will provide much needed housing and services.			
13. What will the cumulative impacts (positive and negative) of the proposed land use associated with the activity applied for, be?			Please explain
Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments already on the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.			
14. Is the development the best practicable environmental option for this land/site?	YES		Please explain
Sensitive areas were identified and excluded from the developable areas. These areas are incorporated into the proposed development plan to avoid these areas.			
15. What will the benefits be to society in general and to the local communities?			Please explain

The benefits of the proposed development are significant. Will provide much needed housing and services.	
16. Any other need and desirability considerations related to the proposed activity?	Please explain
N/A	

SECTION 3: ALTERNATIVES ASSESSED AND OUTCOMES RELATING TO THE PREFFERED ALTERNATIVE/S

*"**alternatives**", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –*

(a) the property on which or location where it is proposed to undertake the activity (alternative properties as well as alternative sites on the same property)*;*
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity (consideration of such alternatives is to include the option of achieving the same goal by using a different method or process)*; and*
(e) the operational aspects of the activity;

The no-go option, i.e. the option of not implementing the activity has to be considered as well.

3.1 ALTERNATIVE DETERMINATION METHODOLOGY

Alternatives are described in terms of the various types of alternatives ("alternative types") as listed above, as well as the proposed and alternative project activity(ies) ("project alternatives") which includes a combination of all the separate factors. Both the identification, investigation, and assessment of alternatives, and the generation and consideration of modifications and changes to activities must be well documented. A reasoned explanation as to why an alternative was or was not found to be reasonable and feasible has been provided for each alternative type. The following criteria were used during the consideration of alternatives.

Table 4: Criteria used for assessing alternatives

Criteria	Description / methodology
Identification of alternatives	Alternatives have been identified as early as possible in the process (planning and design phase). Alternatives will further be considered and assessed throughout the project life as amendments to the alternatives are made. Assessment of the alternatives will only cease once final alternatives have been decided upon. These will be the final alternatives for which Environmental Authorisation will be applied for. The identification of alternatives should be broad, objectively done and well documented
Comparative assessment	The project alternatives will be determined according to the alternative types identified as feasible and reasonable and assessed comparatively.
Reasonability and feasibility	All alternatives were considered in terms of reasonability and feasibility. As determined throughout the process, not all alternatives will be reasonable or feasible. These will in subsequent reports be mentioned as being considered but will not be described in detail.
Sustainability considerations and effectiveness of alternatives	The alternatives identified have taken into account the triple bottom-line of sustainability i.e. meeting the socio-economic and ecological needs of the public. The alternatives aim to maximise the benefits and avoid or minimise the negative impacts. The primary objective has been to avoid all negative impacts (where possible), rather than to minimise them. The alternatives further took into consideration the need to maximise resource use efficiency.

Criteria	Description / methodology
Discrete vs. incremental alternatives	Initial alternatives identified, also known as discrete alternatives were identified during the early stages of a project (pre-feasibility and feasibility) and comparatively assessed during the assessment phases. During subsequent consideration, as the project progressed, incremental modifications and changes to activities have occurred. These incremental changes have been considered during the amendment to the project activities during project progression. Impacts and issues of these changes have also been considered, as and when they are identified
Advantages and disadvantages	For each alternative, the related advantages and disadvantages have been considered for each alternative type. These have not been discussed in terms of the project alternatives.
Impacts and aspects	Impacts and aspects related to the implementation of each alternative are listed with the alternative type descriptions. Detailed impacts are described in Section 7 for each project alternative. The aim is to address the key impacts of the proposed alternative by maximising benefits and avoiding or minimising the negative impacts. The primary objective must be to avoid all negative impacts, rather than to minimise them.
Other considerations	The "feasibility" and "reasonability" of and the need for alternatives was determined by considering, amongst others: (a) the general purpose and requirements of the activity; (b) need and desirability; (c) opportunity costs; (d) the need to avoid negative impact altogether; (e) the need to minimise unavoidable negative impacts; (f) the need to maximise benefits;, and (g) the need for equitable distributional consequences. Also refer to Section 5 for a detailed description of the need and desirability of the project.
I&APs	I&APs have to be notified of both the preferred and alternative activities. They should also be allowed to comment on both.
No-go option	The option of not implementing the activity has been assessed to the same level of detail as the other feasible and reasonable alternatives.

3.2 ROLE OF THE VARIOUS PARTIES IN THE CONSIDERATION OF ALTERNATIVES

The role of the Applicant according to the Regulations, *inter alia*, is to:

- Consider the strategic planning and environmental context within which the development and alternatives are to be considered;
- Consider all feasible and reasonable alternatives (not only the preferred option); and
- Provide the EAP with access to all information at the disposal of the applicant regarding the application.

The role of the EAP according to the Regulations, *inter alia*, is to:

- Consider the strategic planning and environmental context within which the development and alternatives are to be considered;
- Identify, investigate and assess alternatives;
- Afford opportunities for interested and affected parties to provide input into the identification, investigation and assessment of alternatives;
- Disclose all information relevant to the consideration of alternatives to the applicant and competent authority;
- Document the process of identification, investigation and assessment of alternatives (including providing the methodology and criteria used, and how the level of investigation applied to each alternative was established); and

- Provide a comprehensive consideration of the impacts of each of the alternatives assessed.

The role of I&APs in terms of the Regulations, inter alia, is to:

- Declare their interests;
- Assist in the identification, investigation and assessment of alternatives, particularly where local knowledge is required;
- Within the specified timeframes, provide comment on the consideration of alternatives.

The alternatives considered for this project are described below.

3.3 PROPERTY/LOCATION ALTERNATIVES

Clanwilliam is situated in the West Coast District Municipality of the Western Cape Province. The town falls under the jurisdiction of the Cederberg Local Municipality for local government purposes. Clanwilliam is the largest town in the Cederberg Municipality. Clanwilliam is situated at an elevation of 100 meters above mean sea level, between the western slopes of the Cederberg mountains and the east bank of the Olifants River, which is impounded nearby by the Clanwilliam Dam. It is situated at the foot of the Cedarberg Range where the Jan Dissels River flows into the broad Olifants River. Clanwilliam is located just off the N7 national road, which runs from Cape Town to the Namibian border. Clanwilliam is 230 kilometres from Cape Town by road.

The development is on a portion of remainder of Erf 279, Clanwilliam, which is situated on the south, south east and south western section of the town.

The sites are accessed via streets in town, especially Disa Avenue, Heuningtee Street, Bloekom Avenue and Ou Kaapse Weg. Property SG code is C02000020000027900000.

Preferred Alternative (refer to Appendix B)

Cederberg Municipality for the Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:
Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 126 Single Residential Zone 1 erven - Average erf size: ±208m²
- 692 Single Residential Zone 2 erven - Average erf size: ±150m²
- 13 Open Space Zone 1 erven
- 5 Community Zone II (church) erven
- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT

- 459 Single Residential Zone II erven - Average erf size: ±120m²

- 4 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day.

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. The upgrade comprises refurbishment of the existing equipment, a lined night storage pond, a new 1.5 Ml/day activated sludge reactor and clarifier, and a new chlorine contact tank, giving a new rated treatment capacity of 3 600 m³/day, with the works intended to treat at least 3 600 m³/day on a constant basis during peak conditions. The night storage pond (about 1 500 m³) holds peak flows for treatment during off-peak periods; BVi (2024) refers to it as a 500 m³/day short-term increase in capacity, but it does not add treatment capacity. It is designed to meet the Special Limit Values, including COD below 30 mg/l, ammonia below 2 mg/l and phosphate below 1 mg/l (BVi, 2024).

With a total Development footprint of ±49.6ha

Water Services
The existing water reticulation system of the Cederville reservoir water distribution zone has insufficient capacity to accommodate the proposed development.

Network upgrade
- Item 1 – 190m x 200mm diameter; replace existing 160mm pipe
- Item 2 – 90m x 160m diameter; replace existing 75mm pipe
- Item 3 – 285m x 160mm diameter internal water pipes
- Item 4 – 550mm x 160mm diameter internal water pipes
- CCIW2.1 – 220m x 315mm new supply pipe
- CCIW2.2 – 320m x 315mm; replace existing 75mm pipe
- CCIW2.3 – 260m x 315mm; replace existing 75mm pipe
- CCIW2.6 – 190m x 110mm new supply pipe

Reservoir
- CCIW.B1: 3 000 kL additional storage capacity for Cederville reservoir site
- CCIW.B12: 90 m x 315 mm Ø New feeder pipe to Cederville no. 2 reservoir
- CCIW.B16: 90 m x 315 mm Ø link pipe between Cederville no. 1 & 2 reservoirs
- CCIW.B17: 5 m x 160 mm Ø inter-connection pipe between 2x bulk pipes

Sewer Services
- CCIS6.1 – 380 m x 450 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS6.2 – 950 m x 200 mm Ø Upgrade existing 160 mm Ø outfall sewer
- CCIS6.3 – 475 m x 525 mm Ø Upgrade existing 150 mm Ø bulk sewer
- CCIS2.2 – 370 m x 200 mm Ø Upgrade existing 150 mm Ø outfall sewer

- CCIS2.3 – Upgrade capacity of Milner Street PS to 55 L/s
- CCIS2.4 – 780 m x 315 mm Ø Upgrade existing 200 mm Ø rising main
- CCIS4.1 – 260 m x 200 mm Ø New outfall sewer
- CCIS4.2 – 270 m x 250 mm Ø New outfall sewer
- CCIS4.3 – 350 m x 200 mm Ø New outfall sewer
- CCIS4.4 – New 20 L/s Future PS Cl2
- CCIS4.5 – 1 005 m x 160 mm Ø New rising main

For the development of Area A the following upgrades are required:
- Master plan items CCIS6.2 & CCIS6.3 to reinforce the capacity of the existing gravity system
- between the proposed development and the Clanwilliam WWTP.
- Link services items CCIS4.1 & CCIS4.2 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.
- A small portion of the development drains towards the existing Milner Street PS, which discharges into the Clanwilliam Gravity drainage areas. The bulk sewer downstream of the Milner Street PS is at capacity and should be upgraded (master plan items CCIS6.1 & CCIS6.3).
- The existing Milner Street PS drainage area has spare capacity to accommodate the erven within development area A which drains towards the Milner Street PS. In the sewer master plan for Clanwilliam upgrading of the Milner Street PS and accommodating rising main is however proposed (refer to master plan items CCIS2.3 & CCIS2.4), as well as upgrading of the main outfall sewer gravitating toward the Milner Street PS (refer to master plan item CCIS2.2). It can be considered to upgrade the PS, rising main and outfall sewer (master plan items CCIS2.2, CCIS2.3 & CCIS2.4) as part of the construction of the development as these items runs through the development area.

For the development of Area B the following upgrades are required:
- Link services items CCIS4.2 & CCIS4.3 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.

Stormwater

An underground piped stormwater system will be provided to accommodate for the minor storm events (up to RI 1: 5 years). The major storm events will be accommodated within the street reserves. Stormwater run-off will be channelled to the existing Jan Dissels River flowing to the east of the proposed development using existing non-perennial river after it was detained and controlled released on an open space erf specifically created for stormwater control inside the development. Six other outlets on the eastern side will be constructed where stormwater pipe outlets will release stormwater next to roads and infrastructure. The degraded wetland on the western side and north of the WWTW with its greater open space area will be used to collect the existing stormwater released from the development on the western edge and other generated stormwater on the development. Building rubble and litter, as well as alien invasive trees will be controlled and eradicated from this area.

The stormwater infrastructure, comprising 21 headwalls, four attenuation ponds and a piped connection within the central valley-bottom wetland system, and the

refurbishment and expansion of the WWTW, with a new 1.5 Ml/day module and the upgraded works intended to treat at least 3.6 Ml/day at peak, were assessed. With mitigation, the construction impacts and the operational impacts of the stormwater system are of Low significance. Combined with the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026), the stormwater design offers an opportunity to improve the central wetland, which currently receives untreated stormwater from the informal settlement and township.

Stormwater will be collected by kerb inlets and underground pipes designed for the 1:5-year event, with larger events conveyed in the road reserves, and discharged through headwalls into the retained wetland system and towards the Jan Dissels River (UDS Africa, 2026b; Enviro-EAP, 2026) (**Figure 2-2**). The conceptual layout showed 10 headwalls, most discharging towards the Jan Dissels River, two directly into the wetland and two upstream of it (UDS Africa, 2026a). The tender-stage layout has 21 numbered headwalls, with design discharges of 17 to 843 l/s through 375 to 750 mm pipes, and four attenuation ponds (Ponds 1, 2, 6 and 7) (UDS Africa, 2026b). Overflow from Wetland 1 to Wetland 2 (both form part of the unchannelled valley-bottom wetland system) will be piped beneath the golf course.

The ponds were sized with the Abt and Grigg method to attenuate the 1:100-year peak inflow to the post- development 1:2-year flood peak (UDS Africa, 2026b). Pond 7, the largest, provides 4 853 m³ of storage against 2 913 m³ required and reduces a 1:100-year inflow of 5 863 l/s to 209 l/s. Pond 1's designed outflow (417 l/s) is marginally above its allowable rate (410 l/s). Each pond outlet is a field inlet or headwall with an open top for emergency overflow.

Roads
Access to the proposed development will be provided from the existing Bloekom Avenue, south of the proposed development, Denne and Buitekant Street to the west and from Oranje, Protea and Viooltjie Streets to the north. The internal roads (main access road 16m wide and other internal roads 10m wide) will consist of surfaced streets.

Coordinates of the proposed site(s) for all alternatives: Housing Project East			
Latitude (S)	32º	11‘	29.28“
Longitude (E)	18º	53‘	55.60“

Coordinates of the proposed site(s) for all alternatives: Housing Project West			
Latitude (S)	32º	11‘	38.46“
Longitude (E)	18º	53‘	28.64“

Coordinates of the proposed site(s) for all alternatives: WWTW expansion			
Latitude (S)	32º	11‘	41.87“
Longitude (E)	18º	54‘	04.82“

Linear development Starting point co-ordinates for road			
Latitude (S)	32º	11‘	09.28“

Longitude (E)	18º	53‘	50.54“
Linear development Middle point co-ordinates for road			
Latitude (S)	32º	11‘	15.29“
Longitude (E)	18º	53‘	56.68“
Linear development Middle point co-ordinates for road			
Latitude (S)	32º	11‘	20.87“
Longitude (E)	18º	54‘	01.54“
Linear development Middle point co-ordinates for road			
Latitude (S)	32º	11‘	25.67“
Longitude (E)	18º	53‘	57.90“
Linear development Middle point co-ordinates for road			
Latitude (S)	32º	11‘	27.51“
Longitude (E)	18º	53‘	56.90“
Linear development End point co-ordinates for road			
Latitude (S)	32º	11‘	27.06“
Longitude (E)	18º	54‘	12.19“

Linear development Starting point co-ordinates for sewer and stormwater			
Latitude (S)	32º	11‘	16.96“
Longitude (E)	18º	54‘	13.77“
Linear development Middle point co-ordinates for sewer and stormwater			
Latitude (S)	32º	11‘	19.34“
Longitude (E)	18º	54‘	08.56“
Linear development Middle point co-ordinates for sewer and stormwater			
Latitude (S)	32º	11‘	24.84“
Longitude (E)	18º	54‘	01.75“
Linear development End point co-ordinates for sewer and stormwater			
Latitude (S)	32º	11‘	27.01“
Longitude (E)	18º	54‘	01.33“

3.4 ACTIVITY ALTERNATIVES

The only activity alternatives are for the housing project and upgrade of the WWTW. There is no other feasible or reasonable activity alternatives. The direct community needs are for low-cost housing, which is a serious and urgent need. In order to unlock funding for the construction of these houses, the Cederberg Municipality must be capable to deliver a long-term sustainable sanitation service for the new houses as well as the rest of the Clanwilliam residents. This project aims to put infrastructure in place, to allow Cederberg Municipality to provide this service, and in turn, address the needs of the community.

Cederberg Municipality for the Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:
Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 126 Single Residential Zone 1 erven - Average erf size: ±208m²
- 692 Single Residential Zone 2 erven - Average erf size: ±150m²
- 13 Open Space Zone 1 erven

- 5 Community Zone II (church) erven
- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT
- 459 Single Residential Zone II erven - Average erf size: ±120m²
- 4 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day.

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. The upgrade comprises refurbishment of the existing equipment, a lined night storage pond, a new 1.5 Ml/day activated sludge reactor and clarifier, and a new chlorine contact tank, giving a new rated treatment capacity of 3 600 m³/day, with the works intended to treat at least 3 600 m³/day on a constant basis during peak conditions. The night storage pond (about 1 500 m³) holds peak flows for treatment during off-peak periods; BVi (2024) refers to it as a 500 m³/day short-term increase in capacity, but it does not add treatment capacity. It is designed to meet the Special Limit Values, including COD below 30 mg/l, ammonia below 2 mg/l and phosphate below 1 mg/l (BVi, 2024).

With a total Development footprint of ±49.6ha

Water Services
The existing water reticulation system of the Cederville reservoir water distribution zone has insufficient capacity to accommodate the proposed development.

Network upgrade
- Item 1 – 190m x 200mm diameter; replace existing 160mm pipe
- Item 2 – 90m x 160m diameter; replace existing 75mm pipe
- Item 3 – 285m x 160mm diameter internal water pipes
- Item 4 – 550mm x 160mm diameter internal water pipes
- CCIW2.1 – 220m x 315mm new supply pipe
- CCIW2.2 – 320m x 315mm; replace existing 75mm pipe
- CCIW2.3 – 260m x 315mm; replace existing 75mm pipe
- CCIW2.6 – 190m x 110mm new supply pipe

Reservoir

- CCIW.B1: 3 000 kL additional storage capacity for Cederville reservoir site
- CCIW.B12: 90 m x 315 mm Ø New feeder pipe to Cederville no. 2 reservoir
- CCIW.B16: 90 m x 315 mm Ø link pipe between Cederville no. 1 & 2 reservoirs
- CCIW.B17: 5 m x 160 mm Ø inter-connection pipe between 2x bulk pipes

Sewer Services

- CCIS6.1 – 380 m x 450 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS6.2 – 950 m x 200 mm Ø Upgrade existing 160 mm Ø outfall sewer
- CCIS6.3 – 475 m x 525 mm Ø Upgrade existing 150 mm Ø bulk sewer
- CCIS2.2 – 370 m x 200 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS2.3 – Upgrade capacity of Milner Street PS to 55 L/s
- CCIS2.4 – 780 m x 315 mm Ø Upgrade existing 200 mm Ø rising main
- CCIS4.1 – 260 m x 200 mm Ø New outfall sewer
- CCIS4.2 – 270 m x 250 mm Ø New outfall sewer
- CCIS4.3 – 350 m x 200 mm Ø New outfall sewer
- CCIS4.4 – New 20 L/s Future PS Cl2
- CCIS4.5 – 1 005 m x 160 mm Ø New rising main

For the development of Area A the following upgrades are required:

- Master plan items CCIS6.2 & CCIS6.3 to reinforce the capacity of the existing gravity system
- between the proposed development and the Clanwilliam WWTP.
- Link services items CCIS4.1 & CCIS4.2 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.
- A small portion of the development drains towards the existing Milner Street PS, which discharges into the Clanwilliam Gravity drainage areas. The bulk sewer downstream of the Milner Street PS is at capacity and should be upgraded (master plan items CCIS6.1 & CCIS6.3).
- The existing Milner Street PS drainage area has spare capacity to accommodate the erven within development area A which drains towards the Milner Street PS. In the sewer master plan for Clanwilliam upgrading of the Milner Street PS and accommodating rising main is however proposed (refer to master plan items CCIS2.3 & CCIS2.4), as well as upgrading of the main outfall sewer gravitating toward the Milner Street PS (refer to master plan item CCIS2.2). It can be considered to upgrade the PS, rising main and outfall sewer (master plan items CCIS2.2, CCIS2.3 & CCIS2.4) as part of the construction of the development as these items runs through the development area.

For the development of Area B the following upgrades are required:

- Link services items CCIS4.2 & CCIS4.3 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.

Stormwater

An underground piped stormwater system will be provided to accommodate for the minor storm events (up to RI 1: 5 years). The major storm events will be accommodated within the street reserves. Stormwater run-off will be channelled to the existing Jan Dissels River flowing to the east of the proposed development using existing non-

perennial river after it was detained and controlled released on an open space erf specifically created for stormwater control inside the development. Six other outlets on the eastern side will be constructed where stormwater pipe outlets will release stormwater next to roads and infrastructure. The degraded wetland on the western side and north of the WWTW with its greater open space area will be used to collect the existing stormwater released from the development on the western edge and other generated stormwater on the development. Building rubble and litter, as well as alien invasive trees will be controlled and eradicated from this area.

The stormwater infrastructure, comprising 21 headwalls, four attenuation ponds and a piped connection within the central valley-bottom wetland system, and the refurbishment and expansion of the WWTW, with a new 1.5 Ml/day module and the upgraded works intended to treat at least 3.6 Ml/day at peak, were assessed. With mitigation, the construction impacts and the operational impacts of the stormwater system are of Low significance. Combined with the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026), the stormwater design offers an opportunity to improve the central wetland, which currently receives untreated stormwater from the informal settlement and township.

Stormwater will be collected by kerb inlets and underground pipes designed for the 1:5-year event, with larger events conveyed in the road reserves, and discharged through headwalls into the retained wetland system and towards the Jan Dissels River (UDS Africa, 2026b; Enviro-EAP, 2026) (**Figure 2-2**). The conceptual layout showed 10 headwalls, most discharging towards the Jan Dissels River, two directly into the wetland and two upstream of it (UDS Africa, 2026a). The tender-stage layout has 21 numbered headwalls, with design discharges of 17 to 843 l/s through 375 to 750 mm pipes, and four attenuation ponds (Ponds 1, 2, 6 and 7) (UDS Africa, 2026b). Overflow from Wetland 1 to Wetland 2 (both form part of the unchannelled valley-bottom wetland system) will be piped beneath the golf course.

The ponds were sized with the Abt and Grigg method to attenuate the 1:100-year peak inflow to the post- development 1:2-year flood peak (UDS Africa, 2026b). Pond 7, the largest, provides 4 853 m³ of storage against 2 913 m³ required and reduces a 1:100-year inflow of 5 863 l/s to 209 l/s. Pond 1's designed outflow (417 l/s) is marginally above its allowable rate (410 l/s). Each pond outlet is a field inlet or headwall with an open top for emergency overflow.

