ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

DEA&DP REF. NO: 16/3/3/1/B2/32/1083/25

THE PROPOSED DEVELOPMENT OF A FREE-RANGE POULTRY BROILER FACILITY ON THE REMAINDER OF FARM NUMBER 563, 564, 565 AND THE FARM KLEINFONTEIN NUMBER 954, WORCESTER, WESTERN CAPE.

OCTOBER 2025

cell: 082 566 1660| tel: (028) 312 1734 | fax: 086 508 3249 | jt@phsconsulting.co.za
P.O Box 1752 | Hermanus | 7200

EMPr DETAILS:

APPLICANT:

NAME: EFRC Agri Operations (Pty) Ltd
CONTACT PERSON: Jaco Viljoen
ADDRESS: PO Box 1176
GRABOUW
7160
CELL: 071 687 2246
EMAIL: jacov@efrc.co.za

AUTHOR:

COMPANY: PHS Consulting
CONSULTANT: Paul Slabbert/ Jenna Theron
CELL: 082 566 1660 / **TEL:** (028) 312 1734 / **FAX:** 086 508 3249
EMAIL: jt@phsconsulting.co.za
POSTAL: P.O Box 1752, Hermanus, 7200

EXPERTISE: PAUL SLABBERT (Managing Member) graduated from the Potchefstroom University in 1995 with an honours degree B Art Et Scien. His passion for environmental, heritage & land-use planning with knowledge of associated management strategies enables him to facilitate all role players and to implement workable policies. His experience in rural and urban conservation with the emphasis on environmental impact and management, focusing on sustainable development, enabled him to have various publications. He has hands-on expertise in heritage, conservation and recreation discipline with the emphasis on creating economic and employment opportunities. With sufficient practical experience in terms of the criteria of the Interim Certificate Board for Environmental Assessment Practitioners of South Africa (EAPASA) for registration, Paul was registered as an Environmental Assessment Practitioner. He is also a member of the International Association for Impact Assessment (IAIA), Corporate Member of the South African Planning Institute (SAPI) and accredited with the Association of Professional Heritage Practitioners – Western Cape (APHP).

EXPERTISE: JENNA THERON (Senior EAP) graduated from Stellenbosch University with a Bachelor's Degree in International Studies (2005) and a Master's Degree in Cultural Tourism and Heritage Studies (2007). Jenna has experience in the field of environmental and heritage planning since interning for the CoCT's Environmental and Heritage Department in 2008 and thereafter working as an Environmental Assessment Practitioner since 2009 to the present. With sufficient practical experience in terms of the criteria of the Interim Certificate Board for Environmental Assessment Practitioners of South Africa (EAPASA) for registration, Jenna was registered as an Environmental Assessment Practitioner. She is also a member of the International Association for Impact Assessment (IAIA) and an accredited Associate member with the Association of Professional Heritage Practitioners – Western Cape (APHP).

PAUL SLABBERT

JENNA THERON

Please refer to our CVs included in **Annexure 1**.

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Additional information included highlighted in blue underlined.

SECTION 1: INTRODUCTION & OVERVIEW

1.1 BACKGROUND:

An Environmental Management Plan (EMPr) describes mitigation measures in detail, and is prescriptive, identifying specific individuals or organizations responsible for undertaking specific tasks to ensure that impacts on the environment are minimized during construction, operational and related activities. As an open – ended document, information gained during on-going monitoring of procedures on site could lead to changes in the recommendations and specifications of this document. This document forms an agreement between the Department of Environmental Affairs and Development Planning (DEA&DP) and the Applicant that the environmentally sensitive features on the site will be suitably protected during the lifespan of the activity through the implementation of the applicable mitigation measures.

This document is intended to guide and manage the construction, operation and maintenance phase of the proposed development of a free-range poultry broiler facility on the Remainder of Farm 563, 564, 565 and the Farm Kleinfontein Number 954, Worcester, Western Cape (Breede Valley Local Municipality). Collectively the four farm portions are approximately 987 ha in extent and are located approximately 30 kilometers south of Worcester and approximately 13 kilometers north of Villiersdorp with access being obtained via a gravel road off the R43. The property is zoned Agriculture Zone 1. Please refer to **Annexure 2: Locality Maps**.

1.2 ENVIRONMENTAL ATTRIBUTES:

1.2.1 Vegetation

Vegetation associated with the project site is largely classified as the Endangered Breede Shale Renosterveld (FRs8), represented by the blue area in Figure 1. Smaller patches of North Sonderend Sandstone Fynbos (purple area) and Robertson Karoo (yellow area) are also present.

The vegetation and landscape features generally associated with this type include low hills, slightly undulating to undulating plains, and lower mountain slopes. In the eastern regions, open, tall shrublands—possibly closely affiliated with FRs12 Central Rûens Shale Renosterveld—are found, where microphyllous shrubs form the dominant layer. Breede Shale Renosterveld transitions into Robertson Karoo in the central valley. Karoo shrublands typically occur on the northern aspects, while renosterveld is found on the southern aspects, with a decline in karoo shrubland extent to the south. Heuweltjies (mound-like features) are prominent, often supporting bush clumps in moister areas and succulent shrubs in drier habitats.

However, the proposed activities are largely taking place within fallow agricultural fields or within the farm werf. Considering the agricultural nature of the development, its location within agricultural fields and within the existing farmyard very little indigenous vegetation will be disturbed. However, certain freshwater crossings do constitute intact areas of indigenous vegetation.

Vegetation found within the affected freshwater features ranged from being in a largely natural state to being largely to seriously modified condition at places. Terrestrial riparian vegetation generally found within the healthier riparian areas included: Sandolien (*Dodonaea viscosa var. angustifolia*), Taaibos (*Rhus undulata*), Bittergombos (*Lycium ferocissimum*), Kraalbos (*Aizoon africanum L.*), Renosterbos (*Elytropappus rhinocerotis*), *Pteronia sp.* and Cotton Milkweed (*Gomphocarpus fruticosus*). Vegetation marking wetter areas included *Ischyrolepis gaudichaudiana, Platycaulos major, Cyperus congestus, Merxmuellera stricta, Juncus sp.* and the common reed (*Phragmites australis*).