Roads
Access to the proposed development will be provided from the existing Bloekom Avenue, south of the proposed development, Denne and Buitekant Street to the west and from Oranje, Protea and Viooltjie Streets to the north. The internal roads (main access road 16m wide and other internal roads 10m wide) will consist of surfaced streets.

3.5 DESIGN/LAYOUT ALTERNATIVES

Several housing layout design alterative were considered. Refer to Appendix B for more detail

Alternative layout (Refer to Appendix B)

Alternative to be assessed by all specialist is the proposed Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:

Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 160 Single Residential Zone 1 erven - Average erf size: ±208m²
- 692 Single Residential Zone 2 erven - Average erf size: ±150m²
- 21 Open Space Zone 1 erven
- 13 Open Space Zone 1 erven
- 6 Community Zone II (church) erven
- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT

- 457 Single Residential Zone II erven - Average erf size: ±120m²
- 2 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day.

With a total Development footprint of ±49.6ha

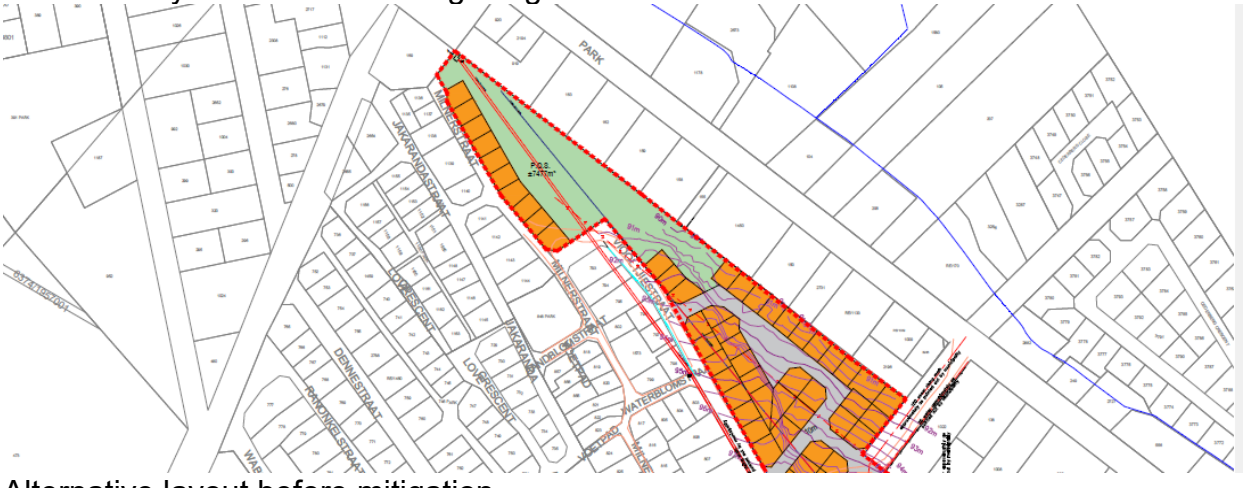
Preferred Alternative (Refer to Appendix B)

The preferred alternative was developed to address Heritage Western Cape comments and recommendations as described below.

The open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order to retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space. This would require the reallocation of approximately 50 GAP housing erven, which was relocated to the south.

See screen shots below of the area

Preferred layout accommodating mitigation measures



Alternative layout before mitigation

Cederberg Municipality for the Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:
Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 126 Single Residential Zone 1 erven - Average erf size: ±208m²
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- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT

- 459 Single Residential Zone II erven - Average erf size: ±120m²
- 4 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day.

Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. The upgrade comprises refurbishment of the existing equipment, a lined night storage pond, a new 1.5 Ml/day activated sludge reactor and clarifier, and a new chlorine contact tank, giving a new rated treatment capacity of 3 600 m³/day, with the works intended to treat at least 3 600 m³/day on a constant basis during peak conditions. The night storage pond (about 1 500 m³) holds peak flows for treatment during off-peak periods; BVi (2024) refers to it as a 500 m³/day short-term increase in capacity, but it does not add treatment capacity. It is designed to meet the Special Limit Values, including COD below 30 mg/l, ammonia below 2 mg/l and phosphate below 1 mg/l (BVi, 2024).

With a total Development footprint of ±49.6ha

Water Services

The existing water reticulation system of the Cederville reservoir water distribution zone has insufficient capacity to accommodate the proposed development.

Network upgrade

- Item 1 – 190m x 200mm diameter; replace existing 160mm pipe
- Item 2 – 90m x 160m diameter; replace existing 75mm pipe
- Item 3 – 285m x 160mm diameter internal water pipes
- Item 4 – 550mm x 160mm diameter internal water pipes
- CCIW2.1 – 220m x 315mm new supply pipe
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- CCIW2.6 – 190m x 110mm new supply pipe

Reservoir

- CCIW.B1: 3 000 kL additional storage capacity for Cederville reservoir site
- CCIW.B12: 90 m x 315 mm Ø New feeder pipe to Cederville no. 2 reservoir
- CCIW.B16: 90 m x 315 mm Ø link pipe between Cederville no. 1 & 2 reservoirs
- CCIW.B17: 5 m x 160 mm Ø inter-connection pipe between 2x bulk pipes

Sewer Services

- CCIS6.1 – 380 m x 450 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS6.2 – 950 m x 200 mm Ø Upgrade existing 160 mm Ø outfall sewer
- CCIS6.3 – 475 m x 525 mm Ø Upgrade existing 150 mm Ø bulk sewer

- CCIS2.2 – 370 m x 200 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS2.3 – Upgrade capacity of Milner Street PS to 55 L/s
- CCIS2.4 – 780 m x 315 mm Ø Upgrade existing 200 mm Ø rising main
- CCIS4.1 – 260 m x 200 mm Ø New outfall sewer
- CCIS4.2 – 270 m x 250 mm Ø New outfall sewer
- CCIS4.3 – 350 m x 200 mm Ø New outfall sewer
- CCIS4.4 – New 20 L/s Future PS Cl2
- CCIS4.5 – 1 005 m x 160 mm Ø New rising main

For the development of Area A the following upgrades are required:

- Master plan items CCIS6.2 & CCIS6.3 to reinforce the capacity of the existing gravity system
- between the proposed development and the Clanwilliam WWTP.
- Link services items CCIS4.1 & CCIS4.2 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.
- A small portion of the development drains towards the existing Milner Street PS, which discharges into the Clanwilliam Gravity drainage areas. The bulk sewer downstream of the Milner Street PS is at capacity and should be upgraded (master plan items CCIS6.1 & CCIS6.3).
- The existing Milner Street PS drainage area has spare capacity to accommodate the erven within development area A which drains towards the Milner Street PS. In the sewer master plan for Clanwilliam upgrading of the Milner Street PS and accommodating rising main is however proposed (refer to master plan items CCIS2.3 & CCIS2.4), as well as upgrading of the main outfall sewer gravitating toward the Milner Street PS (refer to master plan item CCIS2.2). It can be considered to upgrade the PS, rising main and outfall sewer (master plan items CCIS2.2, CCIS2.3 & CCIS2.4) as part of the construction of the development as these items runs through the development area.

For the development of Area B the following upgrades are required:

- Link services items CCIS4.2 & CCIS4.3 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.

Stormwater

An underground piped stormwater system will be provided to accommodate for the minor storm events (up to RI 1: 5 years). The major storm events will be accommodated within the street reserves. Stormwater run-off will be channelled to the existing Jan Dissels River flowing to the east of the proposed development using existing non-perennial river after it was detained and controlled released on an open space erf specifically created for stormwater control inside the development. Six other outlets on the eastern side will be constructed where stormwater pipe outlets will release stormwater next to roads and infrastructure. The degraded wetland on the western side and north of the WWTW with its greater open space area will be used to collect the existing stormwater released from the development on the western edge and other generated stormwater on the development. Building rubble and litter, as well as alien invasive trees will be controlled and eradicated from this area.

The stormwater infrastructure, comprising 21 headwalls, four attenuation ponds and a piped connection within the central valley-bottom wetland system, and the refurbishment and expansion of the WWTW, with a new 1.5 Ml/day module and the upgraded works intended to treat at least 3.6 Ml/day at peak, were assessed. With mitigation, the construction impacts and the operational impacts of the stormwater system are of Low significance. Combined with the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026), the stormwater design offers an opportunity to improve the central wetland, which currently receives untreated stormwater from the informal settlement and township.

Stormwater will be collected by kerb inlets and underground pipes designed for the 1:5-year event, with larger events conveyed in the road reserves, and discharged through headwalls into the retained wetland system and towards the Jan Dissels River (UDS Africa, 2026b; Enviro-EAP, 2026) (**Figure 2-2**). The conceptual layout showed 10 headwalls, most discharging towards the Jan Dissels River, two directly into the wetland and two upstream of it (UDS Africa, 2026a). The tender-stage layout has 21 numbered headwalls, with design discharges of 17 to 843 l/s through 375 to 750 mm pipes, and four attenuation ponds (Ponds 1, 2, 6 and 7) (UDS Africa, 2026b). Overflow from Wetland 1 to Wetland 2 (both form part of the unchannelled valley-bottom wetland system) will be piped beneath the golf course.

The ponds were sized with the Abt and Grigg method to attenuate the 1:100-year peak inflow to the post- development 1:2-year flood peak (UDS Africa, 2026b). Pond 7, the largest, provides 4 853 m³ of storage against 2 913 m³ required and reduces a 1:100-year inflow of 5 863 l/s to 209 l/s. Pond 1's designed outflow (417 l/s) is marginally above its allowable rate (410 l/s). Each pond outlet is a field inlet or headwall with an open top for emergency overflow.

Roads
Access to the proposed development will be provided from the existing Bloekom Avenue, south of the proposed development, Denne and Buitekant Street to the west and from Oranje, Protea and Viooltjie Streets to the north. The internal roads (main access road 16m wide and other internal roads 10m wide) will consist of surfaced streets.

The preferred layout was also amended to remove the sewer pipeline, pump station and access road as assessed by the EnviroSwift delineation of wetlands to protect and mitigate impacts on the delineated wetlands.

3.6 TECHNOLOGY ALTERNATIVES

The only technological alternatives assessed and considered, were the use of electricity and water conservation.

Electricity:
Use of energy efficient equipment;
CFL's must be used to save energy cost where possible;
Fluorescent lighting must be used in communal spaces where possible.
The only technological alternatives assessed and considered, were the use of water conservation:
Ensure that toilet systems are duel flush and 6 litre water holding capacity.

No feasible or reasonable technology alternative for the WWTW exist due to the expansion of the existing WWTW and the technology it must link to and which is currently in use. Existing

pumps and equipment will be used.

3.7 OPERATIONAL ASPECTS ALTERNATIVES

Operational alternatives were assessed and the following reasonable and feasible management and mitigation measures were included in the EMPr.

Stormwater

These measures apply both to the new stormwater system and to the stormwater from the existing informal settlement and township that already flows into the central valley-bottom wetland system.

In operation: the municipality must inspect and clean inlets, litter traps, outlets, forebays and ponds at least quarterly and after large storms, remove sediment from forebays before they are half full and dispose of it off site, and repair erosion immediately.

Provide regular solid-waste collection in the informal settlement and township and clear dumped waste and tyres from the wetland, to reduce the litter and dumping that currently reach it.

Implement the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026): removal of waste and tyres, clearing of alien invasive plants (including Acacia saligna), stabilisation of eroded areas and replanting with indigenous wetland vegetation.

WWTW

Operate the works to the Special Limit Values in the water use licence, with working inlet, outlet and irrigation flow meters, backup power, spares, qualified process controllers and a supervisor (none was in place at the 2023/24 Green Drop audit; DWS, 2026), and the operation and maintenance plan proposed by BVi (2024).

Appoint a suitably qualified and experienced wastewater process engineer to oversee the commissioning of the refurbished and expanded works and to audit its functioning regularly, at least quarterly for the first two years of operation and thereafter at the interval set in the monitoring plan. The audits should cover process performance, effluent compliance, maintenance and staffing, and be reported in writing to the municipality and DWS.

Appoint a dedicated works manager (site manager), with the appropriate process controller qualifications, to oversee the daily operation and functioning of the works, keep operational records and report any failure or non-compliance immediately.

Before the new module is commissioned, increase operational support in line with the added capacity: process controllers and maintenance staff on every shift, a dedicated operation and maintenance budget, spares and a planned maintenance schedule. The expanded works will be more demanding to operate than the existing works, which has a long history of non-compliance.

Monitor the final effluent periodically through an accredited laboratory (see Monitoring below), and confirm that the refurbished works meets the Special Limit Values before the new module is commissioned. If a result exceeds a limit, investigate the cause, take corrective action and resample, and notify DWS as the water use licence requires.

Repair the chlorine contact channel so that no effluent bypasses disinfection (DWS, 2026), control residual chlorine in the final effluent (dechlorination or optimised dosing), and consider UV disinfection.

Retain the reed bed below the golf course as a polishing wetland: do not clear or canalise it, keep the effluent spread across it rather than in a single channel, and control alien invasive plants.

Provide enough storage and pumping capacity that effluent is not forced to overflow when the golf course is not taking it (DWS, 2026), and route any excess through the reed bed rather than directly to the river.

Prepare an irrigation management plan for the golf course: application matched to turf demand, no irrigation during rain or on saturated soils, setbacks from the wetland and river, and enough

storage to avoid forced winter discharge.
Before the new module is commissioned, prepare a water balance for the works (inflow, irrigation and discharge to the river, by month) for the current flow, the housing development and the full 3.6 Ml/day, as part of the water use licence application.
Switch the town's dry-season (December to March) potable water abstraction from the Jan Dissels River to Clanwilliam Dam where possible, as recommended by Van der Berg (2008), to help restore summer low flows in the lower river.
• Fit the new houses with water-efficient fittings (for example low-flow taps and showerheads and dual-flush toilets), to reduce both the potable water abstracted from the Jan Dissels River and the volume of effluent produced by the housing development.

Monitoring
Monitoring plan: before construction starts, a suitably qualified aquatic specialist and the appointed engineers must prepare a comprehensive monitoring plan for the stormwater system, the wetlands, the WWTW effluent and the Jan Dissels River, for inclusion in the EMPr and the water use licence application. It must set out the monitoring points, parameters, frequencies, thresholds that trigger management action, responsibilities and reporting, and include at least the measures below. It must include biomonitoring of the Jan Dissels River: aquatic macroinvertebrates (SASS5; Dickens and Graham, 2002) and fish (for example with the Fish Response Assessment Index; Kleynhans, 2007), upstream and downstream of the effluent release and of the wetland outflow.
Baseline: before construction starts, a suitably qualified aquatic specialist must undertake SASS5 and fish surveys of the Jan Dissels River at the monitoring sites upstream and downstream of the effluent release and the wetland outflow, to provide a baseline against which later monitoring is compared.
Final effluent: at the frequency required by the water use licence, and at least monthly, for the parameters in Table 4-9, analysed by an accredited laboratory, with the results reviewed by the process engineer and reported to the municipality and DWS.
Stormwater system: record each inspection, clean-out and repair of the litter traps, forebays, ponds and outlets, with photographs.
Effluent volumes: meter the total treated effluent, the volume drawn off for golf course irrigation (using the existing meter on the draw-off) and the volume released to the reed bed and the Jan Dissels River. Record these daily from commissioning of the new module, together with rainfall, and report them with the water use licence monitoring. After the first year, these records provide a measured water balance and show whether the upper-bound assumption in Section 5.2 holds.
Jan Dissels and Olifants rivers: water quality upstream and downstream of the effluent release, and in the Olifants River above and below the confluence, monthly for two years after commissioning, then quarterly, with field measurement of temperature, pH, EC and dissolved oxygen and with analytical detection limits below the aquatic ecosystem TWQRs (in particular for phosphate and trace metals); SASS5 and fish sampling twice a year (high and low flow) at the baseline sites. Fish sampling requires a CapeNature permit.
Wetlands: fixed-point photographs and an annual inspection of erosion at the outlets, and a repeat WET-Health assessment of the central valley-bottom wetland system three and five years after the stormwater system and rehabilitation are complete, to confirm progress towards the Recommended Ecological Category (D).
Southern seep: map the extent of the seep and reed bed annually, from aerial imagery or a field survey, and relate it to the volumes of effluent released, to track its expansion as flows increase.

3.8 NO-DEVELOPMENT ALTERNATIVE

The No-Go option will result in the site remaining as it is presently. This will result in the not being able to develop much needed housing opportunities or to expand the WWTW.

SECTION 4: PUBLIC PARTICIPATION PROCESS

4.1 INTRODUCTION

Public participation is an integral part of the environmental assessment process, and affords potentially interested and affected parties (I&APs) an opportunity to participate in the EIA process, or to comment on any aspect of the development proposals. The public participation process undertaken for this project complies with the requirements of the EIA Regulations. The description of the public participation process as included below itemizes the steps and actions undertaken to date and as appropriate at this stage of the project.

The public participation process for the project initiation and Scoping Report phase was outlined in detail in the Scoping Report and is summarised below for reference. The purpose of this chapter is to provide a detailed overview of the public participation envisaged for the EIA phase.

4.2 SCOPING PHASE PUBLIC PARTICIPATION

4.2.1 Identification and registration of key departments and other I&APs

Liaison with the relevant authorities plays a crucial role in the successful completion of any environmental assessment process. In addition to the DEA&DP, the key departments such as the provincial departments having jurisdiction in respect of any aspect of the project, the local municipality and municipal councillor as well as other potentially affected I&APs, including adjacent property owners and dwellers, were identified.

The parties listed in the table below were identified as key departments and registered I&APs to date as per the requirements of the Regulation 42 of R982 of 2014 as amended. A list with complete details of the key department and registered I&APs is kept and will be updated as the project progresses. Refer to Appendix D for further evidence and details on the public participation process followed to date and still to be followed.

Table 5: Key Departments & Registered I&AP's (Further details in Appendix D)

STAKEHOLDER	EMAIL ADDRESS
DEA&DP: Development Management Private Bag X9086 Cape Town 8000	DEADP EIA Admin <DEADPEIAAdmin@westerncape.gov.za>
CapeNature Private Bag X5014 Stellenbosch 7599	mwheeler@capenature.co.za 'iadams@capenature.co.za
DEA&DP: Pollution and Chemicals Management Private Bag X9086 Cape Town 8000	Arabel.McClelland@westerncape.gov.za

DEA&DP: Waste Management Private Bag X9086 Cape Town 8000	Saliem.Haider@westerncape.gov.za
Department of Agriculture, Western Cape: Land Use Private Bag X1 Elsenburg 7607	landuse.elsenburg@elsenburg.com ashraf.mohamed@westerncape.gov.za / hannes.pienaar@westerncape.gov.za.
Department of Water and Sanitation Private Bag X16 Sanlamhof 7532	ndobenin2@dws.gov.za DreyerW@dws.gov.za VisserK@dws.gov.za NieuwoudtR@dws.gov.za TorchT@dws.gov.za
Heritage Western Cape Private Bag X9067 Cape Town 8001	Ceoheritage@westerncape.gov.za
Cederberg Municipality	mm@cederberg.gov.za gerritm@cederberg.gov.za dannej@cederberg.gov.za
West Coast District Municipality PO Box 242 Moorreesburg 7380	westcoastdm@wcdm.co.za
Department of Infrastructure	Priscilla van As <Priscilla.VanAs@westerncape.gov.za>
Department: Transport and Public Works Western Cape Government PO Box 2603 Cape Town 8000	'HOD.TransportPublicWorks@westerncape.gov.za'

4.2.2 Notification of I&APs

Potential I&AP's were notified about the project in the following manner (proof thereof is available under Appendix D):

- Fixing notice boards at the boundary of the property;
- Placing an advertisement in the local newspaper; and
- Written notifications were sent to potential I&APs inviting them to register and give comments on the proposed development.

4.2.3 Public Meetings and Workshops

No public meetings and/or workshops have been held nor requested thus far.

4.2.4 Availability of the Scoping Report

As per the requirements of Regulation 43 of GN R982 of 2014 as amended, the draft Scoping Report was made available for a 30-day commenting period. A copy of the draft scoping report and EIR will be made available in the municipal offices.

The report will be included for statutory comment with the written notice as sent to the commenting organs of state.

Electronic copies (CDs) will be made available to any I&AP on request. Proof of delivery and document placement will be attached to the final Scoping Report. Additionally, the report will be made available to any I&AP upon request, as advised on the notice boards, notices and advertisements referred to in Section 5.3 above.

4.2.5 Comments and Reponses during the Scoping Phase and EIR Phases

All comments received were responded to during the draft and final scoping phases. During the draft EIR phase the comments as received were further addressed and all comments and responses are tabulated in Comments and Response Report Tables as available under Appendix D. The revised draft EIR was made available for a 30-day commenting period to all key departments and registered I&APs. All comments and responses are tabulated in Comments and Response Report Tables as available under Appendix D.

4.3 A SUMMARY OF THE ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES, AND AN INDICATION OF THE MANNER IN WHICH THE ISSUES WERE INCORPORATED, OR THE REASONS FOR NOT INCLUDING THEM

Refer to Appendix D for summaries of all comments received, response/s thereto and indication of how the issues/comments were addressed.

4.4 AVAILABILITY OF THE EIR

The draft EIR was made available to the registered I&AP's and Key Departments for a 30-day period to comment on the findings of the report. Proof of the Public Participation Process conducted during the EIR phase is included in the final EIR.

Proof of the Public Participation Process conducted during the EIR phase will be included in the Final EIR. Once all comments have been received, the EIR will be finalised taking into account the comments received and thereafter submitted to the DEA&DP for a final decision.

4.5 DECISION AND APPEAL PERIOD

Once the DEA&DP have reviewed the Final EIR and are satisfied that it contains sufficient information to make an informed decision, the DEA&DP will use the information contained within the Final EIR to determine the environmental acceptability of the proponent's preferred options. A decision on the applications and associated reports will be made by the DEA&DP based on the findings of the Final EIR.

Following the issuing of the decision, all key department and registered I&APS will be notified and afforded the opportunity to appeal the decision in terms of the NEMA.

4.6 SUMMARY OF ISSUES RAISED BY I&APS THUS FAR

Refer Appendix D: Public Participation Process for summaries of all comments received and response/s provided during the Scoping Phase. Proof of all comments received is also available under Appendix D.

The Environmental Management Plan (EMPr) should address the management of Alien Invasive species.
Dust and Noise impacts during construction
Pollution as a result of chemical spills and use of toilets.
Aquatic, Botanical and Terrestrial Biodiversity Impacts
Heritage Impacts
Traffic Impacts
Service availability and capacity
Stormwater management
Waste management

4.7 SPECIFIC INFORMATION THAT MAY BE REQUIRED BY THE COMPETENT AUTHORITY

Refer to Appendix D: Public Participation Process for summaries of all comments received and response/s provided. Proof of all comments received is also available under Appendix D.

4.8 ANY OTHER MATTERS REQUIRED IN TERMS OF SECTION 24(4)(A) AND (B) OF THE ACT

None at this stage.

SECTION 5: ENVIRONMENTAL ATTRIBUTES OF THE PROPOSED DEVELOPMENT SITE AS ASSESSED

The information for this section is mainly based on the specialist studies undertaken for this project. These studies are attached under Appendix E.

5.1 GEOGRAPHICAL, GEOLOGICAL AND PHYSICAL ASPECTS

Land Type: Ia196
Soil: Miscellaneous land classes, undifferentiated deep deposits
Geology: Alluvium and colluvium with mainly quartzitic sandstone of the Table Mountain Group and shale, siltstone and sandstone of the Bokkeveld Group.
Source: CapeFarmMapper dated 26 October 2023

Geohydrology
Groundwater Recharge
Recharge (mm/a): 14.97
Depth to Groundwater
Depth (mbgl): 12.47
Aquifer Type and Yield

Classification: Fractured 2.0 - 5.0 l/s Groundwater Quality EC (mS/m): 70 - 150 Source: CapeFarmMapper, dated 26 October 2023

5.2 BIOLOGICAL AND ECOLOGICAL ASPECTS

Will the proposed development and its alternatives have an impact on CBAs or ESAs? If yes, please explain:	YES	~~NO~~
Approximately 26ha was mapped as aquatic ESA's habitats in the Eastern Housing section and WWTW expansion area. The western housing areas is incorrectly mapped as an ESA. All vegetation and ecological functioning are loss as a result of the squatter activities. The vegetation that will be lost was not mapped under the WCBSP 2023 as a terrestrial Critical Biodiversity Area or Ecological Support area. Only as an Aquatic Ecological Support Area in terms of ground water protection. The Department of Water and Sanitation did not raise any comment or concern on impacts on ground water as a result of the development. Because the vegetation has a least threatened ecosystem protection status, was not mapped as terrestrial CBA or ESA and no species of conservation concern was mapped, no biodiversity offset as mitigation is required.		

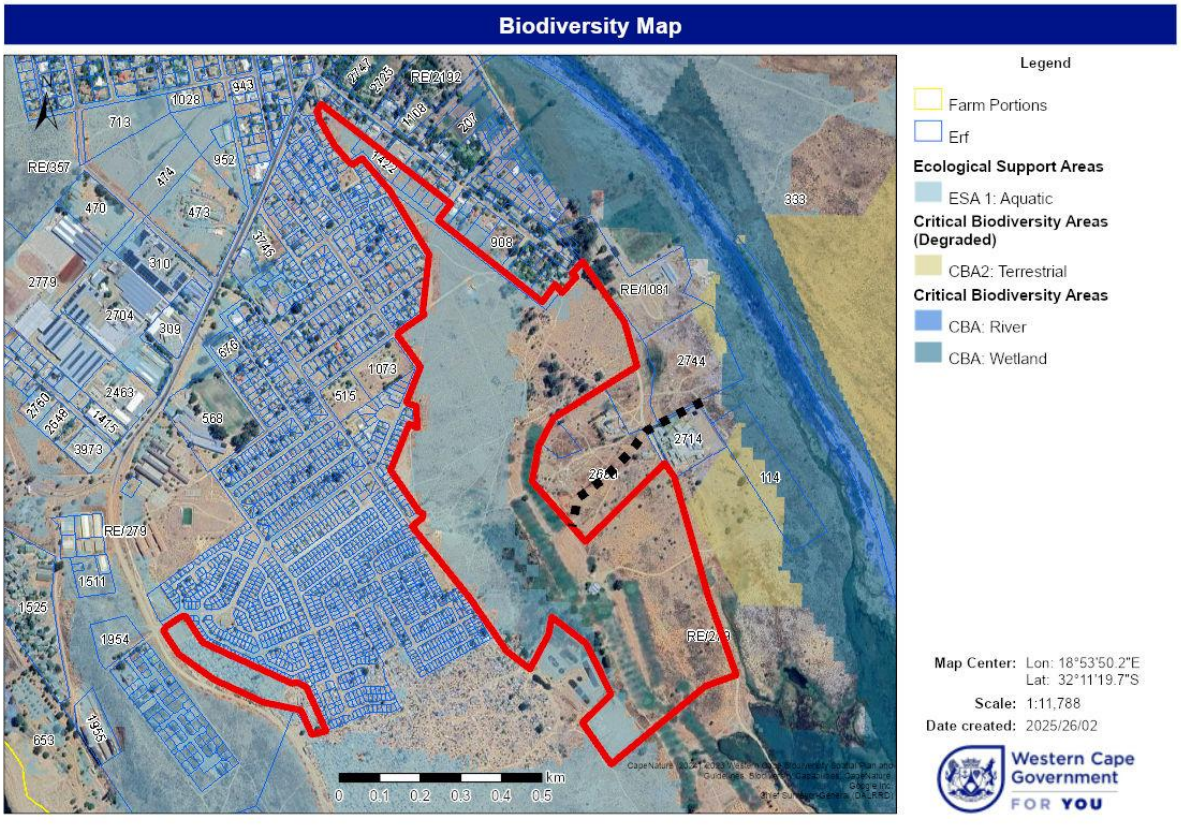


Figure 1: Biodiversity Map

Will the proposed development and its alternatives have an impact on terrestrial vegetation, or aquatic ecosystems (wetlands, estuaries or the coastline)? If yes, please explain:	YES	~~NO~~
Surface Water Features The proposed development sites are located on the east of the Olifants River and west		

of the Jan Dissels River within the E10J quaternary catchment area. A non-perennial stream originally flowed from east to west into the Jan Dissels River. The valley bottom wetland mapped must be protected by a 15m wide buffer. In order to achieve this, the layout was amended and the sewerage pipeline and pump station associated with an access road removed from the Site Development Plan in order to protect it. This will ensure that the development is appropriate and will not affect the status of the aquatic biodiversity features identified on site as a result of existing disturbances to the non-perennial river. Rehabilitation of the wetland by attending to alien invasive plant clearing and removal of litter and building rubble inside the wetland and creating of buffer around wetland of at least 15m, except for the GAP housing portion on the north and northeast of the wetland will protect the one wetland mapped. Creating stormwater detention after culvert before stormwater is released into the existing drainage line and valley bottom wetland releasing stormwater on site into the Jan Dissels River will protect the downstream valley bottom wetland. Rehabilitation of the existing stormwater pond by reshaping it and removal of alien invasive plants in the upper section of the valley bottom wetland and drainage line where into the discharged stormwater from the bigger wetland will be discharged before detained in on site stormwater pond on specially created open space erf in the development footprint will protect the valley bottom wetland and stormwater discharged into the Jan Dissels river.

No Freshwater Ecosystem Priority Area (FEPA) was mapped which confirmed the low impact.

Figure 2: Freshwater Ecological Features on site or in close proximity.

The ESA mapped on the original water course was however incorrectly mapped as a result of the impacts on the water course as described above.

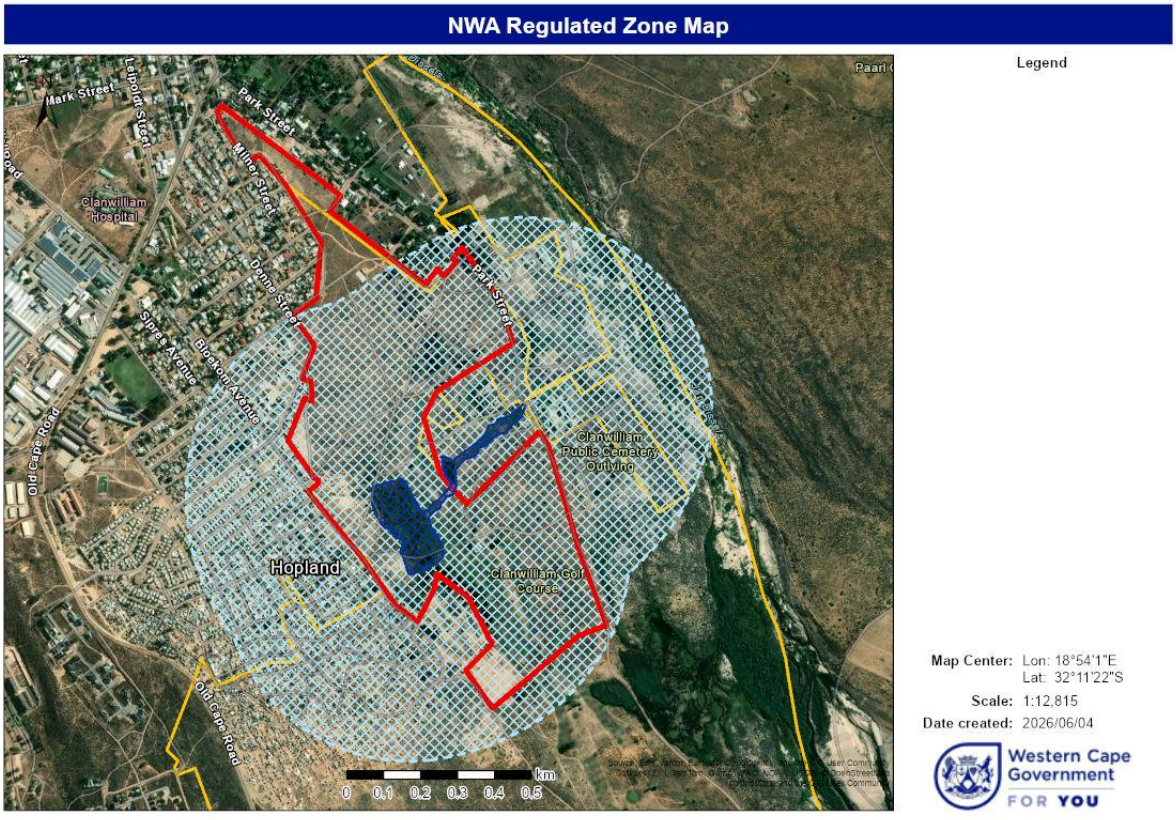


Figure 3: Surface water features and their regulated buffer zones.

Aquatic Biodiversity Impact Assessment Addendum_Clanwilliam Housing and WWTW V1.0

Van Zyl, K. and Morton, R. 2026. Aquatic Biodiversity Impact Assessment Addendum: Stormwater Management and WWTW Expansion, Clanwilliam Housing Development, Remainder Erf 279, Clanwilliam V1.0. Delta Ecology. RSA.

The receiving watercourses are the valley-bottom wetland system within the study area (Wetlands 1 and 2), the southern historical non-perennial drainage line which now consists of a reed-dominated seep wetland, and the Jan Dissels River. The Jan Dissels River flows into the Olifants River about 2.8 km downstream of the northern end of the study area and about 4.7 km downstream of the WWTW effluent release, measured along the river. A precautionary approach has therefore been adopted and the Olifants River has also been included in the assessment.

Wetlands 1 and 2, as referred to in previous assessments, form part of the same central valley-bottom wetland system and are therefore collectively referred to as the central valley-bottom wetland system in this addendum.

EnviroSwift (2025) classified the on-site wetland system as a natural unchannelled valley-bottom wetland, hydrologically connected to the Jan Dissels River and its

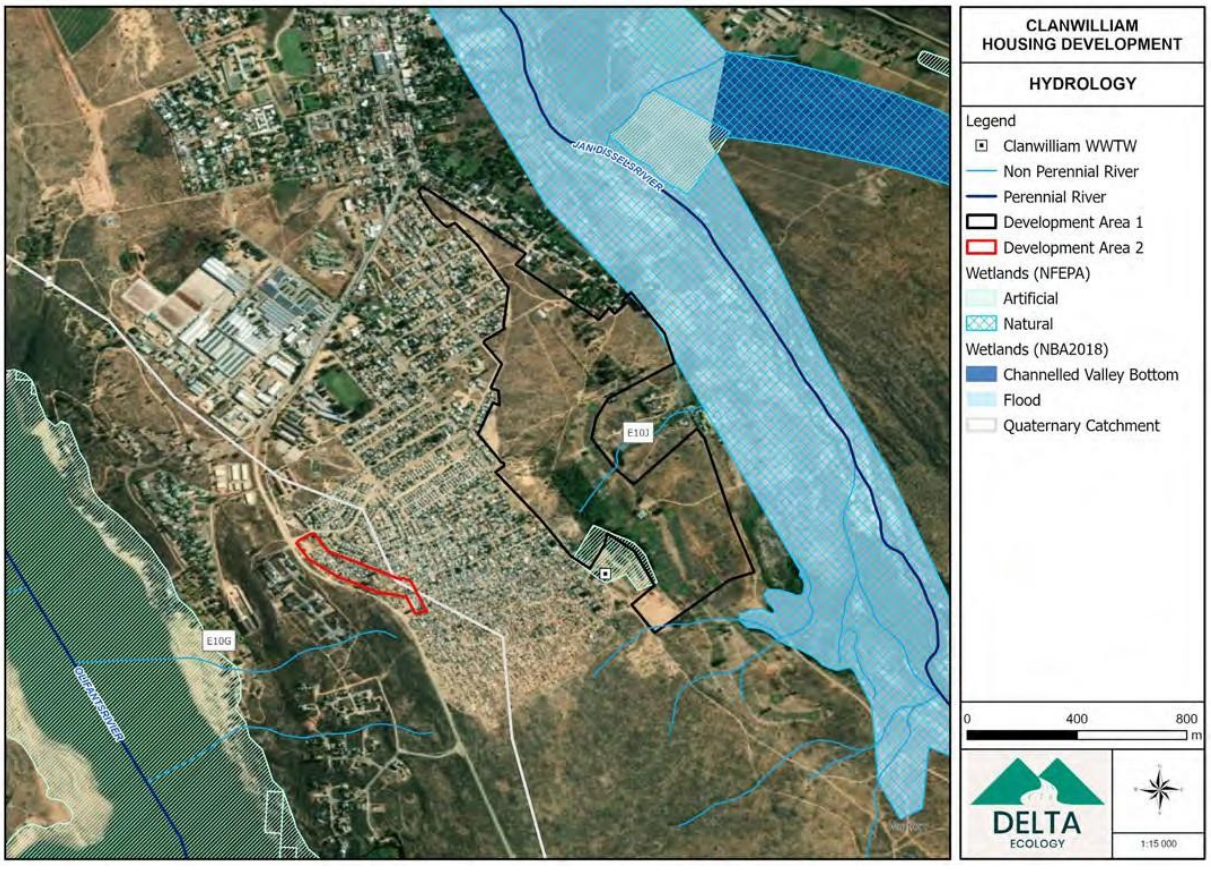
associated floodplain wetland. Historical mapping (see Section 4.1.2) indicates that the valley-bottom wetland occurs along a former non- perennial drainage system. The present wetland has developed along this historic drainage pathway and has been influenced by excavation, stormwater inputs from the town and the obstruction of drainage by the golf course (Enviro-EAP, 2026). For the purposes of this addendum, this feature is therefore treated as a valley-bottom wetland associated with a historic non-perennial drainage line.

A separate historic non-perennial drainage line also occurs to the south of the study area and now consist of treated effluent seepage dominated by Common Reed (Phragmites australis). For the purposes of this addendum, this feature is therefore referred to as the southern seep wetland.

The site lies in quaternary catchment E10H of the Olifants River system (Figure 4-1). The National Geographical Information Service (NGI) river dataset indicates the historic non-perennial drainage lines within and to the south of the study area, while the Jan Dissels River occurs to the east (NGI, 2019). The Jan Dissels River is a perennial river that flows through the Boskloof Valley before joining the Olifants River below Clanwilliam Dam, about 2.8 km downstream of the northern end of the study area and about 4.7 km downstream of the WWTW effluent release, measured along the river (OpenStreetMap contributors, 2026). The Jan Dissels River is classified as PES Category D (Largely Modified) (Van Deventer et al., 2019), with a Very High Ecological Importance (EI) and Very High Ecological Sensitivity (ES) (DWS, 2014). The Olifants River downstream of its confluence with the Jan Dissels River is similarly classified as PES Category D, with a Moderate EI, and a Very High ES.

The NFEPA (CSIR, 2011) spatial dataset for wetland vegetation types, where present, indicates that the study area corresponds with the Northwest Sand Fynbos, which is listed as Critically Endangered (CR) with protection level of Zero Protection (ZP).

The Jan Dissels River corridor is mapped as a CBA 1 and much of the site as an ESA 1 in the Western Cape Biodiversity Spatial Plan (CapeNature, 2023) (Figure 4-2). The site does not fall within a Strategic Water Source Area.



Flora

The National Vegetation Map of South Africa (2018) identifies the natural vegetation occurring within the area as Citrusdal Vygieveld, with a Least Threatened ecosystem status. The proposed construction and housing on west site and expansion of WWTW will however be on transformed areas impacted by existing WWTW infrastructure and squatters and not impact on any indigenous vegetation. The eastern housing site will impact on indigenous vegetation, but the impact will be of medium significance and no Species of Conservation Concern was recorded at the time of the site surveys. The following plant species were recorded during three site visits: *Albuca flaccida, Albuca maxima, Babiana ecklonii, Brunsvigia bosmaniae, Chlorophytum triflorum, Conicosia pugioniformis, Cotyledon orbiculate, Dimorphotheca pluvialis, Euphorbia tuberculate, Felicia merxmeulleri, Ferraria divaricate, Lapeirousia jacquinii, Lyperia tristis, Manulea altissima, Massonia depressa, Osteospermum clandestinum, Oxalis ambigua, Galenia Africana, Oxalis pes-caprae, Trachyandra muricata, Satyrium sp, Roepera morgsana*. The following species was listed in the environmental screen tool report as being present on the site: *Sceletium expansum, Drosanthemum pulchellum, Aspalathus wurmbeana, Ixia mollis, Pauridia maximiliani, Oxalis aurea, Oncosiphon intermedium, Walleria gracilis* and *Oxalis dines*, all with a medium sensitivity.

Fauna

This report is to assess the impact of the proposed Clanwilliam Housing Development

in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam with a total development footprint of ±49.6ha in the Western Cape on animal species. Two layout alternatives were assessed. Both layouts will result in the clearing of indigenous vegetation and therefore impact on animal species habitat. The development area consisting of Citrusdal Vygieveld vegetation on the edge and wedge in between the town, area impacted by squatter activities, golf course and wetlands which represents the animal species habitat on site. The bigger development area is ecologically connected to the south and east.

A desktop assessment was undertaken prior to the site visit to determine whether there are any Species of Conservation Concern and habitat features within the site that are considered sensitive. This was followed by field surveys on 6 October 2019 and 28 July 2023 which also informed the findings in this report. These surveys were focus on identified habitats that may host SCC. No SCC were recorded during the survey, but the area and habitat was identified to host black harriers. The Site Ecological Importance for the black harriers was assessed to be high. Breeding habitat was not identified and recorded on the site and exists to the east. They may therefore use the area to roam, but due to the vast habitat to the south and east and away from residential activities, they will not be impacted or affected.

The Department of Environmental Affairs screening report from the national web based environmental screening tool reported a “high and medium sensitivity (mostly medium with small area mapped high in southern edge) for animal species. The site sensitivity verification and specialist assessment does not differ from the designation of “medium” animal species as identified in the national web based environmental screening tool. The development of the site would have a **medium Negative** impact on animal species.

Potential negative impacts that may arise from the proposed development is:

- Disturbance
- Injury/mortality of species
- Human/animal conflict

Mitigation measures, both best practise and essential, include the following:

- Should any faunal SCC be encountered during construction and operation, these must be recorded (i.e. be photographed, GPS co-ordinates taken) and photographs placed on iNaturalist
- Any faunal species that may die as a result of construction activities must be recorded (i.e. be photographed, GPS co-ordinates taken) and these records placed on iNaturalist.
- In addition to all mitigations listed above a clause must be included in contracts for ALL personnel working on site stating that: “no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass.” A clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC.

Based on the impacts assessed in this report, it is recommended that the proposed development proceed with the implementation of strict environmentally responsible practices as outlined in the recommended mitigation measures.		
Will the proposed development and its alternatives have an impact on the loss of any populations of threatened plant or animal species, and/or on any habitat that may contain a unique signature of plant or animal species? If yes, please explain:	~~YES~~	NO

5.3 SOCIAL AND ECONOMIC ASPECTS

Current state of Cederberg Municipality Socio- Economic profile (2021)

Population
Cederberg's population totals 59737 persons in 2021, making it the least populated municipal area in the West Coast District (WCD). This total is expected to grow to 61702 by 2024, equating to an average annual growth rate of1.2 percent.

Sex ratio
The overall sex ratio (SR) depicts the number of males per 100 females in the population. The data indicates that there are slightly more females than males in the Cederberg municipal area with a ratio of 99.5 males per 100 females in 2021, rising to 101.6 males per 100 females in 2025. The increasing SR for could be attributed to a wide range of factors such as an increase in female mortality rates as well as the potential inflow of working males to the municipal area.

Age cohorts
Between 2020 and 2025, the highest population growth is estimated for the working age cohort, with expected growth for the period reaching an average annual rate of 1.2 percent. Similar growth of 1.1 percent is expected for the children under 14 years population.
Household size
Household size refers to the number of people per household. In the Cederberg area, no change in house hold size is expected. The actual size of households is estimated to remain at 3.7 persons per household over the 2024 to 2025 period.