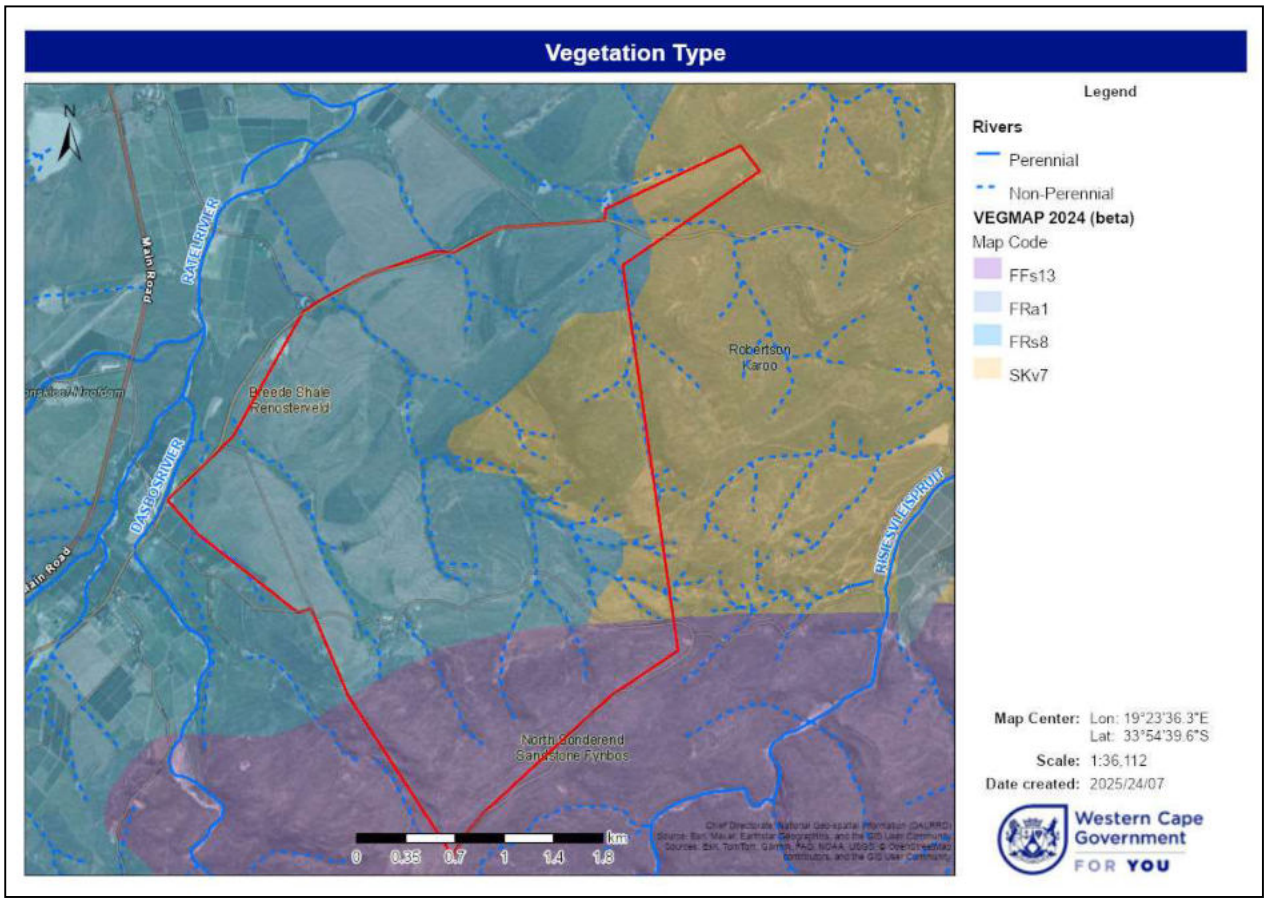


Figure 1: National Vegetation Map represented within the property boundaries of the site (red polygon) (CFM, 2025).

1.2.2 Faunal & Avifaunal:

The proposed activities are largely taking place within fallow agricultural fields, as confirmed by a site visit and aerial imagery. Considering the agricultural nature of the development, its location within agricultural fields and within the existing farmyard it is thus improbable that the faunal species listed would be present within the development site and the Animal Species Sensitivity of the site is considered LOW.

No aquatic-dependent fauna of special concern was observed during the field survey; however, several bird species were noted in the wetter areas. As the site borders a protected area to the southeast, the stream corridors are also expected to serve as migration routes for surrounding wildlife.

1.2.3 Freshwater:

Freshwater features found within the project site included several small seasonal tributaries of the Ratel River with their associated wet areas. The freshwater features on site are referred to as Streams A to D (shown in Figure 2). All four streams are primarily seasonal, with permanently wet areas observed along their channels, suggesting a degree of groundwater contribution to baseflow. They originate in the hills to the southeast and flow generally in a north-northwestern direction, where Streams A and B, and Streams C and D converge, respectively, before joining the Ratel River.

The upper reaches of these streams remain largely in a natural state; however, their condition deteriorates to varying degrees (moderately to seriously modified) upon entering farmed areas. In these sections, several historic impacts have been observed, including vegetation removal, agricultural encroachment into riparian zones, the construction of instream dams, and artificial canalisation, particularly in Streams A and B. Both converged stream systems terminate in large farm dams shortly before reaching the Ratel River.

A large portion of the Streams A and B system likely historically comprised an unchanneled valley-bottom wetland. However, this area has been so extensively modified that it has lost all ecological function. Only a small remnant of the wetland remains at the confluence of the two streams. In contrast, Streams C and D have been the least impacted, with large sections still ranging from largely natural to moderately modified in condition.

Due to their similar condition and geomorphological characteristics, as well as the fact that they form two distinct tributaries, Streams A and B were assessed as a single unit, as were Streams C and D. Please refer to Table 1 below for a summary of the River Assessment for the unnamed tributaries.

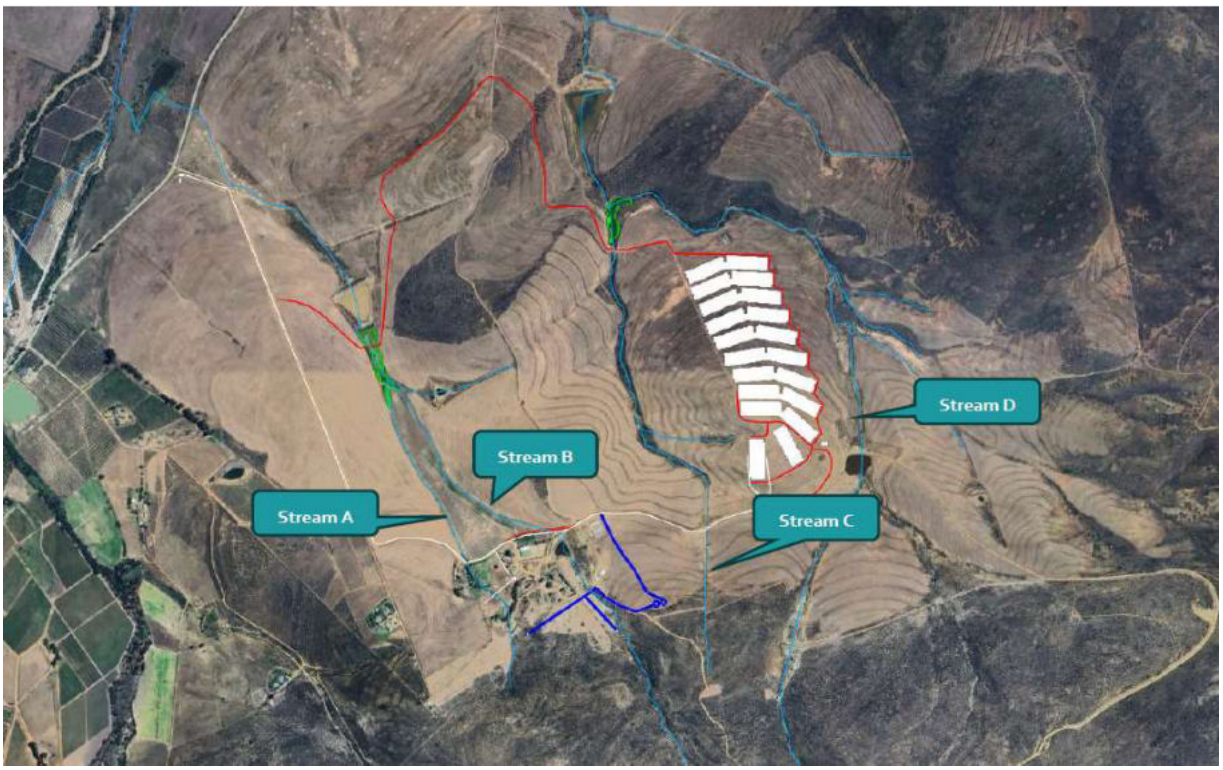


Figure 2: Satellite imagery indicating the project site with the proposed new roads (red lines), the broiler area (white polygons) as well as the affected streams (blue lines) with their associated wetland areas (green polygons). Dark blue line showing water pipelines between boreholes and reservoirs.