Population density
Amidst rapid urbanisation across the Western Cape, population density figures will aid public sector decision makers to mitigate environmental, health and service delivery risks. In 2021, the population density of the West Coast District was 15 persons per square kilometre. In order of highest to lowest, the various local municipal areas in the West Coast District compare as follows:
Saldanha Bay - 61people/km^2
Swartland – 37 people/km^2
Bergrivier – 17 people/km^2
Cederberg – 7 people/km^2
Matzikama – 6 people/km^2

Learner enrolment, the learner-teacher ratio and learner retention rate
Learner enrolment in the Cederberg municipal area increased from 7889 in 2019 to 8019 in 2020. The same period also saw a marginal increase in the learner-teacher ratio from 29.5 to 30.2 learners per teacher.

With an average learner retention rate of 69.4 for the West Coast area, learner retention is a challenge across the district. Although the Cederberg area has one of the lowest (64.0) retention rates in the district, school dropouts remain a grave concern. The learner retention rate is influenced by a wide array of factors, including economic influences such as unemployment, poverty/very low household income, as well as social concerns such as teenage pregnancies. Retention rates should be kept in mind when considering education outcomes/results, also retention rates are likely to skew outcomes, as drop-outs are automatically excluded from any outcomes/results. Being able to retain learners is essential for overall positive education outcomes.

Number of schools
In 2020, the Cederberg municipal area had a total of 23 public ordinary schools.

Number of no-fee schools
The number of no-fee schools within the Cederberg area remain unchanged at 18 between 2019 and 2020. This could negatively impact upon the learner-teacher ratio and education outcomes, given the gradual increase in learner-enrolment.

Schools with libraries/media centres

As mentioned previously, there were 23 schools in the Cederberg municipal area in 2020. At only 8 of the 23 (34.7 percent) schools in the Cederberg area with such facilities, there is considerable scope for the extension of such facilities to the schools in the area.

Education outcomes (matric pass rate)
Education remains one of the key avenues through which the state is involved in the economy. In preparing individuals for future engagements in the labour market, policy decisions and choices in the sphere of education play a critical role in determining the extent to which future economic and poverty reduction plans may be realised.

Cederberg's matric outcomes dropped from 87.5 percent in 2019 to 82.8 percent in 2020. Better results could improve access to learners to higher education to broaden their employment opportunities.

Healthcare facilities
According to the 2019 Inequality Trend report by Statistics South Africa, in 2017, 75.1 percent of households in South Africa usually use public healthcare facilities when a household member gets ill, compared to 24.9 percent who use private healthcare facilities. This is associated with the low proportion of households with access to medical aid, which in 2017 was approximately 17 percent for South Africa and 25 percent for the Western Cape.

In 2020/21, the Cederberg municipal area had 6 primary healthcare facilities, which

comprised of 6 fixed clinics; there were also 5 mobile/satellite clinics.In addition to these primary healthcare facilities, there are 2 district hospitals.

HIV/AIDS
Cederberg's total registered patients receiving anti-retroviral treatment increased significantly between 2019/20 and 2020/21(increase of 103 patients) from 2651 patients in 2019 to 2774 patients in 2020. The 2774 patients receiving anti-retroviral treatment are treated at 5 clinics or treatment sites. The number of patients also increased across the district across the same reference period. The number of new anti-retroviral patients decreased from 404 in 2019/20 to 249 in2020/21. This figure also decreased across the district.

Child health
Immunisation rates in the Cederberg area is at 105.3 percent in 2020/21, having increased from 94.1 percent in 2019/20. The rate also increased slightly across the district, from 61.5 in 2019/20 to 69.0 in 2020/21.

The malnutrition rate for children under five years (per 100000) in the Cederberg municipal area decreased from 2.7 in 2019/20 to 2.1 in 2020/21. The rate also edged downwards in the district from 1.7 in 2019/20 to 1.0 in 2020/21.

Maternal health
The maternal mortality rate in the Cederberg municipal area remained at zero death per 100 000 in 2020/21, while the West Coast District maternal mortality rate has increased substantially from zero death per 100 000 in 2019/20 to 43.0 death per 100 000 in 2020/21. The delivery rate to women under 20 years in Cederberg area and West Coast District was recorded at 15.5 and 14.7 percent respectively while the termination of pregnancy rate remained constant at 0.5 percent in the municipal area between 2019/20 and 2020/21. The district rate increase diverse slightly from 0.4 to 0.5 across thes ame period.

Emergency medical services
The provision of more operational ambulances can provide greater coverage of emergency medical services. The Cederberg area has 1 ambulances per 10 000 people in 2020/21, below that of the District's average of 2. It is worth noting that this number only refers to Provincial ambulances and excludes all private service providers.
A review of the COVID-19 related health information for the District has been included in the Municipal Economic Review and Outlook of 2021. This includes an analysis of the number of recorded cases, hospital admissions and recorded deaths for the period March 2020 to October 2021.

GDPR per capita
An increase in regional gross domestic product (GDPR) per capita, i.e. GDPR per person, is experienced only if the real economic growth rate exceeds the population growth rate. Even though real GDPR per capita reflects changes in the overall well-being of the population, not everyone within an economy will earn the same amount of money as estimated by the real GDPR per capita indicator. At R 66 541 in 2020 Cederberg's nominal GDPR per capita is below the West Coast District figure of R69 251 while also

ranking second bottom when compared to that of neighbouring municipalities (WCD). Furthermore, Cederberg's per capita income ranks well below that of the Western Cape Figure of R 84 967.

Income inequality
The National Development Plan (NDP) has set a target of reducing income inequality in South Africa from a Gini coefficient of 0.7 in 2010 to 0.6 by 2030. However, between 2014 and 2020, income inequality has worsened in Cederberg area, with the gini-coefficient increasing from 0.58 in 2014 to 0.61 in 2020.

Worsening income inequality could also be seen across the West Coast District (0.57 in 2014 and 0.61 in 2020) as well as the Western Cape Province (0.60 in 2014 and 0.62 in 2020.

Human development
The HDI (Human Development Index) is a composite indicator reflecting on education levels, health, and income. It is a measure of peoples' ability to live a long and healthy life, to communicate, participate in the community and to have sufficient means to be able to afford a decent living. The HDI is represented by a number between 0 and 1, where 1 indicates a high level of human development and 0 represents no human development. The United Nations uses the Human Development Index (HDI) to assess the relative level of socio-economic development within countries.
There has been a general increase in the HDI for the Cederberg area, from 0.66 in 2017 to 0.71 in 2020. There has been a similar upward trend for the West Coast District as well as for the Western Cape.

The Constitution stipulates that every citizen has the right to access to adequate housing and that the state must take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Access to housing also includes access to services such as potable water, basic sanitation, safe energy sources and refuse removal services, to ensure that house holds enjoy a decent standard of living.

This section considers to what extent this has been achieved by reflecting on the latest available information from Quantec Research for 2019. The latest official statistics was collected by Statistics South Africa for the 2016 Community Survey; the 2021 Census will provide the updated official statistics. The information on free basic services for 2018 is obtained from Statistics South Africa's 2019 Non-Financial Census of Municipalities survey findings.

Housing and household services
With a total of 16721 households in the Cederberg municipal area, 85.9 percent had access to formal housing, the second highest when compared with other municipalities in the West Coast District area; the West Coast District average was 86.4percent. This is counter balanced against the 6.0 per informal dwellings in the Cederberg area, compared with the district average of 6.9 percent.

With the exception of refuse removal and chemical toilets, service access levels in the Cederberg municipal area were at the same or better levels than access to formal

dwellings, with access to piped water inside/within 200 m of the dwelling at 97.5 percent, access to electricity (for lighting) at 88.1percent. Access levels in the municipal area were below the district averages.

Free basic services

Municipalities also provide a package of free basic services to households who are financially vulnerable and struggle to pay for services. The number of households receiving free basic services in the Cederberg municipal area has shown an overall declining trend between 2016 and 2019. The stressed economic conditions are anticipated to exert pressure on household income levels, which is in turn likely to see the number of indigent households and the demand for free basic services increase.

Formal and Informal Employment

It is estimated that Cederberg's total employed will in 2020 amount to 25 308 workers of which 19 244 (76.0 percent) are in the formal sector while 6064 (23.9 percent) are informally employed. Most of the formally employed consisted of low-skilled (52.1 percent) and semi-skilled (35.5 percent) workers. Although the skilled category only contributed 12.4 percent to total formal employment (2020), it outpaced the other two categories in terms of average annual growth–between 2016 and 2020, the skilled cohort grew on average by 0.8 percent (albeit off a small base) while the semi-skilled and low-skilled categories grew at 0.6 and-0.8 percent respectively. The growth in the skilled category reflects the market demand for more skilled labour. Evidently, the demand for skilled labour is on the rise which implies the need to capacitate and empower low-skilled and semi-skilled workers.

Unemployment

Cederberg's unemployment rate of 7.8 percent in 2020 was below that of the West Coast District (11.7 percent) and considerably lower than that the Western Cape's unemployment rate of 18.9 percent. The unemployment rates are concerning given that this estimate is based on the narrow definition of unemployment i.e. the percentage of people that are actively looking for work, but unable to find employment. In turn, the broad definition refers to people that want to work but are not actively seeking employment (excludes those who have given up looking for work).

Spending on social infrastructure

Spending on social infrastructure aids in social development and has the spill-over effect to enabling economic growth. The Western Cape Government (WCG) will spend 100 percent of its 2021/22 infrastructure budget for the Cederberg municipal area on social infrastructure. WCG will be allocating 87.8 percent of the budget (R19.500 million) towards Human Settlement in the Cederberg municipal area. Spending on human settlement is crucial as this will address the backlogs in housing in the Cederberg municipal area. In addition to Provincial spend, the Municipality has allocated 4.5 percent (R1.528 million) of its own 2021/22 capital spending to human settlement. Spending on education is crucial as it can serve to improve education outcomes and skills levels within a community, and more importantly alleviate poverty through increased long-term income for individuals. WCG will be allocating 9.0 percent of the budget (R2.000 million) towards Education in the Cederberg municipal area. The Municipality will complement this spending by allocating R1.775 million towards sport and recreation. A healthy and resilient community increases

productivity and reduces pressures on government resources. As such 3.2 percent (R710 000) has been allocated by the Department of Health for health infrastructure spending in the Cederberg area.

Spending on economic infrastructure
Economic infrastructure is defined as infrastructure that promotes economic activity. Considering the sluggish economic growth throughout the country, spending on economic infrastructure is crucial to stimulating economic activity. The municipality allocated R4.044 million (9.5 percent in 2021/22) towards economic infrastructure, more specifically towards the resealing of roads. Road transport infrastructure goes a long way towards unlocking the region's economic potential. Infrastructure investment, especially road infrastructure will not only improve livelihoods and quality of life but plays an essential part in enhancing economic growth by creating jobs and by improving the competiveness of the private business environment.

Spending on trading services
Basic services are crucial to improving the living conditions of citizens within the municipal area and enabling economic activity for businesses via access to water, electricity, sanitation and refuse removal. The majority of the Municipality's infrastructure budget i.e.75.9 percent or R33.8 million in 2021/22 is allocated towards the provision of basic services. The majority of spending on trading services has been allocated towards energy sources (R20.667 million). This was followed by wastewater management (R8.025 million), water management (R6.323 million) and waste management (R2.303 million).

The budget for the WWTW upgrade is R 54,300,000-00

Job creation and opportunity
Local labour will be employed for all labour-intensive tasks in terms of EPWP guidelines although this is not an EPWP project;
All locally employed labour will be selected in consultation with the local municipality ward councillors, community leaders and the Community Liaison Officer;
Formal contracts of employment will be entered into for each local labourer employed;
A Community Liaison Officer will be employed to facilitate employment of local labour and the facilitation of labour issues.
In addition to the above, skills training will be undertaken to empower the incumbents with new skills such as carpentry for shutter erection, pipe laying and brick masonry work. Softer skills such as basic office administration and low-level accounting will also be incorporated to accommodate female employees.

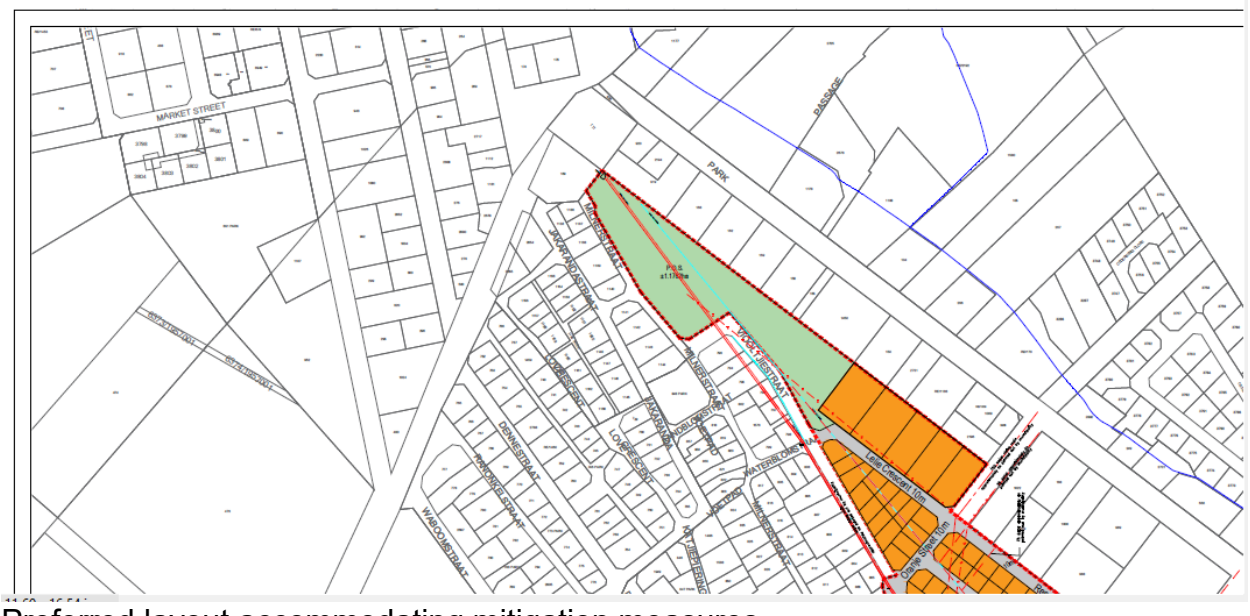
What is the expected capital value of the project on completion?	Unknown	
What is the expected yearly income or contribution to the economy that will be generated by or as a result of the project?	Unknown	
Will the project contribute to service infrastructure?	YES	~~NO~~
Is the project a public amenity?	YES	~~NO~~
How many new employment opportunities will be created during the development phase?	Unkown	
What is the expected value of the employment opportunities during the development phase?	Unknown	

What percentage of this will accrue to previously disadvantaged individuals?	As much as possible/very large percentage
The main purpose of this Environmental Authorization and Water Use License application is to develop housing and stands to meet the requirement of Clanwilliam. The WWTW also needed to be upgrade and expanded to improve current treatment as well as to provide for capacity to service the expansion and increase in services needs as result of the housing development.	
How many permanent new employment opportunities will be created during the operational phase of the project?	Unknown.
What is the expected current value of the employment opportunities during the first 10 years?	Unknown
What percentage of this will accrue to previously disadvantaged individuals?	Unknown
How will this be ensured and monitored (please explain): As above	
Any other information related to the manner in which the socio-economic aspects will be impacted:	
None at this stage.	

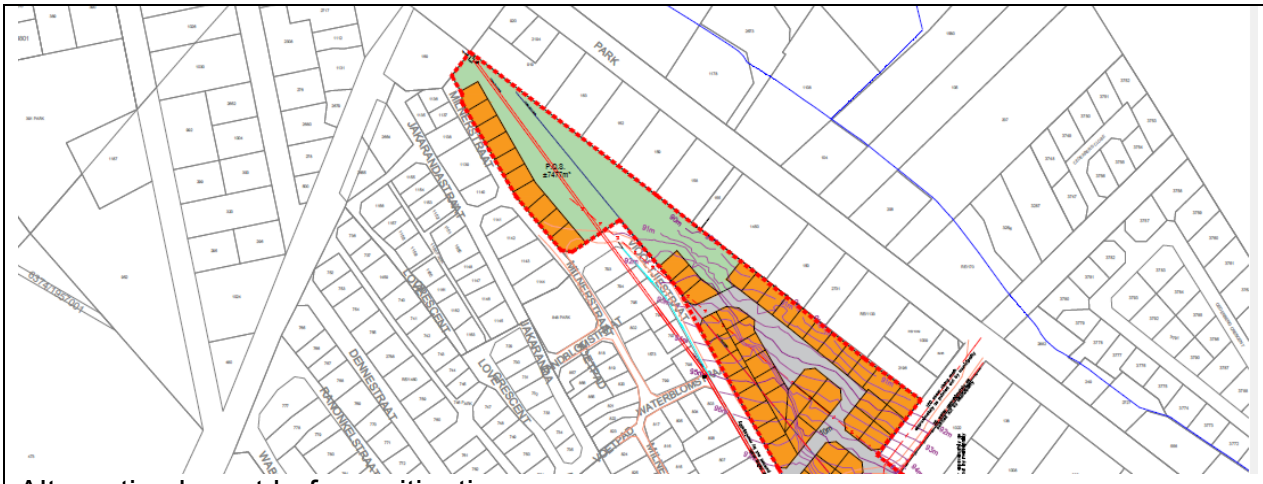
5.4 HERITAGE AND CULTURAL ASPECTS

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order to retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space. This would require the reallocation of approximately 50 GAP housing erven.

This was mitigated in the preferred layout. See screen shots below of the area



Preferred layout accommodating mitigation measures



Alternative layout before mitigation

- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Due to the position of the proposed development between two areas that have been identified as having heritage value, additional design detail be submitted to HWC for approval as a condition of a positive comment on this HIA. The architecture of the proposed development should adhere to the Guidelines included as Appendix 3.
- The attached Chance Fossil Finds Procedure is implemented for the duration of construction activities
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.

SECTION 6: IMPACT ASSESSMENT

This impact assessment aims to assess the balance between conservation and respect for the natural environmental attributes of the general area and the socio-economic need for sustainable employment opportunities and capital. The outcome of the assessment will be used to determine the viability of the project.

Based on the EAP's assessment, issues raised by I&AP's and the project team, specialist studies were undertaken to provide baseline information to address the concerns and assess the impacts of the proposed development on the environment. The specialists are provided with set criteria for undertaking their assessments, to allow for comparative assessment of all issues, based on the requirements of the EIA Regulations.

The information from the specialist studies has been used by the planning team to inform the current development proposals. The preferred alternative (as indicated in Section 3) were discussed with the applicant and finalised accordingly.

6.1 ASSESSMENT METHODOLOGY

Below is the assessment methodology utilized in determining the significance of the

construction, operational and decommission impacts of the proposed activities, and where applicable the possible alternatives, on the biophysical and socio-economic environment. The methodology is broadly consistent to that described in DEA&DP's Guideline Document on the EIA Regulations (1998).

For each impact, the significance is determined by various factors. Significance is described prior to mitigation as well as with the most effective mitigation measure(s) in place. The mitigation described in the document (also see Appendix F for the Draft Environmental Management Programme) represents the full range of plausible and pragmatic measures *but does not necessarily imply that they all should or will be implemented*. The decision as to which mitigation measures to implement lies with the applicant and ultimately with the DEA&DP.

To facilitate informed decision-making, EIAs must endeavour to come to terms with the significance of the potential environmental impacts associated with particular development activities. Despite the attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, EIA processes can never completely escape the subjectivity inherent in attempting to define significance. Recognising this, potential subjectivity in the current process is addressed as follows:

- Be clear about the difficulty of being completely objective in the determination of significance;
- Develop an explicit methodology for assigning significance to impacts and outlining this methodology in detail. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing toward determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the EIR with a clear summary of how the assessor derived the assigned significance; and
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties.

Although these measures may not totally eliminate subjectivity, they do provide an explicit context within which to review the assessment of impacts.

Table 6: Assessment criteria for the evaluation of impacts

Criteria	**Description**		
Nature	a description of what causes the effect, what will be affected, and how it will be affected.		
	Type	**Score**	**Description**
Extent (E)	None (No)	1	Footprint
	Site (S)	2	On site or within 100 m of the site
	Local (L)	3	Within a 20 km radius of the centre of the site
	Regional (R)	4	Beyond a 20 km radius of the site
	National (Na)	5	Crossing provincial boundaries or on a national / land wide scale
Duration (D)	Short term (S)	1	0 – 1 years
	Short to medium (S-M)	2	2 – 5 years
	Medium term (M)	3	5 – 15 years
	Long term (L)	4	> 15 years
	Permanent(P)	5	Will not cease

Criteria	Description		
Magnitude (M)	Small (S)	0	will have no effect on the environment
	Minor (Mi)	2	will not result in an impact on processes
	Low (L)	4	will cause a slight impact on processes
	Moderate (Mo)	6	processes continuing but in a modified way
	High (H)	8	processes are altered to the extent that they temporarily cease
	Very high (VH)	10	results in complete destruction of patterns and permanent cessation of processes.
Probability (P) the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned	Very improbable (VP)	1	probably will not happen
	Improbable (I)	2	some possibility, but low likelihood
	Probable (P)	3	distinct possibility
	Highly probable (HP)	4	most likely
	Definite (D)	5	impact will occur regardless of any prevention measures
Significance (S)	Determined through a synthesis of the characteristics described above: **S = (E+D+M) x P** Significance can be assessed as low, medium or high		
Low: < 30 points:	The impact would not have a direct influence on the decision to develop in the area		
Medium: 30 – 60 points:	The impact could influence the decision to develop in the area unless it is effectively mitigated		
High: < 60 points:	The impact must have an influence on the decision process to develop in the area		
No significance	When no impact will occur or the impact will not affect the environment		
Status	Positive (+)		Negative (-)
The degree to which the impact can be reversed	Completely reversible (R)	90-100%	The impact can be mostly to completely reversed with the implementation of the correct mitigation and rehabilitation measures.
	Partly reversible (PR)	6-89%	The impact can be partly reversed providing that mitigation measures as stipulated in the EMP are implemented and rehabilitation measures are undertaken
	Irreversible (IR)	0-5%	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures taking place
The degree to which the impact may cause irreplaceable loss of resources	Resource will not be lost (R)	1	The resource will not be lost or destroyed provided that mitigation and rehabilitation measures as stipulated in the EMP are implemented
	Resource may be partly destroyed (PR)	2	Partial loss or destruction of the resources will occur even though all management and mitigation measures as stipulated in the EMP are implemented
	Resource cannot be replaced (IR)	3	The resource cannot be replaced no matter which management or mitigation measures are implemented.
The degree to which the impact can be mitigated	Completely mitigatible (CM)	1	The impact can be completely mitigated providing that all management and mitigation measures as stipulated in the EMP are implemented
	Partly mitigatible (PM)	2	The impact cannot be completely mitigated even though all management and mitigation measures as stipulated in the EMP are implemented. Implementation of these

Criteria	Description		
			measures will provide a measure of mitigatibility
	Un-mitigatible (UM)	3	The impact cannot be mitigated no matter which management or mitigation measures are implemented.