Table 1: Summary of the River Assessment for the unnamed tributaries.

	Stream A and B	Streams D and E
DWA catchment	H40F	
Vegetation type	Breede Shale Renosterveld (Critically Endangered)	
Rainfall region	Winter	
System	Inland System	
Regional Setting	Western Folded Mountains	
Landscape unit	Slope to Valley Floor	
Hydrogeomorphic Unit	Stream (Seasonal)	
Longitudinal zonation/Landform/ Outflow drainage	Foothill - Sand Bed	
Landform/Inflow drainage	Active Channel	
Substratum type	Loam and Clay	
Special conservational features (from desktop study)	WCSBP (2017)	Based on the 2023 WCBSP map (Figure 6), terrestrial Critical Biodiversity Areas (CBA's) were found around the remaining natural areas on the property Furthermore, aquatic Ecological Support Areas (ESA1: Ground Water Source) were also indicated specifically towards the south and east of the property.

1.2.4 Heritage:

A Heritage Screener was completed for input at an early stage. The screener confirmed that it is unlikely that significant heritage resources will be negatively impacted by the proposed development and as such, no further heritage studies were recommended. HWC confirmed that no Heritage resources are likely to occur on site and that no further studies will be required (**Annexure 7**).

1.2.5 Geohydrological:

Four boreholes have been drilled on the property, however, only two boreholes are viable for abstraction. The boreholes revealed that the area hosts a "fractured" aquifer, which is made up of sandstone, mudstone and shale of the Gydo Formation (Bokkeveld Group) underlain by mudstone, sandstone, shale, and siltstone from the Rietvlei Formation (Table Mountain Group). The regional maps indicate yields of > 5 0 L/s in the study area. Regarding quality, the area is characterized by an electrical conductivity that ranged between 0-300 mS/m.

The four production boreholes that have been drilled are KF_BH1, KF_BH2, KF_BH3, and FK_BH4 however, KF_BH3 and KF_BH4, did not yield enough water to conclude yield testing. KF_BH1 and KF_BH2 have been correctly yield tested (according to SANS 10299 4-2003). The results have been used to determine the sustainable (i.e., long-term and safe) yield of the boreholes. The sustainable yield of the boreholes is within the indicated regional yields of the aquifer. KF_BH1 yields 3.7 L/s, while KF_BH2 yields 1.2 L/s. The proposed sustainable volume that can be abstracted from the drilled boreholes is 154 526 m^3/a. The groundwater quality, specifically EC, is measured at 40.8mS/m for KF_BH1 and 34 mS/m for KF_BH2. Trace metal concentrations, however, are high and water would need to be treated.

The boreholes have been correctly tested and if the boreholes are pumped (according to the guidelines), a volume of 154 526 m^3/a can be abstracted. This volume requested is 68% less than what the boreholes can deliver. If groundwater abstraction stays within these volumes, sustainable abstraction is possible.

1.3 ACTIVITY DESCRIPTION:

Elgin Free Range Chickens (EFRC Agri Operations (Pty) Ltd.) propose the development of a Free-Range Poultry Broiler Facility. The Broiler Facility will involve the establishment of 20 Broiler Houses (approx. 1044m^2 per facility). Each facility will house approximately 17 000 birds. An Ablution facility, Guard House, Spray Race and Refrigerated Container will be located at the entrance to the site. Furthermore, an additional Ablution Facility and Residential Dwelling will be located at the broiler facilities. Refer to **Figure 3** below.

An existing access road will be utilised and numerous internal roads (6m width required) will be upgraded and realigned where applicable for biosecurity reasons, to improve traffic flow and safety, and to improve river crossings. Four watercourse crossings are required, two are existing crossings and two are new crossings within the proposed road alignment. Three of the structures proposed will be low waterway bridges and one will be a suspended bridge structure.

Low Water Bridges: Low waterway bridges are reinforced concrete structures with a driving surface (final top level) raised above ground (natural ground level) and these structures cross waterways nearly perpendicular to the natural water flow direction of the stream. Pipes will be installed at set intervals across the bridge length to allow water to freely pass through.

The final top level of the bridge is horizontal (level) and extends across the total width of the existing stream. Where the horizontal bridge section ends at the edge of the stream a further concrete slab on both ends extends at an incline (approach ramps) to a level 1m above natural ground level. This is to mitigate vehicle approach at a slope towards the bridge.

Bridge foundations are concrete walls with footings varying between 1,0 to 1,5m deep below natural ground level or until suitable founding material is found. G5 type materials will be used to fill the void between foundations walls to support the concrete slab (driving surface). However, where suitable founding materials is reached less than 1.0m deep below natural ground level, foundation walls are not required, and G5 type fill material is adequate.

A combination of Gabion baskets, blankets and biddim material will be used to prevent erosion directly up and downstream from the bridge. These erosion prevention measures will continue along the total length of the bridge structure, including the approach ramps on either side. Along the upstream side of the bridge the top of the gabion baskets will be level with the invert level of the pipes going through the concrete. On the downstream side the top of the gabion baskets will be flush with the top of the driving surface.
Protruding concrete blocks will be placed at intervals on top of the driving surface along the edge of the road to indicate the side of the road during flood conditions. The height of the blocks will indicate if the water level is suitable for safe vehicle crossing.

Suspended bridge structure: Where the natural runoff channel is deep and narrow) a suspended bridge will span across. Suspended bridges are reinforced concrete structures with a driving surface (final top level) raised above ground (natural ground level). The structure crosses the waterway at a skew angle to align with the approach roadway alignment. The final top level of the bridge is horizontal (level) and has upstand beams on both sides. Where the horizontal bridge section ends at the edge of the stream a further concrete slab on both ends extends at an incline (approach ramps) to natural ground level. This is to mitigate vehicle approach at a slope towards the bridge. There are 3 walls supporting the bridge, 2 on both sides of the stream and one in the centre.

Bridge support walls (3 in total) are reinforced concrete which is founded on rock. The foundations are sunk 300mm deep into the rock and water will flow in between the supporting walls. The flow area through bridge support walls is more than the width of the existing natural channel hence no channelling of the stream occurs. Gabion structures both at the upstream and downstream side of the supporting walls will protect the structure against erosion.

As there is not enough space at the suspended bridge to divert stream flow to accommodate wet works, a temporary upstream coffer dam must be constructed to temporarily divert stream water away from the wet works during construction.

Electrical: The Electrical Network Service Provider (NSP) for the site is Eskom. The site is being fed from the Haamanshof-Farmers 3 11kV overhead line (OHL) feeder which is then stepped down to the 400V voltage level via a 100kVA distribution transformer. As the electrical network of Eskom currently has insufficient capacity to supply the entire project with the necessary electricity, RenEnergy was tasked to design a plan where renewable energy is used to supply the electricity needs of the project. The existing Eskom supply will therefore be supplemented with Solar Energy which is more sustainable.