6.2 IMPACT ASSESSMENT

Below is a description of the potential impacts of the project on the geographical, physical, biological, social, economic, heritage and cultural aspects environment. Each aspect is discussed in terms of the construction, operational and decommissioning phases. It is not anticipated that the planning and design phase will have any impacts on the environment and as such, this phase is not discussed below. As mentioned, the post operational activities have not yet been fully determined. Detailed decommissioning impacts will be determined closer to the end of life of the project under the relevant regulations of the day. The alternatives considered, as part of the impact assessment is the layout alternatives and the No-Go/No-development Alternative.

(A) IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS

SOIL EROSION AND DUST

Preferred Alternative:	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Soil erosion and dust**
Nature of impact:	**Soil erosion can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should rains fall during construction. Due to the sloping nature of the terrain, it is unlikely that a shallow perched water table will develop on site.**
Extent and duration of impact:	**Extent 1 & Duration 5 (permanent)**
Consequence of impact or risk:	**Clearing and excavation activities can result in erosion and dust.**
Magnitude	**2**
Probability of occurrence:	**2 (Improbable: some possibility, but low likelihood)**
Degree to which the impact may cause irreplaceable loss of resources:	**2-Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**Completely reversible (R)**
Indirect impacts:	**Disturbance to surface area can result in erosion and dust generation**
Cumulative impact prior to mitigation:	**Exposing soil may lead to erosion and dust generation if not mitigated.**
Significance rating of impact prior to	**16 - Low**

mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1-Completely mitigatable (CM)**
Proposed mitigation:	• **Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate construction areas only.** • **Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately.** • **Undertake dust suppression as needed.** • **Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion.** • **Undertake storm water management measures as required.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**8 - Low**
OPERATIONAL PHASE	
Potential impact and risk:	**Not applicable to operational phase.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

Alternative:	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Soil erosion and dust**
Nature of impact:	**Soil erosion can occur due to wind (wind erosion cause dust pollution); and due to**

	overland storm water flow should rains fall during construction. Due to the sloping nature of the terrain, it is unlikely that a shallow perched water table will develop on site.
Extent and duration of impact:	**Extent 1 & Duration 5 (permanent)**
Consequence of impact or risk:	**Clearing and excavation activities can result in erosion and dust.**
Magnitude	**2**
Probability of occurrence:	**2 (Improbable: some possibility, but low likelihood)**
Degree to which the impact may cause irreplaceable loss of resources:	**2-Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**Completely reversible (R)**
Indirect impacts:	**Disturbance to surface area can result in erosion and dust generation**
Cumulative impact prior to mitigation:	**Exposing soil may lead to erosion and dust generation if not mitigated.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**16 - Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1-Completely mitigatable (CM)**
Proposed mitigation:	• **Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate construction areas only.** • **Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately.** • **Undertake dust suppression as needed.** • **Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion.** • **Undertake storm water management measures as required.**

Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**8 - Low**
OPERATIONAL PHASE	
Potential impact and risk:	**Not applicable to operational phase.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

WATER POLLUTION

Preferred Alternative:	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Impact of construction activities on surface and underground water pollution.**
Nature of impact:	**Construction could result in the pollution of surface water and eventually result in ground water pollution. Storm water contamination will result in surface water pollution. Construction activities such as excavation and clearing of vegetation and or diesel and oil spills could impact surface and ground water quality.**
Extent and duration of impact:	**Extent 3 (Within a 20 km radius of the centre of the site) & Duration 2 (2-5 years)**
Consequence of impact or risk:	**Possible pollution of surface and ground water.**
Magnitude	**6**
Probability of occurrence:	**4 (most likely)**
Degree to which the impact may cause irreplaceable loss of resources:	**Partly destroyed 2 (PR)**
Degree to which the impact can be reversed:	**Partly reversible 6-89% (PR)**
Indirect impacts:	**Pollution of water resources.**
Cumulative impact prior to mitigation:	**Diesel and oil spills affecting ground and surface water quality.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High,	**44 - Medium**

High, or Very-High)	
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**2-Partly mitigatable (PM)**
Proposed mitigation:	**Mitigation measures included in EMP, attached as Appendix H, shall be adhered to.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**Diesel and oil spills affecting ground and surface water quality.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**27 – Low**
OPERATIONAL PHASE. Not applicable	
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

Alternative:	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Impact of construction activities on surface and underground water pollution.**
Nature of impact:	**Construction could result in the pollution of surface water and eventually result in ground water pollution. Storm water contamination will result in surface water pollution. Construction activities such as excavation and clearing of vegetation and or diesel and oil spills could impact surface and ground water quality.**
Extent and duration of impact:	**Extent 3 (Within a 20 km radius of the centre of the site) & Duration 2 (2-5 years)**
Consequence of impact or risk:	**Possible pollution of surface and ground water.**
Magnitude	**6**
Probability of occurrence:	**4 (most likely)**
Degree to which the impact may cause irreplaceable loss of resources:	**Partly destroyed 2 (PR)**
Degree to which the impact can be reversed:	**Partly reversible 6-89% (PR)**

Indirect impacts:	**Pollution of water resources.**
Cumulative impact prior to mitigation:	**Diesel and oil spills affecting ground and surface water quality.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**44 - Medium**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**2-Partly mitigatable (PM)**
Proposed mitigation:	**Mitigation measures included in EMP, attached as Appendix H, shall be adhered to.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**Diesel and oil spills affecting ground and surface water quality.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**27 – Low**
OPERATIONAL PHASE. Not applicable	
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

DISTURBANCE TO SUBSURFACE GEOLOGICAL LAYERS

Preferred Alternative:	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Construction activities can affect the underlying geological layers on site to some extent.**
Nature of impact:	**Disturbance to subsurface geological layers.**
Extent and duration of impact:	**Extent 1 & Duration 2 (2-5 years)**
Consequence of impact or risk:	**Excavation activities can disturb subsurface geological layers.**
Magnitude	**2**
Probability of occurrence:	**2 (Improbable: some possibility, but low likelihood)**
Degree to which the impact may cause irreplaceable loss of	**2-Resource may be partly destroyed (PR)**

resources:	
Degree to which the impact can be reversed:	**0% (IR)**
Indirect impacts:	**Disturbance to surface area can result in erosion and dust generation**
Cumulative impact prior to mitigation:	**It is not anticipated that the impact will be high as the affected substrata is very shallow and the integrity of the underlying ground structures will thus not be sacrificed.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**10 – Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**2**
Proposed mitigation:	**Due to the nature of the impacts, not much can be done to mitigate the impact, only the severity of it can be managed. Mitigation and management for affecting geology is to ensure that removal of soil is kept to a minimum – removal of soil should only be in areas where infrastructure will be established.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**10 - Low**
OPERATIONAL PHASE	
Potential impact and risk:	**Not applicable to operational phase.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

Alternative:	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Construction activities can affect the**

	underlying geological layers on site to some extent.
Nature of impact:	**Disturbance to subsurface geological layers.**
Extent and duration of impact:	**Extent 1 & Duration 2 (2-5 years)**
Consequence of impact or risk:	**Excavation activities can disturb subsurface geological layers.**
Magnitude	**2**
Probability of occurrence:	**2 (Improbable: some possibility, but low likelihood)**
Degree to which the impact may cause irreplaceable loss of resources:	**2-Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**0% (IR)**
Indirect impacts:	**Disturbance to surface area can result in erosion and dust generation**
Cumulative impact prior to mitigation:	**It is not anticipated that the impact will be high as the affected substrata is very shallow and the integrity of the underlying ground structures will thus not be sacrificed.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**10 – Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**2**
Proposed mitigation:	**Due to the nature of the impacts, not much can be done to mitigate the impact, only the severity of it can be managed. Mitigation and management for affecting geology is to ensure that removal of soil is kept to a minimum – removal of soil should only be in areas where infrastructure will be established.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after	**10 - Low**

mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
OPERATIONAL PHASE	
Potential impact and risk:	**Not applicable to operational phase.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

WASTE IMPACTS

Preferred Alternative:	
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Waste Impacts**
Nature of impact:	**General construction waste will be generated during the construction phase. Poor waste management practices on site may lead to dumping and windblown litter creating a negative visual impact and nuisance for adjacent landowners / users as well as impacting the natural environment.**
Extent and duration of impact:	**Extent 2 (On site or within 100 m of the site) & Duration 2**
Consequence of impact or risk:	**Pollution and nuisance.**
Magnitude:	**4**
Probability of occurrence:	**3**
Degree to which the impact may cause irreplaceable loss of resources:	**1-Resource will not be lost (R)**
Degree to which the impact can be reversed:	**Reversible**
Indirect impacts:	**Impacts on ecological functioning of river. Impacts on fauna.**
Cumulative impact prior to mitigation:	**• Dumping;** **• Windblown litter causing nuisance;** **• Pollution / degradation of the natural environment.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**24 -Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be	**1**

mitigated:	
Proposed mitigation:	**All waste generated on site shall be collected and disposed of at a registered landfill facility;** **All safe disposal certificates and waste manifests from service providers to be kept and maintained;** **All staff to receive training on correct waste management practices.**
Residual impacts:	**None**
Cumulative impact post mitigation:	**None**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**18 – Low**
OPERATIONAL PHASE. Not applicable	
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

Alternative:	
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Waste Impacts**
Nature of impact:	**General construction waste will be generated during the construction phase. Poor waste management practices on site may lead to dumping and windblown litter creating a negative visual impact and nuisance for adjacent landowners / users as well as impacting the natural environment.**
Extent and duration of impact:	**Extent 2 (On site or within 100 m of the site) & Duration 2**
Consequence of impact or risk:	**Pollution and nuisance.**
Magnitude:	**4**
Probability of occurrence:	**3**
Degree to which the impact may cause irreplaceable loss of resources:	**1-Resource will not be lost (R)**
Degree to which the impact can be reversed:	**Reversible**
Indirect impacts:	**Impacts on ecological functioning of river. Impacts on fauna.**
Cumulative impact prior to mitigation:	**• Dumping;** **• Windblown litter causing nuisance;** **• Pollution / degradation of the natural environment.**

Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**24 -Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1**
Proposed mitigation:	**All waste generated on site shall be collected and disposed of at a registered landfill facility;** **All safe disposal certificates and waste manifests from service providers to be kept and maintained;** **All staff to receive training on correct waste management practices.**
Residual impacts:	**None**
Cumulative impact post mitigation:	**None**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**18 – Low**
OPERATIONAL PHASE. Not applicable	
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

NOISE

Preferred alternative	**Socio-Economic Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Impact of noise on surrounding environment, especially the surrounding residential area.**
Nature of impact:	**Environmental noise pollution. Nuisance impacts could relate to the increase noise and disturbance associated with the proposed development, e.g. noise, traffic etc.** **Construction activities and construction personnel on the sites, and construction vehicles moving to and from the sites would cause an increase in noise in the area, which may impact negatively upon the**

	adjoining landowners.
Extent and duration of impact:	**Extent 2 (On site or within 100 m of the site) & Duration 1 (0 – 1 years)**
Magnitude	**2**
Consequence of impact or risk:	**Nuisance**
Probability of occurrence:	**3 (distinct possibly)**
Degree to which the impact may cause irreplaceable loss of resources:	**1-Resource will not be lost (R)**
Degree to which the impact can be reversed:	**Completely reversible (R) - This will not be a long-term impact nor will it have an impact on the natural processes. It is thus 100% reversible.**
Indirect impacts:	**Nuisance**
Cumulative impact prior to mitigation:	**Nuisance**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**15 – Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1- Completely mitigatable (CM)**
Proposed mitigation:	• **Working hours will be restricted to normal working hours.** • **All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels.** • **All plant and machinery are to be fitted with adequate silencers.** • **No sound amplification equipment such as sirens, loud hailers or hooters may be used on site, after normal working hours, except in emergencies.** • **If work is to be undertaken outside of normal work hours, permission must be obtained from the Local Authority**
Residual impacts:	**Nuisance**
Cumulative impact post mitigation:	**Nuisance**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**15 - Low**

OPERATIONAL PHASE	
Potential impact and risk:	**Not applicable to operational phase.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

Alternative	**Socio-Economic Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Impact of noise on surrounding environment, especially the surrounding residential area.**
Nature of impact:	**Environmental noise pollution. Nuisance impacts could relate to the increase noise and disturbance associated with the proposed development, e.g. noise, traffic etc.** **Construction activities and construction personnel on the sites, and construction vehicles moving to and from the sites would cause an increase in noise in the area, which may impact negatively upon the adjoining landowners.**
Extent and duration of impact:	**Extent 2 (On site or within 100 m of the site) & Duration 1 (0 – 1 years)**
Magnitude	**2**
Consequence of impact or risk:	**Nuisance**
Probability of occurrence:	**3 (distinct possibly)**
Degree to which the impact may cause irreplaceable loss of resources:	**1-Resource will not be lost (R)**
Degree to which the impact can be reversed:	**Completely reversible (R) - This will not be a long-term impact nor will it have an impact on the natural processes. It is thus 100% reversible.**
Indirect impacts:	**Nuisance**
Cumulative impact prior to mitigation:	**Nuisance**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**15 – Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1- Completely mitigatable (CM)**

Proposed mitigation:	• **Working hours will be restricted to normal working hours.** • **All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels.** • **All plant and machinery are to be fitted with adequate silencers.** • **No sound amplification equipment such as sirens, loud hailers or hooters may be used on site, after normal working hours, except in emergencies.** • **If work is to be undertaken outside of normal work hours, permission must be obtained from the Local Authority**
Residual impacts:	**Nuisance**
Cumulative impact post mitigation:	**Nuisance**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**15 - Low**
OPERATIONAL PHASE	
Potential impact and risk:	**Not applicable to operational phase.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to impacts associated with construction phase.**

HEALTH AND NUISANCE IMPACT

Preferred Alternative:	**Socio-Economic Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**The surrounding land users/ owners will be exposed to the presence of the construction machinery**
Nature of impact:	**Nuisance and air quality impacts as a result of dust and exhaust fumes**
Extent and duration of impact:	**Extent 3 & Duration 2 (2-5 years)**
Consequence of impact or risk:	**The surrounding land users/ owners will be exposed to nuisance and air quality impacts as a result of dust and exhaust fumes**
Magnitude	**2**
Probability of occurrence:	**4 (most likely)**
Degree to which the impact may cause irreplaceable loss of resources:	**2 (PR)**
Degree to which the impact can be reversed:	**2 (PM)**

Indirect impacts:	
Cumulative impact prior to mitigation:	**Nuisance and air quality impacts as a result of dust and exhaust fumes**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**28 - Low**
Degree to which the impact can be avoided:	**Low**
Degree to which the impact can be managed:	**Low**
Degree to which the impact can be mitigated:	**Low**
Proposed mitigation:	• **Proposed construction activities must be limited to development footprint site.** • **Dust must be managed and control on site.** • **All construction vehicles must be serviced to prevent access exhaust emissions and noise.**
Residual impacts:	**Health impacts**
Cumulative impact post mitigation:	**The surrounding environment will not be affected by construction activities**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**24 – Low**
OPERATIONAL PHASE. Not applicable	
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to construction phase.**

Alternative:	**Socio-Economic Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**The surrounding land users/ owners will be exposed to the presence of the construction machinery**
Nature of impact:	**Nuisance and air quality impacts as a result of dust and exhaust fumes**
Extent and duration of impact:	**Extent 3 & Duration 2 (2-5 years)**
Consequence of impact or risk:	**The surrounding land users/ owners will be exposed to nuisance and air quality impacts as a result of dust and exhaust fumes**
Magnitude	**2**
Probability of occurrence:	**4 (most likely)**
Degree to which the impact may	**2 (PR)**

cause irreplaceable loss of resources:	
Degree to which the impact can be reversed:	**2 (PM)**
Indirect impacts:	
Cumulative impact prior to mitigation:	**Nuisance and air quality impacts as a result of dust and exhaust fumes**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**28 - Low**
Degree to which the impact can be avoided:	**Low**
Degree to which the impact can be managed:	**Low**
Degree to which the impact can be mitigated:	**Low**
Proposed mitigation:	• **Proposed construction activities must be limited to development footprint site.** • **Dust must be managed and control on site.** • **All construction vehicles must be serviced to prevent access exhaust emissions and noise.**
Residual impacts:	**Health impacts**
Cumulative impact post mitigation:	**The surrounding environment will not be affected by construction activities**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**24 – Low**
OPERATIONAL PHASE. Not applicable	
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Similar to construction phase.**

TERRESTRIAL BIODIVERSITY IMPACTS

Development Construction	**TERRESTRIAL BIODIVERSITY IMPACTS**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Terrestrial Biodiversity Impacts**
Nature of impact:	**Discussion:** The vegetation type is classified as least threatened. No terrestrial CBA or ESA's were mapped on the development area. No protected area or priority areas for protected area expansion are inside the study area. No

	indigenous forests are inside or close to the study area.
Extent and duration of impact:	**Extent (footprint) & Duration (Construction period)**
Magnitude:	**Moderate**
Consequence of impact or risk:	**Loss or impacts on indigenous vegetation**
Probability of occurrence:	**Definitive**
Degree to which the impact may cause irreplaceable loss of resources:	**Moderate**
Degree to which the impact can be reversed:	**Cannot be reversed**
Indirect impacts:	**Disturbance to surface area can result in impacts on indigenous vegetation**
Cumulative impact prior to mitigation:	**Habitat fragmentation, loss of ecological connectivity and erosion**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**High**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**High**
Proposed mitigation:	• **Demarcate no-go areas before any land clearing occurs under the supervision of an ECO. Demarcation must be clearly visible and effective and no-go area must remain demarcated throughout construction phase. The no-go areas is the wetland area, boundary of the site and non-perennial river mapped.** • **Site clearance along the border of the no-go areas must be done under the supervision of an ECO.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**
OPERATIONAL PHASE	
Potential impact and risk:	**Impact on terrestrial biodiversity**
Nature of impact:	**None. Area will be developed**
Extent and duration of	**None. Area will be developed**

impact:	
Magnitude:	**None. Area will be developed**
Consequence of impact or risk:	**None. Area will be developed**
Probability of occurrence:	**None. Area will be developed**
Degree to which the impact may cause irreplaceable loss of resources:	**None. Area will be developed**
Degree to which the impact can be reversed:	**None. Area will be developed**
Indirect impacts:	**None. Area will be developed**
Cumulative impact prior to mitigation:	**None. Area will be developed**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**None. Area will be developed**
Degree to which the impact can be avoided:	**None. Area will be developed**
Degree to which the impact can be managed:	**None. Area will be developed**
Degree to which the impact can be mitigated:	**None. Area will be developed**
Proposed mitigation:	**None. Area will be developed**
Residual impacts:	**None. Area will be developed**
Cumulative impact post mitigation:	**None. Area will be developed**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**None. Area will be developed**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Impact on indigenous vegetation**
Nature of impact:	**Similar to that in the development phase.**

AQUATIC BIODIVERSITY IMPACTS

Development Construction	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Soil erosion and dust**
Nature of impact:	**Disturbance to soil which is caused during the construction may lead to erosion of the site and surrounds.**
Extent and duration of impact:	**Extent 1 (footprint) & Duration 1**
Magnitude:	**2**
Consequence of impact or	**Clearing and excavation activities can result in**

risk:	**erosion and dust.**
Probability of occurrence:	**2 (I)**
Degree to which the impact may cause irreplaceable loss of resources:	**2 (PR)**
Degree to which the impact can be reversed:	**PR**
Indirect impacts:	**Disturbance to surface area can result in erosion and dust generation**
Cumulative impact prior to mitigation:	**Exposing soil may lead to erosion and dust generation if not mitigated.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1 (CM)**
Proposed mitigation:	**Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate clearing areas only.** **Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately.** **Strict compliance with the EMPr.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**
OPERATIONAL PHASE	
Potential impact and risk:	**Soil erosion and dust**
Nature of impact:	**None. Area will be developed**
Extent and duration of impact:	**None. Area will be developed**
Magnitude:	**None. Area will be developed**
Consequence of impact or risk:	**None. Area will be developed**
Probability of occurrence:	**None. Area will be developed**

Degree to which the impact may cause irreplaceable loss of resources:	**None. Area will be developed**
Degree to which the impact can be reversed:	**None. Area will be developed**
Indirect impacts:	**None. Area will be developed**
Cumulative impact prior to mitigation:	**None. Area will be developed**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**None. Area will be developed**
Degree to which the impact can be avoided:	**None. Area will be developed**
Degree to which the impact can be managed:	**None. Area will be developed**
Degree to which the impact can be mitigated:	**None. Area will be developed**
Proposed mitigation:	**None. Area will be developed**
Residual impacts:	**None. Area will be developed**
Cumulative impact post mitigation:	**None. Area will be developed**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**None. Area will be developed**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Soil erosion and dust**
Nature of impact:	**Similar to that in the development phase.**

Development Construction	**Biological Aspect Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Loss of freshwater ecological habitat**
Nature of impact:	**No alternative development footprints are required. The development is appropriate and will not affect the status of the aquatic biodiversity features identified on site as a result of existing disturbances to the valley bottom wetland.**
Extent and duration of impact:	**Extent 1 (footprint) & Duration 1**
Magnitude:	**2**
Consequence of impact or risk:	**Clearing and excavation activities can result in erosion and dust.**
Probability of occurrence:	**2 (I)**
Degree to which the impact may cause irreplaceable	**2 (PR)**

loss of resources:	
Degree to which the impact can be reversed:	**PR**
Indirect impacts:	**Disturbance to surface area can result in erosion and dust generation**
Cumulative impact prior to mitigation:	**Exposing soil may lead to erosion and dust generation if not mitigated.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1 (CM)**
Proposed mitigation:	**Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate clearing areas only.** **Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately.** **Rehabilitation of the wetland by attending to alien invasive plant clearing and removal of litter and building rubble in site wetland and creating of buffer around wetland of at least 15m, except for the GAP housing portion on the north and north east of the wetland.** **Creating of stormwater detention after culvert before stormwater is released into the existing drainage line and valley bottom wetland releasing stormwater on site into the Jan Dissels River. Rehabilitation of the existing stormwater pond by reshaping it and removal of alien invasive plants in the upper section of the valley bottom wetland and drainage line where into the discharged stormwater from the bigger wetland will be discharged before detained in on site stormwater pond on specially created open space erf in the development footprint.** **Strict compliance with the EMPr.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**

Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**
OPERATIONAL PHASE	
Potential impact and risk:	**Loss of freshwater ecological habitat**
Nature of impact:	**The wetland is already degraded and the proposed development will not result in further degradations.**
Extent and duration of impact:	**Extent 1 (footprint) & Duration 1**
Magnitude:	**2**
Consequence of impact or risk:	**Clearing and excavation activities can result in erosion and dust.**
Probability of occurrence:	**2 (I)**
Degree to which the impact may cause irreplaceable loss of resources:	**2 (PR)**
Degree to which the impact can be reversed:	**PR**
Indirect impacts:	**Disturbance to surface area can result in erosion and dust generation**
Cumulative impact prior to mitigation:	**Exposing soil may lead to erosion and dust generation if not mitigated.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very high**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1 (CM)**
Proposed mitigation:	**Ongoing alien invasive plant control and clearing and litter removal.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**
DECOMMISSIONING AND CLOSURE PHASE	

Potential impact and risk:	Loss of freshwater ecological habitat
Nature of impact:	**Not Applicable.**

IMPACT ASSESSMENT

Aquatic Biodiversity Impact Assessment Addendum_Clanwilliam Housing and WWTW V1.0

Van Zyl, K. and Morton, R. 2026. Aquatic Biodiversity Impact Assessment Addendum: Stormwater Management and WWTW Expansion, Clanwilliam Housing Development, Remainder Erf 279, Clanwilliam V1.0. Delta Ecology. RSA.