Based on the electrical equipment that would be installed inside each one of the 20 broiler houses, the broiler houses will have a total peak power requirement of around 301.5kVA, including the new infrastructure at the entrance of the farm and requirement of the existing infrastructure, the total load requirement for the farm is estimated to be 312kVA. Solar panels are proposed on the roofs of the chicken houses. At a designated area close to the delivery point of Eskom the containerised solar batteries (distribution station) will be placed, and a generator room will be built to house the backup generators. A bunded Diesel Tank (2200L) will also be located within close vicinity of the Generator Room. A low voltage (LV) underground cable will go from the existing Eskom point/transformer, via a trench, to the distribution station. A step-up transformer and 11KV overhead line will then distribute power from the distribution station to the proposed facilities. The electrical cable will have a copper core and isolated with PVC. Where the cable crosses the stream (purple dot) a treated timber pole will span the stream, and the cable will be attached to the pole.

Water: A Water Treatment Plant is proposed to treat the water from the existing Boreholes (BH1 & BH2) which will be fed via a pipeline from the boreholes to the Water Treatment Plant. Thereafter, treated water will be sent to two proposed reservoirs (300kl each) on site. Water will be sent from the main reservoir directly to the broiler houses. Water storage tanks will be located at each chicken house (1 x 5000 L & 1 x 1000 L). All water pipelines will run, as far as possible, on the side of existing and the new roads. The water pipeline consists of a PVC pipe. Where the water pipeline crosses the watercourse a treated timber pole will span the watercourse, and the pipeline will be attached to the pole.

Waste: Underground septic tanks will be located at the new ablution and domestic dwelling to manage domestic sewage. The tanks will have a capacity of ±11m3 and will fall outside a 100m buffer from any watercourse/ wetland. Cold storage will be utilised as temporary storage for mortalities which will then be disposed of at a bio-approved landfill site or processed at an existing rendering plant (off-site). Domestic organic materials will be composted onsite as part of each household's composting arrangement. The remaining solid waste will be separated into recycled and non-recycled materials and removed from the site on a weekly basis to the local municipal waste facility.

Manure will be dry swept and cleaned out of the chicken houses whereafter high-pressure washing pumps will be used to clean the pens with any residual water washed onto the free-range pasture and lost through evaporation. Chicken Manure will be used directly in the agricultural industry to be collected by surrounding farmers for crop fertilisation.

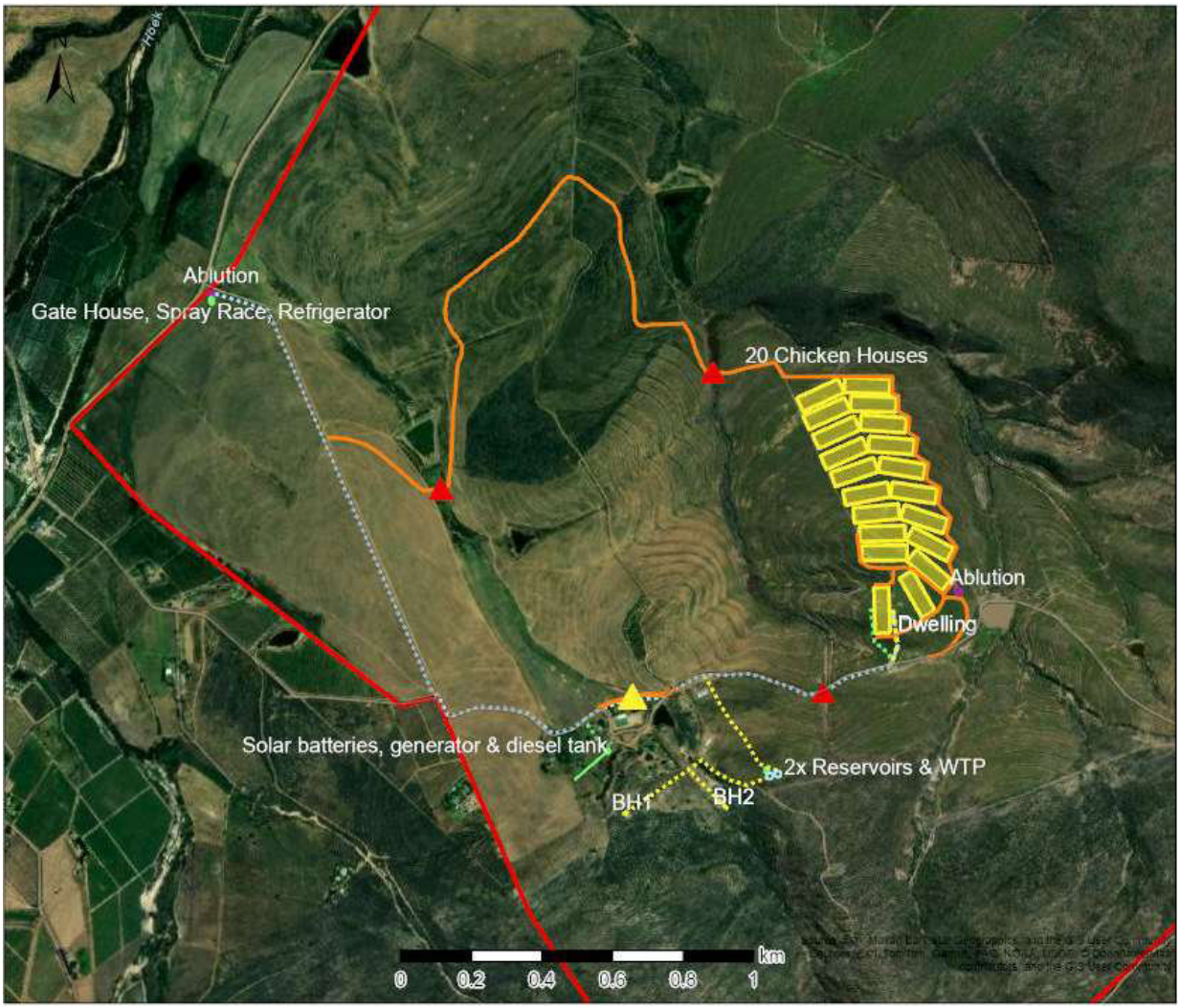


Figure 3: Showing the proposed activities within the property boundaries (red line): new realigned roads (orange), trenched water pipeline (yellow and blue/grey dotted line), trenched electrical cable (solid green line), the overhead electrical distribution lines (green and blue/grey dotted line) and the triangles indicate the river crossings (red = low water bridges; yellow = suspended). Refer to Annexure 3A.

Please refer to **Annexure 3B**, which includes a map showing the proposed activity components and associated infrastructure on the environmental sensitivities of the site including no-go areas for development.

1.4 ENVIRONMENTAL LEGISLATION:

1.4.1 National Environmental Management Act, 1998 (Act 107 of 1998), as amended ("NEMA")

NEMA makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority based on the findings of an Environmental Impact Assessment (EIA). NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). In the Western Cape, these powers are delegated to the Department of Environmental Affairs & Development Planning (DEA&DP). According to the list of activities identified under the EIA Regulations, by Listing Notice 1 (GN. R. 327), Listing Notice 2 (GN. R. 325), and Listing Notice 3 (GN. R. 324), published in Gazette No. 40772 on the 07 April 2017, the following activities are triggered and require environmental authorisation:

Listing Notice 1 (BASIC ASSESSMENT):

1 - *The development of facilities or infrastructure for the generation of electricity from a renewable resource where—*
~~(i) the electricity output is more than 10 megawatts but less than 20 megawatts;~~ or
(ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare; excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs—
(a) within an urban area; or
(b) on existing infrastructure.

5 - *The development and related operation of facilities or infrastructure for the concentration of –*
~~(i) more than 1 000 poultry per facility situated within an urban area, excluding chicks younger than 20 days;~~
(ii) more than 5 000 poultry per facility situated outside an urban area, excluding chicks younger than 20 days;
~~(iii) more than 5 000 chicks younger than 20 days per facility situated within an urban area; or~~
~~(iv) more than 25 000 chicks younger than 20 days per facility situated outside an urban area~~.

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 development and where indigenous vegetation will not be cleared.

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.

Listing Notice 3 (BASIC ASSESSMENT):

4 - *The development of a road wider than 4 metres with a reserve less than 13,5 metres.*
Western Cape:
In areas containing indigenous vegetation

14 - *The development of—*
(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or
(ii) infrastructure or structures with a physical footprint of 10 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 has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;

excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

Western Cape
i. Outside urban areas:
(aa) A protected area identified in terms of NEMPAA, excluding conservancies;
(bb) National Protected Area Expansion Strategy Focus areas;
(cc) World Heritage Sites;
(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
(ee) Sites or areas listed in terms of an international convention;
(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
(gg) Core areas in biosphere reserves; or
(hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.

1.4.2 National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA")

The NHRA, provides for the management of national heritage resources, to set norms and maintain national standards for the management of heritage resources in South Africa, and to protect heritage resources of national significance, so that heritage resources may be bequeathed to future generations.

The proposed activity will not impact on any heritage resources and therefore no further action is required under Section 38 of the NHRA. However, should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately, and Heritage Western Cape must be notified without delay.

1.4.3 National Water Act, 1998 (Act No. 36 of 1998) ("NWA")

The NWA is the primary statute providing the legal basis for water management in South Africa and has to ensure ecological integrity, economic growth and social equity when managing and using water. The fundamental objective of the National Water Act (Act 36 of 1998) is to ensure the protection of the aquatic ecosystems of South Africa's water resources. The NWA includes provisions requiring that a water use license be issued by the Department of Water & Sanitation (DWS) before a landowner engages in any activity defined as a water use in terms of the NWA (e.g. taking of water from a resource (Section 21 a); Impact on freshwater resources (Section 21c & i); Storing of water (Section 21b); Disposing of waste in a manner which may detrimentally impact on a water resource (Section 21g)).

The Catchment Management Agency acting on behalf of DWS is known as the Breede Olifants Catchment Management Agency (BOCMA) within this region. The proponent has initiated the water use authorisation application process regarding the proposed S21 (a) for the abstraction from the 2 boreholes on site; S21(c) and (i) for the proximity of infrastructure and boreholes to regulated areas of wetlands and drainage lines. The ELU has been confirmed by BOCMA.

1.5 THE EMPr DOCUMENT

An Environmental Management Plan (EMPr) can be defined as "*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced*". EMPr's are therefore important tools for ensuring that the management actions arising from EIA processes are clearly defined and implemented through all phases of the project life cycle.

The EMPr forms part of the contract identifying and specifying the procedures to be followed by the Applicant to eliminate or reduce adverse impacts during the construction and operational phase. Should the owner or employee persistently fail to observe provisions of the EMPr, the Environmental Control Officer (ECO) should notify the relevant authority for a compliance audit, and possibly the prosecution of an individual or the removal of the individual from site.

The Environmental Contract ascribes legal status to the EMPr and any subsequent amendments thereto. The EMPr includes all relevant documentation within this report and/or referred to within it. NEMA, and the respective Regulations, are pertinent to this development. All activities on site must adhere and comply with the provisions of these Acts.

In general, the EMPr can consist of the following phases: ***planning & design***; ***pre-construction activities***; ***construction activities***; ***rehabilitation &/or decommissioning***; and lastly ***operational activities***. However, the need to include all the above phases is dependent on the scale and scope of each individual project. For the purposes of this application the following three categories are largely defined:

- **Planning, Design & Pre-construction Phase**: This section relates to the demarcating of the proposed activity footprint areas versus no-go areas.
- **Construction Phase**: This section relates to the construction of all buildings (dwellings, outbuildings, chicken pens, ablutions etc.), roads and associated infrastructure to accommodate services.
- **Operational Phase**: This section is intended to guide the operation and maintenance aspects associated with the infrastructure relating to the proposed Broiler Facility, dwellings and infrastructure in line with relevant legislative requirements and the recommendations made by the specialist consultant (s).

Please note: The first two phases can overlap and are generally also referred to collectively as the CEMP (Construction Environmental Management Plan). The final phase can also be referred to as the OEMP (Operation Environmental Management Plan).

The EMPr will be reviewed by the ECO on an ongoing basis. Based on observations during site inspections and issues raised at site meetings, the ECO will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site. Any such changes or updates will be registered in the ECO's monthly record, as well as being included as an annexure to this document. Annexures of this nature must be distributed to all relevant parties on site.

The following content is required in the EMPr in accordance with Appendix 4 of the EIA Regulations:

a) details of–
  (i) the EAP who prepared the ; and
  (ii) the expertise of that EAP to prepare an , including a curriculum vitae;
b) a detailed description of the aspects of the activity that are covered by and as identified by the project description;
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;
d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including—
  (i) planning and design;
  (ii) pre-construction activities;
  (iii) construction activities;
  (iv) rehabilitation of the environment after construction and where applicable post closure;&
  (v) where relevant, operation activities;
e) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to —
  (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  (i) comply with any prescribed environmental management standards or practices;
  (ii) comply with any applicable provisions of the Act regarding closure, where applicable; &
  (iii) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;
f) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
g) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);
h) an indication of the persons who will be responsible for the implementation of the impact management actions;
i) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
j) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
k) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;
l) an environmental awareness plan describing the manner in which—

(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and

(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and

m) any specific information that may be required by the competent authority.

1.6 KEY TERMS AND ABBREVIATIONS

a) **Applicant**– The person or legal entity that has made application to the competent authority for environmental authorizations and who will have the overall responsibility to adhere to the relevant legislation and comply with the environmental authorization.

b) **Contractor/ Farm Manager –**

(i) the main or specialised contractors as engaged by the Applicant from time to time for the execution of the works, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the works.

(ii) any other contractor from time to time engaged by the Applicant directly in connection with any part of the works which is not a nominated subcontractor or a subcontractor to the main contractor.

(iii) the main or specialised operator or farmer as engaged by the Applicant from time to time for the execution of the farm operation.

c) **Council** – the local municipal authority that operates or is responsible in said area.

d) **Days** – the days of the week excluding Sundays and legal public holidays.

e) **Environmental Authorization** also referred to as the ROD is the Record of Decision as issued by the Provincial Government Department arising from the application for Environmental Authorization through either a basic assessment or full EIA process.

f) **Environmental Management Programme (EMPr)** – this document as amended or varied from time to time, to control the implementation of the works on the site in such a way as to ensure that they do not result in undue or reasonably adverse impacts on the environment.

g) **Environmental Control Officer (ECO)** – a suitably qualified individual or site manager to be appointed by the Applicant, and his successor/s should he cease to hold such appointment for any reason, to oversee the implementation of the EMPr and environmental agreement until the completion of works on the site.

h) **Land Surveyor - (LS)**

i) **Resident Engineer (RE) –** the representative Engineer or specialist from the department of Agriculture present on site for that part of the works.

j) **Site Manager –** the employee of the main contractor or Applicant responsible for the day-to-day control of all activities and operation on site.

k) **Works –** the construction operations, all related and incidental works such as, but not limited to, site works, fencing, earthworks, roads, and ploughing of the authorised area.