Stormwater Infrastructure

Runoff from about 1 277 erven, roads and community facilities will be concentrated at 21 headwalls and four attenuation ponds (UDS Africa, 2026b), several of which discharge into or next to the retained central valley bottom wetland system. During construction, the outlet, pipe trench and pond footprints will disturb wetland and buffer habitat and expose soil to erosion, with a risk of sediment, cement and hydrocarbons reaching the wetland. Pond 7 alone, which forms part of the central valley-bottom wetland system, has a storage volume of about 4 850 m³.

In operation, the main impact is a change in the hydrological regime of the valley bottom wetland system. Increased and more frequent inflows can lengthen the period of saturation, favouring Typha capensis over seasonal wetland vegetation, and concentrated inflows risk channel incision that would convert parts of the unchannelled wetland into a channelled system. EnviroSwift (2025) noted this risk unless post-development flows are limited to pre-development levels. Poorly dissipated outlets can cause scour and headcut erosion, and urban runoff will carry sediment, litter, hydrocarbons, nutrients and faecal bacteria into the wetland.

If appropriately designed as a treatment train and implemented together with the Rehabilitation Plan, the proposed stormwater system provides an opportunity to improve the current condition and functioning of the wetland. The wetland is already highly influenced by urban stormwater and effectively forms part of the existing stormwater drainage system, receiving unmanaged runoff and other impacts from the developed areas upslope. UDS intends to incorporate and treat stormwater from the existing informal settlement that currently enters the valley-bottom wetland system untreated (C. Louw, pers. comm., 25 September 2026). This, together with rehabilitation of the wetland, could improve the quality of water entering the system and reduce some of the existing impacts.

The intention should therefore not be to remove the wetland from the stormwater system, but to rehabilitate it so that it functions more effectively as a wetland within this already modified urban setting. Rehabilitation should improve vegetation cover, reduce erosion and channelisation, and promote the spreading and slowing of flows through the valley bottom. This would improve the wetland's ability to provide ecosystem services such as flow attenuation, sediment trapping, nutrient assimilation and water- quality enhancement, while also improving wetland habitat.

The wetland ultimately drains towards the Jan Dissels River and its associated floodplain. Given the very high ecological importance and sensitivity of the Jan Dissels River, the combined stormwater and wetland rehabilitation design should aim to improve both the quality and the hydrological characteristics of water leaving the site. Adequate attenuation and energy dissipation at stormwater outlets, together with rehabilitation of the receiving wetland, are therefore important to reduce erosion, manage peak flows and improve the quality of water ultimately reaching the Jan Dissels River.

WWTW Refurbishment and Expansion

Effluent quality. Effluent compliance has been poor in every assessment from 2011 to the 2023/24 Green Drop audit, when microbiological compliance was 0% (BVi, 2024; DWS, 2022; 2026), and no results since the refurbishment were available. Effluent quality is a property of the works as a whole rather than of each source of sewage, so it is assessed for the upgraded works in one impact. The housing development would contribute about 18% of the load on the upgraded works (about 640 of 3 600 m³/day), and BVi (2024) found that the existing works could not accommodate the housing development's flow without being repaired and upgraded. Sampling in September 2026 (Section 4.6) showed that the river downstream of the works is already strongly influenced by treated effluent: ammonia increased from 0.07 to 6.0 mg N/l, with estimated un-ionised ammonia above the Chronic Effect Value for aquatic ecosystems, EC increased at least sevenfold, inorganic nitrogen reached eutrophic levels and E. coli increased from 90 to 300 cfu/100 ml. Although the receiving reach is already impacted, an expanded works operating without the recommended mitigation would discharge a larger volume of poor-quality effluent to a river of Very High ecological importance and sensitivity, so the impact is of High significance before mitigation. The aim of the refurbishment and upgrade is to treat the effluent to the Special Limit Values, including COD below 30 mg/l, ammonia below 2 mg/l and phosphate below 1 mg/l (BVi, 2024). If this is achieved, the quality of effluent reaching the Jan Dissels River will improve substantially compared with the status quo. This is a positive impact, and the refurbishment and upgrade of the works are therefore supported and encouraged. It is, however, a design objective rather than a certain outcome. Although the existing plant has been refurbished (C. Louw, pers. comm., 25 September 2026), BVi (2024) notes that oxidation ditch plants are maintenance-intensive, and compliance will depend on operation, maintenance, backup power and funding. Given the long history of non-compliance at the works, the additional capacity of the new module will need additional support, in the form of skilled staff, specialist oversight, maintenance and funding, to be operated to the Special Limit Values. Process failures that release ammonia, organic load, nutrients and faecal bacteria, and residual chlorine from disinfection is toxic to aquatic life. Construction also carries a risk of temporary deterioration or bypassing while units are refurbished and tied in.

Effluent volume. The existing WWTW has a stated design capacity of about 2.4 Ml/day and was receiving about 2.2 to 2.26 Ml/day at the time of the BVi (2024) assessment. The proposed works include a new 1.5 Ml/day treatment module, and the upgraded works is intended to accommodate at least 3.6 Ml/day under peak conditions (BVi, 2024; C. Louw, pers. comm., 25 September 2026). Inflow will grow gradually as the town grows over about 15 years. Part of the effluent is used to irrigate the golf course all

year, and the rest drains through the reed bed associated with the southern seep to the Jan Dissels River. DWS (2022) reports that about 80% of the effluent was irrigated and 20% discharged to the Jan Dissels River. Applied to the flow reported at the time (about 2.1 Ml/day, 70% of a design capacity of 3 Ml/day), this indicates that roughly 0.4 Ml/day (about 5 l/s) reached the river. In the absence of a future water balance, a conservative scenario has been adopted in which the full additional treatment capacity of 1.5 Ml/day (about 17 l/s) could ultimately be discharged towards the Jan Dissels River. This is a theoretical upper-bound scenario rather than the predicted discharge, as part of the treated effluent is expected to continue to be reused for irrigation. Because the town's potable water is abstracted upstream, treated effluent may make up a large share of the flow in the receiving reach in summer. A sustained increase in discharge can alter the flow regime of the river, for example by maintaining flow in reaches that would naturally dry to pools in summer, and reduces the dilution available where natural flow is low. The receiving reach is, however, not natural: below the reed bed associated with the southern seep, the river flows for about 4.7 km past the eastern edge of Clanwilliam and through farmland before joining the Olifants River below Clanwilliam Dam, and it is more disturbed than the reach upstream of the works (Section 4.1). This moderates the significance of a change in flow. The reed bed associated with the southern seep provides some polishing before the effluent reaches the river, and the southern seep is expected to enlarge with the increased flow. The water chemistry at the downstream point (Section 4.6) suggests that treated effluent already made up a large share of the flow there at the end of the wet season. If DWS require a hydrological assessment for the expansion of the WWTW, this report may need to be updated.

Housing development share. The effluent generated by the housing development itself is a separate and much smaller quantity than the full expansion. BVi (2024) estimated that the originally proposed 1 158 stands would generate about 579 m³/day of sewage, about 0.5 m³/day per stand. Applying the same per- stand allowance to the current layout of about 1 277 erven gives an indicative flow of about 640 m³/day (about 7.4 l/s), or just over 40% of the new 1.5 Ml/day module, with the rest of the module providing for about 15 years of growth of the town (C. Louw, UDS Africa, pers. comm., 25 September 2026). If the 80:20 split reported by DWS (2022) continued, about 130 m³/day (1.5 l/s) of this would reach the river, and in the upper-bound scenario all 640 m³/day (7.4 l/s). The flow impacts of the housing development and of the full expansion are therefore assessed separately, as Impacts 8a and 8b (Table 5-1).

Flow context. Van der Berg (2008)[1] reports that the Jan Dissels River has a mean annual runoff of about 43 million m³, with low flows from December to March. The upper catchment is near-pristine, but the lower river is in a poor (Category D) state because of abstraction and agriculture: about 3.3 million m³ a year is abstracted for agriculture and 0.8 million m³ by the municipality and the town furrow, and the ecological Reserve is not met at the lower end of the river for at least three months of the year, when more than 400 000 m³ would need to be freed up to meet it. This is consistent with the site assessment, which found that the Jan Dissels floodplain downstream of the potable water abstraction point appears to have dried out.

[1] The study dates from 2008; abstraction and flows may have changed.

In this context, given the extent of abstraction from the lower Jan Dissels River, the additional discharge could be seen as partly returning water to a reach whose dry-season flows are already below the ecological requirement, and it is unlikely to create excessive flows at a catchment scale. This interpretation is, however, limited. No current flow or abstraction data, or water balance for the works, were available; the abstraction figures date from 2008 and may have changed; and the timing of future discharges relative to the dry-season deficit is unknown. In addition, treated effluent cannot be regarded as equivalent to natural ecological flow. It differs in quality, temperature, timing and seasonality, it enters the river at a single point, and the water quality results (Section 4.6) show that it already has a substantial influence on the river. As broad catchment context only, the full additional capacity of 1.5 Ml/day would amount to about 1.3% of the mean annual runoff over a year (about 0.5% for the housing development). The relative contribution of the effluent, and its effect, will however be greatest during the December to March low- flow period, which an annual average does not reflect. The quality of the effluent (Impact 7) therefore remains the main concern, together with its share of the summer low flow. Van der Berg (2008) also recommended that the town's dry-season abstraction be switched from the Jan Dissels River to Clanwilliam Dam.

Olifants River. The Jan Dissels River joins the Olifants River about 4.7 km downstream of the effluent release, just below Clanwilliam Dam (Van der Berg, 2008). This reach of the Olifants is not pristine: its flow is regulated by the dam, its PES was rated between D - F[2] in the NBA 2018 (Van Deventer et al., 2019), and its floodplain wetland is largely modified (PES D; Table 4-1), although its EIS is Very High (Table 4-7). The additional effluent is small relative to the combined flow of the Jan Dissels and the regulated Olifants, so a measurable change in the flow of the Olifants is unlikely (Impact 11). Water quality impairment is possible, mainly from ammonia and nutrients carried down the Jan Dissels at low flow, although uptake in the reed bed associated with the southern seep and Jan Dissels River, nitrification over 4.7 km and dilution at the confluence would reduce concentrations (Impact 10)[3].

Southern seep. The southern seep below the golf course receives the treated effluent released from the works and has done so for many years. Its hydrology and water quality are already critically modified (F), and it is now sustained to a large degree by the effluent (Section 4.2). The additional effluent will therefore not introduce a new type of impact, which reduces the significance of the impacts on the seep. However, as the volume released increases with the growth of the town over about 15 years, the seep is likely to stay saturated for longer and to increase in extent (Impact 12). This can be reduced by irrigation reuse and storage, but not avoided. The quality of the water in the seep will continue to depend on that of the effluent (Impact 13). If the upgraded works meets the Special Limit Values, the quality of the water entering the seep will improve compared with the status quo, while process failures would continue to affect it directly. As the seep expands, its capacity to polish the effluent before it reaches the Jan Dissels River is also likely to increase. Both impacts on the seep are therefore of Low

[2] This PES is associated with where the Olifants River has been transformed into the Clanwilliam Dam.
[3] No water quality data are available for the Olifants River at the confluence.

significance, given the degree of disturbance it already exhibits (hydrology and water quality critically modified, PES E).

Golf course irrigation. Soils and turf can retain suspended solids and part of the organic load and take up nutrients, but how much depends on irrigation rates relative to turf demand, soils, depth to groundwater and distance to the watercourse, none of which have been quantified. The golf course lies next to and partly within the wetland system, so over-irrigation, or irrigation in winter, would carry nutrients, salts and bacteria to the central valley bottom wetland system and ultimately to the Jan Dissels River. Irrigation is therefore not relied on as mitigation in this addendum. DWS (2026) also observed final effluent overflowing at the works because the golf course was not taking enough for irrigation, which shows that the volume irrigated is limited by demand[4]. Under GN 665 (Government Gazette 36820, 6 September 2013), the irrigation of land with treated domestic and biodegradable industrial wastewater is subject to specific limits and conditions. The General Authorisation permits the irrigation of up to 2 000 m³/day of wastewater, provided that the applicable water quality standards and other conditions of the authorisation are met. The irrigation area must also comply with specified separation distances from water resources and other sensitive features, including the 1:100-year floodline or riparian habitat, a minimum 100 m from a watercourse, more than 500 m from boreholes used for drinking water or stock watering, and outside a 500 m radius of a wetland. The irrigation system must be managed to prevent waterlogging, pooling, contaminated runoff and contamination of nearby water resources. The volume of wastewater used for irrigation must be monitored and recorded to demonstrate compliance with the applicable limits.

The golf course lies next to and partly within the central valley bottom wetland system and the southern seep and is to be extended, so the irrigation cannot meet these separation distances and must be authorised under a water use licence (section 21 (e)) rather than the General Authorisation.

Impact significance

Table 5-1 summarises the significance of each impact before and after mitigation, and the detailed scoring is given in **Annexure C**. These ratings are preliminary and precautionary. They take into account that the central valley bottom wetland and the southern seep are seriously modified (PES E) and of Moderate EIS, and that the Jan Dissels River is largely modified (PES D), of Very High EIS and part of a CBA 1 corridor that joins the Olifants River (Very High EIS) about 4.7 km downstream of the WWTW (Section 4).

The water quality results (Section 4.6) show that the effluent already affects the Jan Dissels River, so the likelihood of Impact 7 without mitigation has been raised from likely to definite. Given the larger volume of effluent from the expanded works, the long record of non-compliance and the Very High ecological importance and sensitivity of the river, Impact 7 is of High significance before mitigation (3.83). Impact 7 remains of Medium significance after mitigation (2.61), rather than Low, because of the long history of non-compliance at the works and because the additional capacity will require additional

[4] No exact date is provided

operational support (Section 5.2). The southern seep and historical non-perennial river south-east of the WWTW, which receive the treated effluent, are already seriously to critically modified (water quality F; riparian IHI F), and the floodplain wetlands are largely modified (PES D). The floodplain wetlands are covered by Impacts 7, 8a and 8b. The southern seep is assessed separately (Impacts 12 and 13) because it is likely to expand as the volume of effluent increases; both impacts are of Low significance, given the degree of disturbance it already exhibits (hydrology and water quality critically modified, PES E). The results do not change the other ratings, which will be reviewed again if post-refurbishment effluent results become available and show that special limits are met, Impacts 8a and 8b take into account the existing over-abstraction of the lower Jan Dissels River (Van der Berg, 2008), Impacts 10 and 11 cover the Olifants River downstream of the confluence, and Impacts 8a and 8b have been rated on the conservative upper-bound flow scenario described in Section 5.2.

During construction, disturbance of wetland habitat, erosion and sedimentation, and water quality impairment are of Medium significance before mitigation. Building the piped connection within the central valley-bottom wetland system, outlets and proposed Rehabilitation activities will disturb wetland habitat, the sandy soils of the site erode easily, and tie-ins at the WWTW carry a risk of untreated sewage reaching
the Jan Dissels River. With no-go areas, dry-season construction, sediment controls and a contingency plan for the WWTW tie-ins, all three are reduced to Low significance.

During operation, the altered hydrological regime of the wetlands, erosion at the outlets, urban stormwater quality and nutrient loading from irrigation are of Medium significance before mitigation and Low after mitigation. This depends on peak flows being attenuated to pre-development levels, outlets discharging diffusely through energy dissipators, a stormwater treatment train being installed and maintained, and irrigation being matched to turf demand.

Treated effluent quality (Impact 7) is of High significance before mitigation, reflecting the poor compliance record of the works in every assessment since 2011 (Section 2.2) and the larger volume of effluent from the expanded works. Mitigation reduces it to Medium significance (from 3.83 to 2.61), but not to Low. Given the history of non-compliance, and because the additional capacity will need additional operational support, compliance with the Special Limit Values cannot be assumed. The refurbishment and upgrade of the works, which aim to treat the effluent to the Special Limit Values, would be a positive impact compared with the status quo and are encouraged.

The change in flow in the Jan Dissels River associated with the housing development itself (Impact 8a) is of Medium significance before mitigation and Low significance after mitigation. The housing development is expected to contribute approximately 640 m^3/day, of which only a portion is likely to reach the river while treated effluent continues to be reused for irrigation. The lower Jan Dissels River is also already affected by abstraction, with historical information indicating that summer flows fall below the ecological Reserve. On this basis, the additional flow attributable specifically to the housing development is unlikely to result in a significant alteration of the receiving river after mitigation.

The change associated with the full expansion of the WWTW (Impact 8b) remains of Medium significance after mitigation. The additional 1.5 Ml/day treatment capacity provides for broader growth of Clanwilliam over approximately 15 years and represents a larger and progressively increasing change in discharge. In the absence of a water balance and current river-flow data, the proportion that will ultimately reach the Jan

Dissels River cannot be reliably quantified. A precautionary Medium residual significance is therefore retained for the full expansion. The lower Jan Dissels River is already over-abstracted and its summer flows fall below the ecological Reserve (Van der Berg, 2008), so the additional discharge is unlikely to create excessive flows and could be seen as partly offsetting the dry-season deficit, although this cannot be confirmed without current flow and abstraction data. Treated effluent is, however, not equivalent to natural flow, and its quality remains the main concern (Impact 7).

Water quality impairment in the Olifants River downstream of the confluence (Impact 10) is of Medium significance before mitigation and Low after mitigation, and a change in its flow (Impact 11) is of Low significance, because the Olifants is regulated by Clanwilliam Dam and the additional effluent is small relative to its flow.

The increase in effluent volume is likely to lengthen saturation and increase the extent of the southern seep as the town grows (Impact 12), and the quality of the water in the seep will continue to depend on that of the effluent (Impact 13). Both are of Low significance before and after mitigation, given the degree of disturbance it already exhibits (hydrology and water quality critically modified, PES E).

Table 5-1: Summary of impact significance.

Impact	Phase	Without	With	Key mitigation
1. Disturbance of wetland habitat (stormwater	Construction	Medium (2.74)	Low (2.03)	No-go areas; narrow working width; dry-season construction
2. Erosion and sedimentation of the wetlands	Construction	Medium (2.83)	Low (1.90)	Sediment controls; rehabilitation
3. Water quality impairment during construction, incl. WWTW works	Construction	Medium (2.95)	Low (2.05)	No bypass; contingency plan; spill control
4. Altered hydrological regime of Central VBW	Operation	Medium (3.18)	Low (2.50)	Attenuation to pre-development peaks; diffuse discharge
5. Erosion at stormwater outlets	Operation	Medium (2.79)	Low (1.64)	Energy dissipators; maintenance
6. Water quality impairment from urban stormwater	Operation	Medium (3.25)	Low (2.50)	Treatment train; litter traps
7. Treated effluent quality in the Jan Dissels River	Operation	High (3.83)	Medium (2.61)	Special Limit compliance; specialist process engineer and works manager; additional operational support; periodic effluent monitoring; chlorine control

8a. Altered flow regime of the Jan Dissels River from the housing	Operation	Medium (2.96)	Low (2.32)	Irrigation reuse matched to demand; volume metering; water-efficient fittings
8b. Altered flow regime of the Jan Dissels River from the full expansion of	Operation	Medium (3.03)	Medium (2.71)	Water balance; storage; irrigation reuse; volume metering
9. Nutrient and salt loading from golf course	Operation	Medium (3.15)	Low (2.40)	Irrigation management plan
10. Water quality impairment in the Olifants River downstream of the confluence	Operation	Medium (2.98)	Low (2.37)	Special Limit compliance; reed bed retention; monitoring above and below the confluence
11. Altered flow regime of the Olifants River downstream of the confluence	Operation	Low (2.37)	Low (2.27)	Volume metering; water balance
12. Altered hydrological regime and extent of the southern seep	Operation	Low (2.35)	Low (2.20)	Water balance; irrigation reuse and storage; diffuse release through the reed bed; annual mapping of the seep
13. Treated effluent quality in the southern seep	Operation	Low (2.45)	Low (2.20)	Special Limit compliance; specialist process engineer and works manager; effluent monitoring

Under the no-go alternative, the central valley bottom wetland would remain unrehabilitated and would continue to receive unmanaged stormwater from the informal settlement and township, and the existing WWTW, which has a long record of non-compliant effluent, would continue to operate close to its capacity as the town grows. This is a continuing negative impact of Medium significance on the wetland and the Jan Dissels River.