SECTION 2: ENVIRONMENTAL IMPACTS

2.1 IMPACTS:

2.1.1 Botanical and Freshwater Ecosystems

Loss of biodiversity and ecological structure:
The proposed activities involve the installation of three new road crossings, two over Streams A and B, and one over Stream C, as well as one pipeline crossing over Stream B. The road crossings will require soil excavation, vegetation clearance, and in-stream construction, and are therefore expected to have a definite impact on biodiversity and ecological structure at the crossing points. In contrast, the pipeline crossing will consist of a treated timber pole spanning the watercourse, with the pipeline mounted above the stream. As this method avoids direct disturbance to the streambed and banks, it is expected to have minimal impact on the aquatic environment.

Streams A and B have already been assessed as being in a largely to seriously modified state with low EIS at the proposed crossing locations, with significant existing alterations to the streambed and banks, as well as extensive vegetation removal. Consequently, the construction of road crossings over Streams A and B is expected to result in a short-term, low negative impact.

Although the general condition of Stream C was found to be in a largely natural state with high EIS, the proposed road crossing will be located at an existing informal crossing that has already undergone vegetation clearance and soil compaction. The formalisation of this crossing, combined with the rehabilitation of the surrounding disturbed areas, is anticipated to result in a long-term, low to medium positive impact on the directly surrounding section of the stream.

Should all mitigation measures be taken into account, the general impact of the above activities would be **Short-term, Low Negative nature (Construction Phase)** and **Long Term, Low to Medium Positive nature (Operational Phase).**

Water quality impairment:
During the construction phase, vegetation clearing and physical disturbances to stream banks and wetland areas at freshwater crossings may increase the risk of erosion and subsequent sedimentation in downstream freshwater systems. Additionally, construction activities inherently carry a risk of general pollution, which could lead to the degradation of surface water quality in receiving freshwater features. This impact is expected to be of a short-term, low to medium negative nature, affecting the immediate surrounding freshwater environment.

Looking at operational phase impacts, the nature of the proposed development, a chicken broiler facility located on a slope, poses a potential risk of significant water quality degradation in nearby freshwater systems. Broiler litter is typically rich in nutrients, microbes, organics, and trace metals; therefore, runoff from the broiler site could lead to eutrophication in downstream areas, particularly following the first seasonal rains. If not properly mitigated, such runoff could substantially degrade water quality and indirectly impact aquatic biodiversity associated with the streams.

The client has indicated that management practices will include dry sweeping and the removal of manure, followed by high-pressure washing of broiler areas, with wash water directed into surrounding pastures. In addition, as part of a stormwater management plan, the construction of stormwater swales along access roads is proposed, designed to accumulate runoff in designated dry pans.

Should the above be applied, the operational phase of the project is expected to have a very low negative impact on water quality within Streams C and D.

If these mitigation measures are adhered to, the impact of the proposed upgrade works is expected to have a **Low to very low negative impact on the water quality of downstream freshwater features**.

Flow modification and change in sediment balance:
If flow is present during construction, activities within the streams and associated wetland areas may impede flow, resulting in short-term hydrological modifications to downstream wetland features and potentially causing prolonged inundation of upstream wetland areas. Although construction is planned for the drier summer months, the risk of flow disruption remains. Warm and dry conditions may exacerbate impacts by reducing the availability of low/baseflows, thereby affecting ecosystems downstream that rely on these flows for ecological functioning.

The initial design for the proposed stream crossings (now the alternative option), particularly at the confluence of Streams A and B and at the lower crossing over Stream C, did not accommodate subsurface flow. This would have impeded groundwater movement and likely caused fragmentation and possible desiccation of downstream wetland areas associated with these reaches. In response, the preferred option now incorporates subsurface drainage via a no-fines sub-soil drain and an embedded pipe network to maintain hydrological connectivity and lower any flow modification impacts associated with these structures.

Should all mitigation measures be taken into account, the general impact of the above activities would be **Short-term, Low Negative nature (Construction Phase)** and **Long Term, Low to Negligible Negative nature (Operational Phase).**

With the implementation of appropriate mitigation measures, the proposed activities with their expected operational phase are expected to result in a general short-term low negative impact on the site's freshwater features.

2.1.2 Socio-Economic

Direct and indirect employment opportunities (temporary and permanent) and skills transfer to new employees. Significant financial contribution to the local economy and a knock-on effect for trade in local economy. This will have a **medium – high positive impact.**

2.1.3 Geohydrological

Depletion of the Groundwater Resource as a Result of Over-Abstraction: Groundwater level monitoring is recommended to ensure that groundwater abstraction is sustainable. The monitoring will also indicate if the groundwater resource is impacted and if mitigation measures can be instituted before long-term impacts occur. Mitigation for over-abstraction would be a reduction in abstraction.

Quality Deterioration as a Result of Over-Abstraction: Groundwater quality monitoring is recommended to ensure that groundwater abstraction is sustainable. The monitoring will also indicate if the groundwater resource is impacted and mitigation measures can be instituted before long term impacts occur. Mitigation for over-abstraction would be a reduction in abstraction.

Groundwater abstraction impacting surface water: Groundwater monitoring is recommended to ensure sustainable abstraction and to detect any potential impacts on surface water early. Mitigation measures can then be implemented to prevent long-term impacts. In the event of over-abstraction, a reduction in pumping is the primary mitigation measure.

The risk of groundwater contamination due to a leaking septic tank, which may detrimentally impact a water resource. The aquifer vulnerability is 'low to medium' as determined by the DRASTIC methodology, the risks associated with leakage of wastewater from the septic tank are determined as medium risk since the upper formation of the aquifer consists of the Gydo Formation, which acts as an aquitard. Even with a low vulnerability, there is always a chance that leakage can occur. Therefore, management and preventative measures are crucial to safeguard the aquifer from contamination and mitigate its potentially severe consequences. By implementing the proposed mitigation measures, the risk of groundwater contamination can be significantly reduced (LOW), protecting both water quality and the surrounding ecosystems.

2.1.4 General Impacts

Nuisance Impacts (Dust, Noise & Odour) (LOW -)
Dust generation as a result of the construction phase and traffic generation during the operational phase. Noise impacts should be limited due to the rural nature of the surrounding area and the nature of the existing activities being undertaken on site as well as the position of the Broiler Facility within the site. The Broiler Facility is located centrally within the greater property and therefore is located well away from sensitive receptors. Odour could result from mismanagement of chicken manure and pens. However, strict biosecurity protocols are to be put in place which would mitigate these impacts.

Waste (LOW -)
Waste generation from the construction and operational phases (including hazardous waste resulting from infectious mortalities).

Visual (LOW -)
Possible increase in visual intrusion within the agricultural landscape. Higher intensity agriculture could result in increased hardened surfaces within the agricultural landscape.

Traffic (LOW -)
Increased use of access roads and therefore generation of traffic.

2.2 IMPACT MITIGATION:

2.2.1 Botanical and Freshwater Ecosystems:

Loss of biodiversity and ecological structure:

Construction Phase:

- All road crossing structures must be designed to avoid obstruction of streamflow, including low flows.

- Construction activities directly involving freshwater features (i.e., road and pipeline crossings) should preferably be scheduled during the dry summer months—typically from December to March—when rainfall and runoff are at their lowest.
- If any flow is present within the streams during construction, appropriate measures must be taken to divert the water around the work area and ensure its release downstream.
- A buffer zone extending 6 meters upstream and downstream of the construction footprint should be clearly demarcated. No disturbance or activity should occur beyond these designated areas within the stream channel.
- The boundaries of this buffer zone must be physically demarcated using high-visibility fencing or flagging prior to the commencement of any construction activities.
- Work within the stream channels should be limited strictly to essential areas.
- Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted.
- All wetland/stream areas disturbed during construction must be rehabilitated and revegetated with appropriate indigenous wetland and riparian buffer species once construction is complete.

Operational Phase:

- All rehabilitated and revegetated areas within the wetland/stream areas should be monitored for the following 2 years, ensuring the establishment of good plant biodiversity.
- Monitoring of all stream crossings for signs of erosion, debris build-up or nuisance growth around the culverts, should be included and addressed in a formal Maintenance and Management Plan for the project.
- No use of machinery is allowed within any wetland/stream channels for the operational phase.
- All debris must be removed and properly disposed of.
- No dumping of debris should be allowed in the stream/wetland areas.
- Any wetland/ riparian or instream areas disturbed by Maintenance activities to be rehabilitated and revegetated (if necessary) after maintenance works

<u>Water quality impairment:</u>

Construction Phase

- As mentioned above, construction activities should preferably take place during the drier months, and special attention should be given to managing water quality impacts in the construction Environmental Management Programme (EMP).
- Temporary silt fencing, sandbags, or berms should be installed within downstream channels to prevent sediment generated during construction from entering downstream freshwater features.
- Implement a phased clearing approach, limiting vegetation clearance to areas required for active construction only.
- Designate stockpile locations at least 50 metres away from any watercourses or wetland areas.
- Prevent contaminated runoff from construction sites from entering adjacent streams or wetlands by using diversion drains and berms. Temporary detention basins or sediment traps should be constructed to capture excess sediment before it reaches wetland or stream areas.
- Good Site Management Practices include:
    - Portable chemical toilets must be provided at all work sites, or ensure that conveniently located site toilets are available. Toilet facilities must not be located within 100 metres of any stream or wetland areas.

- Maintain and clean toilets regularly to ensure they remain in good working order and hygienic condition.
- No waste or foreign materials may be dumped into streams or wetlands. These areas must also not be used for cleaning clothing, tools, or equipment.
- Prevent the discharge of water containing polluting matter or visible suspended solids directly into streams or wetland areas.
- Immediately clean any accidental oil or fuel spills or leaks. Do not hose or wash spills into the surrounding natural environment.
- All operations involving the use of cement and concrete (outside of the batching plant) must be carefully controlled.
- Limit cement and concrete mixing to designated sites wherever possible.

Flow modification and change in sediment balance:

Construction Phase

- All new culverts must be designed to accommodate anticipated peak flow volumes to prevent flow impedance and minimize the risk of erosion following high-rainfall events.
- Culverts should be installed at or slightly below the natural streambed level to avoid obstructing low flows and to facilitate the unimpeded movement of aquatic biota.
- As mentioned under "Loss of Biodiversity", should flow be present during construction, temporary diversion structures should be implemented to reroute stream and wetland flow around the active work area, ensuring that low flows remain uninterrupted throughout the construction period.
- As the client proposes to include subsoil drainage in the low-water bridge structures, the following mitigation should be taken into account:
  - Drainage should consist of several pipes or a continuous stone layer.
  - The subsoil drain's cross-sectional area should roughly match or exceed the flow cross-section of the natural subsurface seepage path, both up and downstream of the bridge. This should be at a minimum 0.3–0.5 m depth and width.
  - The subsoil drain must be wrapped in geotextile or similar to keep fine wetland sediments out.
  - Stone size must be uniform and coarse to maintain voids for long-term flow.

Operational Phase

- Regular maintenance should be conducted to remove debris accumulation and control nuisance vegetation growth to prevent blockages and ensure continued flow through culverts.

2.2.2 Socio Economic:

The socio-economic impacts are positive, and no mitigation is proposed.

2.2.3 Geohydrological:

It is advised that the boreholes be tested for the parameters outlined in Table 2 which refers to the General Notice 169 of 2013, *Table 2.2: Monitoring requirements for domestic wastewater discharge.*

Table 2: General Notice 169 of 2013, Table 2.2: Monitoring requirements for domestic wastewater discharges

Discharge volume on any given day	Minimum Monitoring Requirements
10-100 cubic meters	Faecal Coliforms (per 100 ml)
	pH
	Electrical Conductivity (mS/m)

The management of the groundwater abstraction includes the following recommendations:

1. It is recommended to maintain a constant and continuous pumping schedule as much as possible. Thus, should a daily volume of less than 319 680 L/d for KF_BH1 and 103 680 L/d for KF_BH2 be required, it is recommended to decrease the pumping rate and not the pumping duration. By pumping continuously instead of a stop-start schedule, iron oxidation in the borehole is minimised, decreasing the amount of iron precipitation inside the boreholes and pumps.

2. An "observation pipe" needs to be installed (32 mm inner diameter. class 10 - Figure 4 [Goal 8 in Section 4.3.3 below]) from the pump depth to the surface, closed at the bottom and slotted for the bottom 5 – 10 m, for the production borehole. This allows for a 'window' of access down the borehole which enables manual water level monitoring and can house an electronic water level logger.

3. Continuous monitoring of groundwater levels using pressure transducers in the borehole is ideal. The water level in the borehole may not drop below the critical water level (Table 2 [Goal 8 in Section 4.3.3 below]). If the water level in the borehole drops below the critical water level, abstraction must be immediately reduced by 10 %. Monitoring must continue and after 30 days, if the water level in the borehole does not recover to above the critical water level, abstraction must be reduced by a further 10%. This process must continue until the water level in the borehole is stable.

4. Water quality monitoring, which includes sampling and analysis of the groundwater at an accredited laboratory, is important. A sampling interval of quarterly is recommended for the first year of monitoring; thereafter, the water quality monitoring should be reviewed and can potentially be reduced to annual as proposed in Table 3 [Goal 8 in Section 4.3.3 below].

5. The monitoring data should be reviewed on quarterly basis for the first two years and can then be scaled down to bi-annually.

6. Installation of a sampling tap at the production borehole (to monitor water quality) is essential.

7. Installation of a flow volume meter at the production borehole (to monitor abstraction rates and volumes) is also important. External flow (e.g. mag-flow) meters are recommended.

8. Abstraction volumes must be monitored and recorded by a designated person on site. Depending on the frequency of use, daily, weekly or monthly abstraction should be recorded.

9. The appropriate borehole pump must be installed. i.e. not an over-sized pump that is choked with a gate valve. If the monitoring shows that more water can be abstracted, then the duration of pumping time can be increased (not the flow rate).

10. If required, the pump and borehole casing (and associated infrastructure) can be serviced annually and cleaned.

11. A geohydrologist should review the above information at least annually to ensure optimal groundwater abstraction and management occurs.

12. The relevant DWS monitoring officer (as specified in the Water Use Licence) should be informed if water levels are dropping to critical level or if any parameters, as specified in Table 3 [Goal 8 in Section 4.3.3 below]. Changes by 20%.

The groundwater abstraction should be reviewed to ensure that it is sustainable based on the monitoring data obtained.

2.2.4 General:

General impacts include: nuisance factors (i.e. dust, odour and noise), waste management, visual impacts, traffic impacts and stormwater impacts. All general impacts would be mitigated through the implementation of the Environmental Management Programme (EMPr) (THIS DOCUMENT). Planning, Design, Construction and Operational phase impacts are addressed in Section 4 below.

Refer to Annexure 3B: Environmental Sensitivities Map.

SECTION 3: KEY STAKEHOLDERS

3.1 The Competent or Lead Authority

DEA&DP is the competent or lead authority in this instance. This Directorate has overall responsibility for ensuring that the Applicant complies with the conditions of its EA as well as this EMPr once approved. During the construction (and operational phases) of the EMPr the lead authority will have the following role to play:

- The authorities may perform random controls to check compliance.
- Review Monitoring and Audit reports, if required.
- Whenever necessary, the authorities are to aid in understanding and meeting the specified requirements.
- Recommend suitable corrective measures are undertaken by the Applicant where non-compliance has been reported.
- Enforcing compliance by the Applicant.