ANIMAL SPECIES

The likely impacts on Sensitive Species 32 during the construction phase of the development, for the two alternatives.

	Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Loss of a section of habitat, particularly the rocky ridge limited	Loss of habitat. Also, noise disturbance during construction.	None, apart from potential habitat loss due to existing

	to a small area in the western section of the site next to the existing town. Also, noise disturbance during construction.		residential activities in close proximity.
Extent and duration of impact	Largely confined to the study area; development would remove the habitat to sustain this species, and the mobility of this species in the surrounding landscape. Permanent on the development area considering the habitat will be destroyed.	Largely confined to the study area; development would remove the habitat to sustain this species, and the mobility of this species in the surrounding landscape. Permanent on the development area considering the habitat will be destroyed.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Consequences of impact or risk	High, destructive impact. Potential habitat will be lost.	High, destructive impact. Potential habitat will be lost.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Probability of occurrence	Probable; Due to potential habitat loss.	Probable; Due to potential habitat loss.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the eventual local disappearance of this species from the study area, if it is present.	If unmitigated, this could result in the eventual local disappearance of this species from the study area, if it is present.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Degree to which the impact can be reversed	Habitat loss would be impossible to replace/reverse on site.	Habitat loss would be impossible to replace/reverse on site.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Indirect impacts	None	None	None
Cumulative impact prior to mitigation	High (-)	High (-)	High (-)
Significance rating of impact prior to mitigation	High (-)	High (-)	High (-)
Can these impacts be mitigated?	No	No	No
Proposed mitigation	No unsupervised workers on the property and ensuring that no animals are captured on the property (close supervision).		

Degree of confidence	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visit)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visit)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visit)
Significance of impacts on the development	Medium. Species not recorded on site and unlikely to be present due to closeness of existing residential activities.		

Circus maurus*,* was not recorded during the survey.

This species main distribution centred on the fynbos and karoo inland of that. Black Harriers breed in the montane fynbos, renosterveld and strandveld habitats of the Western Cape and many individuals disperse into the karoo and grassland habitats during the autumn and winter months. This species prefers coastal and mountain fynbos, highland grasslands, Karoo sub-desert scrub and open plains with low shrubs and croplands. Harriers breed close to coastal and upland marshes, damp sites, near vleis or streams with tall shrubs or reeds. There are wetlands east of the site associated to the Jan Dissels River and in adjacent areas that could potentially be suitable, but it is unknown if they occur there or not. In the event that they did occur in the area, the proposed project would have no effect on them. No nests of any birds were found within the footprint area and the although they may use the area for foraging, significant undisturbed and indigenous vegetation in good quality that provide foraging grounds existing to the south of the site and town and east towards the Jan Dissels river and beyond that the Cederberge.

The likely impacts on *Circus maurus* during the construction phase of the development, for the two alternatives.

	Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Loss of a section of roaming and foraging habitat, particularly the citrusdal vygieveld Also, noise disturbance during construction.	Loss of a section of roaming and foraging habitat, particularly the citrusdal vygieveld Also, noise disturbance during construction.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Extent and duration of impact	Largely confined to the study area; development would remove the foraging habitat to sustain this species. Permanent on the development area considering the habitat will be destroyed.	Largely confined to the study area; development would remove the foraging habitat to sustain this species. Permanent on the development area considering the habitat will be destroyed.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Consequences of impact or risk	High, destructive impact. Potential habitat will be lost.	High, destructive impact. Potential habitat will be lost.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Probability of	Probable;	Probable;	None, apart from

occurrence	Due to habitat loss.	Due to habitat loss.	potential habitat loss due to existing residential activities in close proximity.
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the eventual local disappearance of this species from the study area, if it is present.	If unmitigated, this could result in the eventual local disappearance of this species from the study area, if it is present.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Degree to which the impact can be reversed	Habitat loss would be impossible to replace/reverse on site.	Habitat loss would be impossible to replace/reverse on site.	None, apart from potential habitat loss due to existing residential activities in close proximity.
Indirect impacts	None	None	None
Cumulative impact prior to mitigation	High (-)	High (-)	High (-)
Significance rating of impact prior to mitigation	High (-)	High (-)	High (-)
Can these impacts be mitigated?	No	No	No
Proposed mitigation	No unsupervised workers on the property and ensuring that no animals are captured on the property (close supervision).		
Degree of confidence	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visit)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visit)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visit)
Significance of impacts on the development	Medium. Species not recorded on site and unlikely to be present due to closeness of existing residential activities. Significant suitable habitat to the south and east that the species will prefer to utilize due to on site disturbance impacts		

POTENTIAL IMPACTS ON HERITAGE AND CULTURAL ASPECTS

CONCLUSION

The broader Cederberg area is renowned for its rock art and significant associated archaeology. Clanwilliam and its access via the Botterkloof Pass road act as a gateway from the N7 into the rest of the Cederberg area. Clanwilliam retains a number of historic farmsteads in the area, as well as excellent examples of vernacular architecture and Provincial Heritage Sites all oriented along the structuring elements of Hoof Street, Park Street and Ou Kaapse Road. As noted above, Clanwilliam suffered when the community of Sederville was moved and their houses demolished and as a result, very little historic fabric remains within the Sederville area.

The proposed development site is predominantly underlain by the Nardouw Subgroup,

specifically the Rietvlei Formation. Both the Nardouw Subgroup and the Rietvlei Formation are characterised by low palaeontological sensitivity, as they generally do not contain fossils of significant scientific or heritage value. This conclusion aligns with previous studies, which have consistently indicated that these formations are not typically rich in palaeontological resources. The potential impact of the proposed development on palaeontological resources is assessed as minimal, with a low likelihood of encountering any significant fossil material during construction. Additionally, the Goudini, Skurweberg, and Rietvlei Formations, which are also present in the broader area, share similarly low palaeontological sensitivity. As a result, no specific mitigation measures are required for the proposed residential development. While no specific mitigation strategies are required, it is recommended that the Chance Fossil Finds Procedure be implemented during the construction phase. This protocol will ensure that any unexpected fossil discoveries are promptly reported and appropriately managed, safeguarding potential heritage resources. As noted above, the archaeology field assessment did not identify any visible evidence of the supply depot and field hospital located on the Clanwilliam commonage from the South African War mentioned above, although buried evidence of this infrastructure may be present beneath the ground surface. This development activity comprises infill development within the existing urban edge of Clanwilliam. The area proposed for development is located between two areas that have been identified as having historic value and are proposed as <Heritage Zones= (Park Street precinct - Zone E - and Sederville precinct - Zone G) in the Clanwilliam SDF (2023, Figure 7). In order to ensure that the proposed development fits into this infill space, the following recommendations are proposed:

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space
- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Larger erven are positioned in the space between Zone G and Zone E
- Architectural guidelines are developed for the area between Zone G and Zone E
- Adherence to the historic grid alignment oriented around Park Street, Hoof Street and Ou Kaapse Road
- Sufficient breathing space and appropriate hierarchies in response to the significant heritage resources identified. In order to ensure that no impact to heritage resources occurs during the construction or operational phases of the development, recommendations are made below.

8. RECOMMENDATIONS

There is no objection to the proposed development from a heritage perspective on condition that:

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order to retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space. This would require the reallocation of approximately 50 GAP housing erven.

This was mitigated in the preferred layout. See screen shots below of the area

Preferred layout accommodating mitigation measures

Alternative layout before mitigation

- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Due to the position of the proposed development between two areas that have been identified as having heritage value, additional design detail be submitted to HWC for approval as a condition of a positive comment on this HIA. The architecture of the proposed development should adhere to the Guidelines included as Appendix 3.
- The attached Chance Fossil Finds Procedure is implemented for the duration of construction activities
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.

POTENTIAL IMPACTS ON TRAFFIC

CONCLUSIONS

The following can be concluded/summarised from the report:

17. This TIS accompanies the Application for Rezoning and Subdivision of Erf RE279, Clanwilliam.
18. The proposed development areas constitute Clanwilliam's Integrated Residential Development Programme (IRDP) and Upgrading of Informal Settlements Programme (UISP).
19. The total proposed subdivision includes 160x Residential Zone 1 erven, 1 155x Residential Zone 2 erven, 5x Community Zone 1 erven (1x Community Centre – 800 seats, 3x Crèche – 140 students, and 1x School – 500 students), 7x Community Zone 2 erven (Churches – 830 seats), 1x Community Zone 3 erf (Clinic – 443.4 m^2 GLA), 4x Local Business Zone 2 erven (± 3 026 m^2 GLA) and 1x Authority & Utility Zone erf (Police Station – ± 772.2 m^2 GLA).
20. The subject development areas are currently accessible via the residential streets leading to/from Ou Kaapse Way. Several additional and/or upgraded access points from/to the existing public road network are proposed for the future.
21. Traffic counts were conducted at 9 intersections in the vicinity of the proposed development areas on Thursday, 14 March 2024 during the AM (06:00 to 09:00) and PM (15:30 to 18:30) peak periods.
22. The proposed development has the potential to generate 523 AM peak hour trips (193 in, 330 out) and 471 PM peak hour trips (289 in, 182 out). These trips were distributed to/from the main streets intersecting Ou Kaapse Way.
23. Traffic analyses were performed for the most traversed sections of Graafwater Way, Main Road and Ou Kaapse Way as well as the three intersections with the highest total expected 2029 peak hour traffic volumes (Graafwater Way/Main Road, Ou Kaapse Way/Voortrekker Street/Denne Street, and Ou Kaapse Way/De Villiers Street/Bloekom Street). No upgrades are considered necessary to accommodate the total expected 2029 peak hour traffic. Nonetheless, mention is made of the potential benefits of the planned bypass road from the entrance of the town (Graafwater Way) to the industrial area (i.e. bypassing Main Road and most of the northern section of Ou Kaapse Way), which was identified as a need in the Cederberg Municipality Local Integrated Transport Plan 2020 – 2025.
24. For the new proposed local streets in the development areas, a road reserve of 10 m (typical for Class 5B local residential streets) is proposed for the residential areas, while 16 m (typical for Class 5B local commercial streets with on-street parking) is proposed for the main roads in Development Area 1 and Development Area 3.
25. The development areas' new/upgraded intersections are to be sign-controlled (i.e. stop or yield).
26. Further elements of the new streets, such as cross sections, right of way, kerb radii and sight distances are expected to be specified in the final road designs and will require separate assessment and approval based on the applicable standards.
27. Based on the information received, refuse removal will be carried out by the municipality via kerbside collection, as is current practice in the surrounding area.
28. The future parking layouts are expected to be addressed during each erf's building plan
29. application process and should comply with the requirements set out in the latest.

30. Due to its unpractical location, Clanwilliam's existing formal minibus taxi rank (situated on the corner of Mark Street and Visser Street) is not in use at present. Instead, minibus taxis operate from the front of Spar on Main Road. The relocation of Clanwilliam's rank has been identified as a prioritised project in the municipality's transport plan, and a new site has been proposed along the eastern side of Ou Kaapse Way opposite Rooitee Street. Appropriate taxi/bus stops and turning facilities need to be provided where applicable.
31. Sidewalks of at least 1.5 m should be provided inside the road reserves of the new main streets to tie in with the existing and planned pedestrian facilities and/or routes.
32. Further formal public- or non-motorised transport facilities are not deemed necessary for the proposed development areas.

RECOMMENDATIONS
From the discussions provided in this report, it is recommended that the proposed development (Clanwilliam IRDP and UISP), indicated on the attached Subdivision Plan, be supported from a traffic impact perspective.
We trust that the Traffic Impact Assessment will be to your satisfaction and will gladly provide any additional information required on request.

(B) IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

This development is a housing project and the operational phase is town management as per the current management requires for all residential areas. The application for Environmental Authorization is for the development of the infrastructure and does therefore not include the operational phase. Management and mitigation measures were however included in the EMP under operational requirements.

(C) IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING PHASE

It is not anticipated that decommissioning will occur in the near future. Should decommissioning occur, the expected impacts are similar to those listed in the construction phase above with the additional positive impact of rehabilitating the decommissioned area to a near natural/indigenous state and negative impact of destroying houses and infrastructure. Impacts must be mitigated and managed according to the best practise techniques/management measures available for that time.

(D) IMPACTS THAT MAY RESULT FROM THE NO DEVELOPMENT ALTERNATIVE

The No-Go option will result in the site remaining as it is presently. This will result in the not being able to develop much needed housing opportunities or to expand the WWTW.

IMPACT TABLES-NO-GO

GEOGRAPHICAL AND PHYSICAL

SOIL EROSION AND DUST

Preferred alternative	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Not applicable**
OPERATIONAL PHASE	
Potential impact and risk:	**Soil erosion**
Nature of impact:	**Storm water channels prone to erosion.**
Extent and duration of impact:	**Extent 2 & Duration 3 (5 – 15 years)**
Consequence of impact or risk:	**Possible pollution of surface and ground water.**
Magnitude	**4 (will cause a slight impact on processes)**
Probability of occurrence:	**4 (most likely)**
Degree to which the impact may cause irreplaceable loss of resources:	**2-Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**Partly reversible (PR)**
Indirect impacts:	**Pollution of water resources.**
Cumulative impact prior to mitigation:	**Erosion and impact on surrounding environment.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**36-Medium**
Degree to which the impact can be avoided:	**Low**
Degree to which the impact can be managed:	**Low**
Degree to which the impact can be mitigated:	**3**
Proposed mitigation:	**NA**
Residual impacts:	**Soil erosion.**
Cumulative impact post mitigation:	**Soil erosion.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Not applicable**

IMPACT ON FRESHWATER ECOLOGY FEATURES – RELEASE OF POOR QUALITY TREATED EFFLUENT

Preferred alternative	**Geographical and Physical Impacts**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Not applicable**

OPERATIONAL PHASE	
Potential impact and risk:	**Poor treated effluent released affecting freshwater ecology**
Nature of impact:	**Poor treated effluent released affecting freshwater ecology**
Extent and duration of impact:	**Extent & Duration Long term – Permanently as long as poor treated quality effluent is released.**
Consequence of impact or risk:	**Pollution of surface and ground water.**
Magnitude	**Very high**
Probability of occurrence:	**Definitely**
Degree to which the impact may cause irreplaceable loss of resources:	**2-Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**Can be reversed if treated effluent is released within quality standards.**
Indirect impacts:	**Pollution of water resources.**
Cumulative impact prior to mitigation:	**Negatively effecting freshwater ecology and water users downstream.**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Vey high**
Degree to which the impact can be avoided:	**Low**
Degree to which the impact can be managed:	**Low**
Degree to which the impact can be mitigated:	**High**
Proposed mitigation:	**Upgraded of WWTW**
Residual impacts:	**Negatively effecting freshwater ecology and water users downstream.**
Cumulative impact post mitigation:	**Negatively effecting freshwater ecology and water users downstream.**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**Not applicable**

Under the no-go alternative, the central valley bottom wetland would remain unrehabilitated and would continue to receive unmanaged stormwater from the informal settlement and township, and the existing WWTW, which has a long record of non-compliant effluent, would continue to operate close to its capacity as the town grows. This is a continuing negative impact of Medium significance on the wetland and the Jan Dissels River.

SECTION 7: SPECIALIST ASSESSMENTS, RECOMMENDATIONS AND CONCLUSIONS

Terrestrial Biodiversity

CONCLUSION AND RECOMMENDATIONS

The sampling and analysis of the site, provides suitable data and results to present an informed decision on the local ecology and terrestrial biodiversity features. The lists of species for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach. During the site visits, the different biodiversity features, habitat, vegetation and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and species observed were recorded. Searches for listed species of conservation concern at the site were conducted, but none were observed which required the recording of their location. The study recorded low and very low sensitivity areas within the development area. No terrestrial CBA or ESA were mapped on the impact area.

Please refer to the Aquatic Biodiversity assessment for more detail on the mapped Freshwater ecologic features and buffers with management and mitigation measures to protect them. Included in the Environmental Management Plan is management and mitigation measures too protect the groundwater resources.

No additional survey or further assessment is in the authors view recommended.

The proposed area as per the Site Development Plan will have relatively little terrestrial biodiversity and ecological impact on sensitivity areas and the surrounding terrestrial biodiversity features provided that the development stays within the Site Development Plan area and appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to.

Aquatic Biodiversity

CONCLUSION AND RECOMMENDATIONS

Enviro-EAP (Pty) Ltd was appointed to undertake a Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) analysis of the freshwater and riparian resources.

A site development plan layout amendment is required. The valley bottom wetland east of the development and golf course must be protected by a 15m wide buffer. In order to achieve this, the layout must be amended and the sewerage pipeline and pump station associated with an access road must be removed from the Site Development Plan in order to protect it. This will ensure that the development is appropriate and will not affect the status of the aquatic biodiversity features identified on site as a result of existing disturbances to the non-perennial river. Rehabilitation of the wetland by attending to alien invasive plant clearing and removal of litter and building rubble inside the wetland and creating of buffer around wetland of at least 15m, except for the GAP housing portion on the north and northeast of the wetland will protect the one wetland mapped. Creating stormwater detention after culvert before stormwater is released into the existing drainage line and valley bottom wetland releasing stormwater on site into the Jan Dissels River will protect the downstream valley bottom wetland. Rehabilitation of the existing stormwater pond by reshaping it and removal of alien invasive plants in the upper

section of the valley bottom wetland and drainage line where into the discharged stormwater from the bigger wetland will be discharged before detained in on site stormwater pond on specially created open space erf in the development footprint will protect the valley bottom wetland and stormwater discharged into the Jan Dissels river.
No Freshwater Ecosystem Priority Area (FEPA) was mapped which confirmed the low impact.

The peer review has identified a number of short-comings in terms of alignment with best practice in the field of aquatic biodiversity assessment. These are what EnviroSwift believes to be an incorrect classification of the on-site aquatic feature as a drainage line whereas it is in fact a wetland. This was corrected in this peer review report and as identified assessed as a valley bottom wetland. When assessed in terms of compliance with the gazetted Protocol for Aquatic Biodiversity Assessment the report is found to have the following critical flaws:

- Drawings such as an SDP that show the extent of the development and whether any aquatic features are being retained were absent in the Enviro-EAP Aquatic Biodiversity Assessment report. This was corrected and included as figure 2.
- Failure to consult the WCBSP (2023) as this would have confirmed the provincial biodiversity conservation importance of the downstream, receiving aquatic features (indicated as an Aquatic CBA). When the report was drafted, the 2017 WCBSP was applicable. It was however updated in this report to the 2023 version and the Aquatic ESA mapped on the assessment area was corrected in this report.
- Lack of proof of the methods used to classify and delineate the on-site freshwater features such as auger results. Had auger samples been taken within the feature, the lack of evidence of alluvial processes would have been identified and the feature correctly identified as a wetland. The auger sampling and delineations done by EnviroSwift was used to update this peer reviewed report.
- Failure to recommend the minimum buffer width; and. The recommended 15m buffer, except for the GAP housing areas in north and north east of the wetland was accommodated in the SDP. Furthermore, the SDP was amended and the road, stormwater pipe and sewerage pipeline on the downstream wetland east of the golf course was removed from the site development plan. An open space erf was created in the layout to accommodate a stormwater detention pond before stormwater is discharged into this wetland system. A 15 buffer area is therefore not required in this section as the development infrastructure and roads was removed from the preferred layout.
- Failure to present a reasoned authorisation opinion based on a thorough evaluation of the assessment criteria that comprises an Aquatic Biodiversity Assessment. This was corrected in the updated peer review report.

Aquatic Biodiversity Impact Assessment Addendum_Clanwilliam Housing and WWTW V1.0

Van Zyl, K. and Morton, R. 2026. Aquatic Biodiversity Impact Assessment Addendum: Stormwater Management and WWTW Expansion, Clanwilliam Housing Development, Remainder Erf 279, Clanwilliam V1.0. Delta Ecology. RSA.

The wetland systems associated with the proposed Clanwilliam Housing Development are seriously modified (PES E). The central valley bottom wetland system currently receives substantial volumes of polluted stormwater, and possibly sewage, from the informal settlement and township upslope, which flow through the wetland and on to the Jan Dissels River untreated to a large degree. The southern seep wetland currently receives treated (and for many years untreated) effluent from the WWTW. Water quality sampling showed that the Jan Dissels River downstream of the works is strongly influenced by treated effluent, with ammonia at levels likely to cause chronic toxicity to sensitive aquatic biota, eutrophic nitrogen concentrations and increased E. coli.

The proposed stormwater design, combined with the rehabilitation of the central valley bottom wetland system, is supported, mainly because the water flowing from the wetland system to the Jan Dissels River is expected to be of better quality with formalized stormwater treatment than it is at present. This depends on the stormwater from both the new development and the existing settlement being treated before it enters the wetland, on peak flows being attenuated to pre-development levels, on outlets and ponds being placed outside the wetland and discharging diffusely, and on the system being maintained and the Wetland Rehabilitation and Management Plan being implemented.

The refurbishment and upgrade of the WWTW aim to treat the effluent to the Special Limit Values. They are expected to improve the quality of treated effluent reaching the Jan Dissels River compared with the long record of non-compliance at the works, and are supported and encouraged. Without mitigation, the effluent quality impact of the expanded works is of High significance. However, given the history of non-compliance, and because the additional capacity will need additional operational support, the impact of effluent quality to the Jan Dissels River remains of Medium significance after mitigation. Compliance must be secured through a specialist process engineer, a dedicated works manager and regular effluent monitoring. The increased discharge will also alter the flow in the river from the current status quo. This reach of the Jan Dissels River is already affected by the abstraction of potable water for the town upstream of the effluent release, and its floodplain downstream of the abstraction point has dried out, and the growth of the town that the expansion provides for over the next 15 years is likely to require additional abstraction. Downstream of the works the river is not natural: it flows past the town and through farmland for about 4.7 km before joining the Olifants River. These factors moderate the significance of the change in flow. The Olifants River, which the Jan Dissels joins about 4.7 km downstream of the release, is regulated by Clanwilliam Dam and is unlikely to be measurably affected in flow, although some water quality impairment is possible.

Two separate quantities need to be considered: the treated effluent generated by the housing development itself, estimated at about 640 m³/day, and the full 1.5 Ml/day expansion of the works, which provides for the growth of the town. These are assessed separately as Impacts 8a and 8b. After mitigation, the housing development's share is of Low significance, because it is small, only part of it is likely to reach the river while effluent continues to be reused for irrigation, and the lower river is already affected by abstraction. The full expansion remains of Medium significance on a precautionary basis, because it is larger and increases progressively, and without a water balance and current flow data the proportion reaching the river cannot be reliably quantified. Given the extent of abstraction, the additional discharge could be seen as partly offsetting the existing dry-season flow deficit in the lower Jan Dissels River (Van der Berg, 2008), but this cannot be confirmed without current flow and abstraction data, and the quality of that water remains the main concern. The southern seep, which has received effluent for many years, is likely to expand as the volume increases, but this is of Low significance, given the degree of disturbance it already exhibits (hydrology and water quality critically modified, PES E). A water balance would show how much of each reaches the river, but it was not available for this assessment, so the change in flow has been assessed using a conservative upper-bound scenario. If DWS require a

hydrological assessment for the expansion of the WWTW, this report may need to be updated.

It is the opinion of the specialist that the proposed Clanwilliam Housing Development, including its stormwater infrastructure and the associated refurbishment and expansion of the Clanwilliam WWTW, is acceptable from an aquatic biodiversity perspective and may be authorised. This is on condition that the mitigation measures in Section 6 are implemented and that the upgraded WWTW consistently meets the Special Limit Values for discharge to the Jan Dissels River.

The development will formalise housing for residents of the existing informal settlement, whose untreated stormwater, waste and possibly sewage currently drain into the central valley-bottom wetland system and on to the Jan Dissels River. Formal services, the treatment of stormwater from both the new development and the existing settlement, and the rehabilitation of the wetland offer a real opportunity to improve the condition of the wetland and the quality of water reaching the river. The refurbishment and upgrade of the WWTW, which has a long record of non-compliance, is likewise necessary, and is expected to improve the quality of the effluent reaching the Jan Dissels River compared with the status quo. Neither benefit is assured, however. The quality of treated effluent reaching the Jan Dissels River and the change in flow from the full expansion of the works remain of Medium significance after mitigation, and the river downstream of the works is already strongly influenced by effluent. Careful implementation of the recommended mitigation, monitoring and oversight is therefore essential. The following should be conditions of the environmental authorisation and the water use licence:

- The upgraded WWTW must be operated to meet the Special Limit Values (GN 665 of 2013) for discharge to the Jan Dissels River, and the refurbished works must be shown to meet them before the new module is commissioned.
- A suitably qualified wastewater process engineer must oversee the commissioning of the works and audit its performance, a dedicated works manager must be appointed, and staff, maintenance and funding must be increased in line with the additional capacity.
- A full WULA must be submitted for the section 21 (c) and 21 (i) water uses, together with the section 21 (e) and 21 (f) uses, and must include a monthly water balance for the works (inflow, irrigation and discharge to the river).
- The stormwater system must attenuate post-development peak flows to pre-development levels, treat stormwater from both the new development and the existing informal settlement before it enters the wetland, and place outlets and any new ponds outside the wetland where possible, with a settling pond or forebay before the discharge into the wetland at Pond 7, energy dissipation and diffuse discharge.
- The Wetland Rehabilitation and Management Plan (Delta Ecology, 2026) must be implemented for the central valley-bottom wetland system, to achieve its REC of D, and the reed bed of the southern seep must be retained as a polishing wetland.
- An irrigation management plan must be prepared for the golf course.
- Before construction starts, a suitably qualified aquatic specialist and the appointed engineers must prepare a comprehensive monitoring plan, covering effluent quality and volumes, water quality upstream and downstream of the works and in the

Olifants River, SASS5 and fish, and the extent of the southern seep. SASS5 and fish baseline surveys must be completed before construction. Monitoring results must be reported to DWS and the municipality.
- An Environmental Control Officer must oversee construction and compliance with the EMPr.

If post-refurbishment effluent results, the water balance or a hydrological assessment required by DWS show conditions materially different from those assumed in this addendum, the assessment should be reviewed.

Animal Species

CONCLUSION AND RECOMMENDATIONS

The sampling and analysis of the site during the optimum season and year, provides suitable data and results to present an informed decision on the local animal species. The lists of species for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach. During the site visit, the different biodiversity features, habitat, vegetation, and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and species observed were recorded. Searches for listed species of conservation concern at the site were conducted. Extensive habitat is however available for them to utilize outside the proposed vegetation clear area. There are wetlands east of the site associated to the Jan Dissels River and significant undisturbed indigenous vegetation in good quality to the south of the site and town and east towards the Jan Dissels river and beyond that the Cederberge. The presence of sensitive habitats such as wetlands or pans and unique edaphic environments, such as rocky outcrops or quartz patches, such as SCC habitats are present and therefore was recorded and mapped.
The study recorded medium and low sensitivity areas within the study area. The development of the site would have a **Medium Negative** impact on animal species. The proposed clearing will have relatively little animal species impacts provided that appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to.

No additional survey or further assessment is in the authors view recommended. Provided that activities are restricted to the property and the mitigation measures to reduce the impacts of the activities are implemented, then the activities are not likely to result in long-term degradation of the receiving environment or significant net loss of SCC animal species.

Heritage Impact Assessment

CONCLUSION
The broader Cederberg area is renowned for its rock art and significant associated archaeology. Clanwilliam and its access via the Botterkloof Pass road act as a gateway from the N7 into the rest of the Cederberg area. Clanwilliam retains a number of historic farmsteads in the area, as well as excellent examples of vernacular architecture and Provincial Heritage Sites all oriented along the structuring elements of Hoof Street, Park Street and Ou Kaapse Road. As noted above, Clanwilliam suffered when the community of Sederville was moved and their houses demolished and as a result, very little historic fabric remains within the Sederville area.

The proposed development site is predominantly underlain by the Nardouw Subgroup,

specifically the Rietvlei Formation. Both the Nardouw Subgroup and the Rietvlei Formation are characterised by low palaeontological sensitivity, as they generally do not contain fossils of significant scientific or heritage value. This conclusion aligns with previous studies, which have consistently indicated that these formations are not typically rich in palaeontological resources. The potential impact of the proposed development on palaeontological resources is assessed as minimal, with a low likelihood of encountering any significant fossil material during construction. Additionally, the Goudini, Skurweberg, and Rietvlei Formations, which are also present in the broader area, share similarly low palaeontological sensitivity. As a result, no specific mitigation measures are required for the proposed residential development. While no specific mitigation strategies are required, it is recommended that the Chance Fossil Finds Procedure be implemented during the construction phase. This protocol will ensure that any unexpected fossil discoveries are promptly reported and appropriately managed, safeguarding potential heritage resources. As noted above, the archaeology field assessment did not identify any visible evidence of the supply depot and field hospital located on the Clanwilliam commonage from the South African War mentioned above, although buried evidence of this infrastructure may be present beneath the ground surface. This development activity comprises infill development within the existing urban edge of Clanwilliam. The area proposed for development is located between two areas that have been identified as having historic value and are proposed as <Heritage Zones= (Park Street precinct - Zone E - and Sederville precinct - Zone G) in the Clanwilliam SDF (2023, Figure 7). In order to ensure that the proposed development fits into this infill space, the following recommendations are proposed:

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space
- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Larger erven are positioned in the space between Zone G and Zone E
- Architectural guidelines are developed for the area between Zone G and Zone E
- Adherence to the historic grid alignment oriented around Park Street, Hoof Street and Ou Kaapse Road
- Sufficient breathing space and appropriate hierarchies in response to the significant heritage resources identified. In order to ensure that no impact to heritage resources occurs during the construction or operational phases of the development, recommendations are made below.

8. RECOMMENDATIONS

There is no objection to the proposed development from a heritage perspective on condition that:

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order to retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space. This would require the reallocation of approximately 50 GAP housing erven.
- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Due to the position of the proposed development between two areas that have been identified as having heritage value, additional design detail be submitted to HWC for approval as a condition of a positive comment on this HIA. The architecture of the proposed development should adhere to the Guidelines included as Appendix 3.
- The attached Chance Fossil Finds Procedure is implemented for the duration of construction activities

- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.

Traffic Impact Assessment

CONCLUSIONS

The following can be concluded/summarised from the report:

33. This TIS accompanies the Application for Rezoning and Subdivision of Erf RE279, Clanwilliam.
34. The proposed development areas constitute Clanwilliam's Integrated Residential Development Programme (IRDP) and Upgrading of Informal Settlements Programme (UISP).
35. The total proposed subdivision includes 160x Residential Zone 1 erven, 1 155x Residential Zone 2 erven, 5x Community Zone 1 erven (1x Community Centre – 800 seats, 3x Crèche – 140 students, and 1x School – 500 students), 7x Community Zone 2 erven (Churches – 830 seats), 1x Community Zone 3 erf (Clinic – 443.4 m^2 GLA), 4x Local Business Zone 2 erven (± 3 026 m^2 GLA) and 1x Authority & Utility Zone erf (Police Station – ± 772.2 m^2 GLA).
36. The subject development areas are currently accessible via the residential streets leading to/from Ou Kaapse Way. Several additional and/or upgraded access points from/to the existing public road network are proposed for the future.
37. Traffic counts were conducted at 9 intersections in the vicinity of the proposed development areas on Thursday, 14 March 2024 during the AM (06:00 to 09:00) and PM (15:30 to 18:30) peak periods.
38. The proposed development has the potential to generate 523 AM peak hour trips (193 in, 330 out) and 471 PM peak hour trips (289 in, 182 out). These trips were distributed to/from the main streets intersecting Ou Kaapse Way.
39. Traffic analyses were performed for the most traversed sections of Graafwater Way, Main Road and Ou Kaapse Way as well as the three intersections with the highest total expected 2029 peak hour traffic volumes (Graafwater Way/Main Road, Ou Kaapse Way/Voortrekker Street/Denne Street, and Ou Kaapse Way/De Villiers Street/Bloekom Street). No upgrades are considered necessary to accommodate the total expected 2029 peak hour traffic. Nonetheless, mention is made of the potential benefits of the planned bypass road from the entrance of the town (Graafwater Way) to the industrial area (i.e. bypassing Main Road and most of the northern section of Ou Kaapse Way), which was identified as a need in the Cederberg Municipality Local Integrated Transport Plan 2020 – 2025.
40. For the new proposed local streets in the development areas, a road reserve of 10 m (typical for Class 5B local residential streets) is proposed for the residential areas, while 16 m (typical for Class 5B local commercial streets with on-street parking) is proposed for the main roads in Development Area 1 and Development Area 3.
41. The development areas' new/upgraded intersections are to be sign-controlled (i.e. stop or yield).
42. Further elements of the new streets, such as cross sections, right of way, kerb radii and sight distances are expected to be specified in the final road designs and will require separate assessment and approval based on the applicable standards.
43. Based on the information received, refuse removal will be carried out by the municipality via kerbside collection, as is current practice in the surrounding area.
44. The future parking layouts are expected to be addressed during each erf's building plan
45. application process and should comply with the requirements set out in the latest.
46. Due to its unpractical location, Clanwilliam's existing formal minibus taxi rank (situated on the corner of Mark Street and Visser Street) is not in use at present. Instead, minibus taxis operate from the front of Spar on Main Road. The relocation of Clanwilliam's rank has been

identified as a prioritised project in the municipality's transport plan, and a new site has been proposed along the eastern side of Ou Kaapse Way opposite Rooitee Street. Appropriate taxi/bus stops and turning facilities need to be provided where applicable.

47. Sidewalks of at least 1.5 m should be provided inside the road reserves of the new main streets to tie in with the existing and planned pedestrian facilities and/or routes.
48. Further formal public- or non-motorised transport facilities are not deemed necessary for the proposed development areas.

RECOMMENDATIONS

From the discussions provided in this report, it is recommended that the proposed development (Clanwilliam IRDP and UISP), indicated on the attached Subdivision Plan, be supported from a traffic impact perspective.

We trust that the Traffic Impact Assessment will be to your satisfaction and will gladly provide any additional information required on request.

SECTION 8: SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT AND STATEMENT

Impact Summary Construction phase:

Soil erosion and dust - (Medium impact before mitigation and low impact with mitigation measures);

Impact of construction activities on surface and underground water pollution - (High impact before mitigation and low impact with mitigation measures);

Impact of construction activities on surface and underground water pollution - (Medium impact before mitigation and low impact with mitigation measures);

Construction activities can affect the underlying geological layers on site to some extent pollution - (Low impact before mitigation and low impact with mitigation measures);

Increased jobs - (No impact before mitigation and positive impact with mitigation measures);

Increased traffic due to the construction activities requiring various vehicles to come onto and leave the site - (Low impact before mitigation and low impact with mitigation measures);

Waste Impacts - (Low impact before mitigation and low impact with mitigation measures);

Noise due to construction machinery - (Low impact before mitigation and low impact with mitigation measures);

Animal Species Impacts - (High impact before mitigation and low impact with mitigation measures);

Terrestrial Biodiversity Impacts - (Medium impact before mitigation and low impact with mitigation measures);

Aquatic Biodiversity Impacts - (High impact before mitigation and low impact with mitigation measures);

Operational phase:

Soil erosion and dust - (Low impact before mitigation and low impact with mitigation measures);

Increased jobs - (No impact before mitigation and positive impact with mitigation

measures);
Aquatic Biodiversity Impacts - (Medium impact before mitigation and low impact with mitigation measures);

Decommissioning phase:
Similar to impacts associated with construction phase.

No Go or No Development option:
The No-Go option will result in the site remaining as is presently. Negatively effecting freshwater ecology and water users downstream as a result of poor quality treated effluent released. The central valley bottom wetland would remain unrehabilitated and would continue to receive unmanaged stormwater from the informal settlement and township, and the existing WWTW, which has a long record of non-compliant effluent, would continue to operate close to its capacity as the town grows. This is a continuing negative impact of Medium significance on the wetland and the Jan Dissels River.

Environmental Statement:

Layout alternative is currently the preferred layout alternative, because it incorporates all specialist and engineer recommendations as well as Heritage Western Cape conditions and is located within the urban edge – aligned with municipal IDP and SDF. The proposed area as per the site development plan will have relatively little terrestrial biodiversity and ecological impact on sensitivity areas and the surrounding terrestrial biodiversity features provided that the development stays within the site development plan area and appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to.

Provided that activities are restricted to the property and the mitigation measures to reduce the impacts of the activities are implemented, then the activities are not likely to result in long-term degradation of the receiving environment or significant net loss of SCC plant species.

The proposed development is conditionally supported at the level of masterplan and development framework, provided that the various mitigation measures and recommendations are successfully implemented.

Based on this analysis, the preferred masterplan layout is broadly supported from a heritage perspective.

Refer to Appendices B for maps of the proposed location and preferred layout.

SECTION 9: RECOMMENDED CONDITIONS TO BE INCLUDED AS CONDITIONS OF THE AUTHORISATION, ASSUMPTIONS AND LIMITATIONS

9.1 DESCRIBE THE ABILITY OF THE APPLICANT TO IMPLEMENT THE MANAGEMENT, MITIGATION AND MONITORING MEASURES

The applicant is ultimately responsible for the implementation of the EA and EMP and the financial cost related thereto. In accordance with the requirements of the EA and EMP, the

applicant must ensure that any person acting on their behalf complies with the conditions / specifications contained in this EA, EMP and any other relevant permits/licences/legislation etc. related to the activities. In addition, an Environmental Control Officer must be appointed to review, monitor and report on compliance with the relevant requirements. Thus, if the applicant intends to commence with the proposed and authorised activities he/she must ensure that he/she is able to implement the required management, mitigation and monitoring measures throughout the lifespan of the project.
Additional design detail be submitted to HWC for approval as a condition of a positive comment on this HIA. The architecture of the proposed development should adhere to the Guidelines has yet to be met and the design detail must be submitted to HWC.
The key conditions are compliance with the Special Limit Values under specialist oversight, a full WULA with a water balance for the works, attenuation and treatment of stormwater, implementation of the Wetland Rehabilitation and Management Plan, an irrigation management plan for the golf course, and a monitoring plan, with SASS5 and fish baseline surveys before construction.

9.2 PROVIDE THE DETAILS OF ANY FINANCIAL PROVISIONS FOR THE MANAGEMENT OF NEGATIVE ENVIRONMENTAL IMPACTS, REHABILITATION AND CLOSURE OF THE PROPOSED DEVELOPMENT

Unknown at this stage. Mitigation for negative environmental impacts, rehabilitation and closure requirements will be determined throughout the lifespan of the proposed development depending on whether or not and what will be required. The holder of the authorisation is however ultimately responsible to ensure that any required mitigation and rehabilitation measures are implemented which may be required due to the proposed development.

9.3 DESCRIBE ANY ASSUMPTIONS, LIMITATIONS, UNCERTAINTIES, DEVIATIONS AND GAPS IN KNOWLEDGE WHICH RELATE TO THE ASSESMMENT AND IMPACT MANAGEMENT, MITIGATION AND MONITORING MEASURES PROPOSED

EAP is only knowledgeable about the potential environmental and ecosystems aspects as assessed in this report.

In undertaking this investigation and compiling the Scoping Report and EIR, the following were assumed:

- The information provided by the client, engineers and specialists is accurate and unbiased;
- The scope of this investigation is to assess the direct and cumulative environmental impacts associated with the development; and
- Should the proposed project be authorised, the applicant will incorporate the recommendations and mitigation measures outlined in the EIR, the EMP and the EA into the detailed design and construction contract specifications and operational management system for the proposed project.

The EAP is not aware of any deviations from the approved scoping report at this stage.

9.4 RECOMMENDATIONS OF THE EAP AND SPECIALISTS

(a) In my view as the appointed EAP, the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the listed activity(ies) applied for. Provide reasons for your opinion	YES	~~NO~~
The Draft EIA report must still be submitted to all registered I&APs and key departments for comments before all relevant comments can be obtained and addressed for the decision-making authority to take into consideration during the final decision-making process.		
(b) If the documentation attached hereto is sufficient to make a decision, please indicate below		

whether, in your opinion, the listed activity(ies) should or should not be authorised:		
Listed activity(ies) should be authorised:	YES	~~NO~~
Provide reasons for your opinion		
Layout alternative is currently the preferred layout alternative, because it incorporates all specialist and engineer recommendations as well as Heritage Western Cape conditions and is located within the urban edge – aligned with municipal IDP and SDF. The proposed area as per the site development plan will have relatively little terrestrial biodiversity and ecological impact on sensitivity areas and the surrounding terrestrial biodiversity features provided that the development stays within the site development plan area and appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to. Provided that activities are restricted to the property and the mitigation measures to reduce the impacts of the activities are implemented, then the activities are not likely to result in long-term degradation of the receiving environment or significant net loss of SCC plant species. The proposed development is conditionally supported at the level of masterplan and development framework, provided that the various mitigation measures and recommendations are successfully implemented. Based on this analysis, the preferred masterplan layout is broadly supported from a heritage perspective. Refer to Appendices B for maps of the proposed location and preferred layout. The central valley bottom wetland would remain unrehabilitated and would continue to receive unmanaged stormwater from the informal settlement and township, and the existing WWTW, which has a long record of non-compliant effluent, would continue to operate close to its capacity as the town grows. This is a continuing negative impact of Medium significance on the wetland and the Jan Dissels River.		
(c) Provide a description of any aspects that were conditional to the findings of the assessment by the EAP and Specialists which are to be included as conditions of authorisation.		
It is recommended that the following recommendations be included as conditions of the authorisation: • All specialists' recommendations must be adhered to during all phases of the proposed project. • Demarcate no-go areas before any land clearing occurs under the supervision of an ECO. Demarcation must be clearly visible and effective and no-go area must remain demarcated throughout construction phase. • Undertake all construction, operational and decommissioning activities as according to the requirement of the Environmental Management Programme.		
(d) Please indicate the recommended periods in terms of the following periods that should be specified in the environmental authorisation:		
i. the period within which commencement must occur;	Within 5 years of obtaining Environmental Authorisation	
ii. the period for which the environmental authorisation is granted and the date on which the development proposal will have been concluded, where the environmental authorisation does not include operational aspects;	Ongoing maintenance of infrastructure and implementation of EMP until decommissioning.	
iii. the period for which the portion of the environmental authorisation that deals with	Within 10 years of obtaining Environmental Authorisation	

non-operational aspects is granted; and	
iv. the period for which the portion of the environmental authorisation that deals with operational aspects is granted.	Ongoing maintenance of infrastructure and implementation of EMP until decommissioning.

SECTION 10: APPENDICES

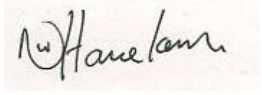
APPENDIX		Confirm that Appendix is attached
Appendix A:	Locality map	Y
Appendix B:	Site development plan(s)	Y
	A map of appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffer areas;	Y
Appendix C:	Photographs	Y
Appendix D:	Public Participation Process	Y
Appendix E:	Specialist Reports	Y
Appendix F:	Environmental Management Programme Wetland Rehabilitation Management Plan	Y
Appendix G:	Services Confirmation and Engineer Reports	Y
Appendix H:	Rezoning motivation report Environmental Screen Tool report Heritage Western Cape RoD Stormwater management layout Proof of Water Use License application commencement WC Department of Infrastructure Management Comment on roads	Y

SECTION 11: DECLARATIONS

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I **Nicolaas Willem Hanekom**, EAPASA Registration number **2020/1146** as the appointed EAP hereby declare/affirm the correctness of the:

- Information provided in this EIR and any other documents/reports submitted in support of this EIR;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
- In terms of the remainder of the general requirements for an EAP, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- I have disclosed, to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Competent Authority or the objectivity of any report, plan or document prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;



28 October 2026

Signature of the EAP: Date:

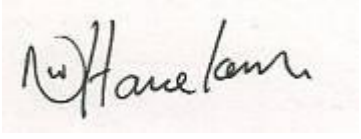
Enviro-EAP (Pty) Ltd

Name of company (if applicable):

DECLARATION OF THE SPECIALIST

I **Nicolaas Willem Hanekom**, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

- In terms of the general requirement to be independent:
    - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.



Nicolaas Hanekom
Pri.Sci.Nat (Ecology) 004415 **28 October 2026**
Signature of the Specialist: Date:

Enviro-EAP (Pty) Ltd
Name of company (if applicable):