3.2 The Applicant

The Holder of the EA (e.g. the Applicant) is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts, both in the construction and operational phases. The Applicant therefore has overall and total environmental responsibility to ensure that the EMPr is implemented and that both the EMPr and the EA are complied with at all times. The Applicant is also responsible for ensuring that all other environmental related legislation is complied with (i.e. NWA). The Applicant is responsible for the development and implementation of the conditions of the EA in terms of the planning and design of the development and construction thereof.

Amongst the general responsibilities above the Applicant is also responsible for:

- Appointing an ECO and where required an environmental auditor.
- Take the necessary action in terms of non-compliances.
- Ensuring that all of the Applicant's, staff, representatives, contractors, consultants and any other agent operating under the employ of the Applicant comply with the EA.
- Considering the ECO's observations and recommendations and acting where required.

3.3 Environmental Control Officer (ECO)

A suitably qualified individual will be designated to fulfil the role of Environmental Control Officer, to ensure and oversee the implementation of the EMPr in its entirety on site during construction and earthworks on the entire site.

The role of the ECO is essentially seen as an interactive one which involves site visits approximately once a month at the start of construction. Site visits may need to be less frequently during certain stages of the development, depending on the sensitivity of the area in which construction is taking place.

The responsibilities of the ECO or designated person during the construction phase of the project will include:

- To environmentally educate and raise the awareness of the Contractors and their staff as to the sensitivity of the site and to target responsible individuals as key players for environmental education, to facilitate the spread of the correct environmental attitude during the contract work.

- To review method statements and to determine the most environmentally sensitive options of modus operandi for the development tasks.
- To oversee the implementation of environmental procedures set out in this document.
- To attend site contractor's meetings and report on environmental issues.
- To receive notices and minutes of all site meetings.
- To maintain an open and direct channel of communication with the RE, who will be immediately aware of the actions of the ECO at all times, especially as they relate to implementation policy and corrective actions as detailed in this document.
- To take immediate action on site where clearly defined no-go areas are violated, or in danger of being violated, and to inform the RE and Site Manager immediately of the documents and the action taken.
- To keep an up-to-date record of works on site, as they relate environmental issues in the site diary.
- To be contactable by the public regarding matters of environmental concern as they relate to the development. Such matters shall be recorded in the Site Diary.
- To be responsible for auditing and reporting.

3.4 Contractor / Farm Manager

The Contractor/ Farm Manager (as per definition this can be the Applicant as well) will be required, where specified, to provide Method Statements setting out in detail how the management actions contained in an EMPr will be implemented in order to ensure that the environmental management objectives are achieved. The responsibilities will include:

- Demarcating the no-go areas within the vicinity of the proposed activities through the appropriate fencing as discussed and agreed upon with the ECO.
- Complete Site Inspection Forms on a regular basis (eg. weekly).
- Provide inputs to the regular (eg. monthly) environment report to be prepared by the ECO.
- Liaise with the 'construction team' on issues related to implementation of, and compliance with, the EMPr.
- To oversee the implementation of environmental procedures set out in this document.
- Compilation of a maintenance routine, with tasks and budget and timing factors.
- Compilation of a monitoring plan.

3.5 The Environmental Auditor

Where required by the EA an environmental auditor will be appointed by the Applicant. The auditor will be an independent environmental consultant. The auditor will carry out a compliance audit based on the EA and of all of the activities being undertaken.

SECTION 4: IMPACT MANAGEMENT OUTCOMES AND ACTIONS

This section includes a description of proposed impact management actions, identifying the manner in which the impact management outcomes will be achieved and, where applicable, include actions to avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation & comply with any prescribed environmental management standards or practices.

4.1 Pre-Construction Management Plan

The pre-construction or planning management plan is to be used as a guide during the planning, design and detailing of the development activity.

4.1.1 General Requirements:

A. Contractual Communication Procedures on Site

A logbook will be kept on site for the purposes of recording on-site instructions and as a general record of environmental issues. The diary must be kept for a minimum of two years after the activity is completed for the relevant authority to review if deemed necessary. A photographic record of before and after construction will be kept for visual reference purposes. The logbook will consist of three sections:

Environmental Site Instruction Section
The Environmental Site Instruction Section will be used for the recording of general site instructions relating to the protection of environmentally sensitive or potentially impacted areas or features on the site, by the ECO, to facilitate the issuing of the site instruction by the RE.

Site Diary Section
The purpose of this section will be to record the comments of the ECO as they relate to activities on the site, any problems encountered, or comments or complaints received from the public about works from the site.

Monitoring Section
The purpose of this section will be to record the comments of the ECO during Construction and the effective implementation of all mitigation measures (including: waste, recycling, landscaping and renewable energy measures etc.) used during the life cycle of project.

This book is to remain on site at all times and is to be made available for monitoring purposes by the local authority as required.

B. Communication/Contractual Network

There is to be continual communication between the Applicant; RE, Contractor, Site Manager and the ECO. The ECO will advise all on factors relating to the EMPr and all environmental matters on site.

The ECO is empowered to order the Contractor immediately to cease any activities or operations that are required to be stopped as a matter of urgency to prevent serious adverse environmental impacts or potential impacts on the site or any of the adjacent properties or areas outside the boundaries of the site. The ECO shall without delay report any such actions to the Competent Authority. The suspension will be enforced until corrective action has been taken, with no extension of time for such delays. In such a case, all costs are to be borne by the Contractor.

C. Method Statement Format

For any activity the Contractor is requested to submit a method statement for comment by the ECO, the format should clearly indicate the following:

- What: a brief description of the work to be undertaken;
- How: a detailed description of the process of work, methods and materials;
- Where: a description/sketch map of the locality of work; and
- When: the sequencing of actions with due commencement dates and completion date estimates.

The Contractor must submit the method statement to the ECO prior to the start of any construction activity. Work may not commence until the comments of the ECO have been received and taken into consideration.

D. Programming of Construction Events

The ECO must be supplied with a detailed program of all construction events to allow for proper monitoring and planning on site. Any amendments to the program of construction events for any reason must be forwarded to the ECO.

E. Bylaws and Regulations

All national and provincial laws and regulations, as well as all local authority bylaws and regulations which apply to the development of this site are to be adhered to.

Consent Use is required in terms of the Breede River Municipality Zoning Scheme By-Law, a Consent Use on Agriculture for 'Intensive Animal farming'. A **Water Use Licence** is required from BOCMA.

F. Safety

The Contractor is to appoint a safety steward, who will be responsible for safety of the labour force, construction activities and handling emergency situations on site during construction hours.

G. Emergency

All accidents and emergency situations are to be reported to the ECO and Site Manager and full details included in the monthly environmental report.

<u>Fire</u>
The contractor must take appropriate measures to guard against accidental fire, and it will be presumed that any bush fire which starts on the site, or within 100m thereof during the construction period would be the responsibility of the applicant.

In the case of a fire occurring on site, the Applicant and Site Manager (safety steward) are to be notified immediately. If fairly localised and effort should be made to extinguish the fire immediately and if required, the assistance of the local fire department should be sought by the safety steward.

Fire beaters and "bakkie sakkie" are to be kept on site, and easily accessible at all times, and not locked away. No open fires may be lit anywhere on the construction site, except at locations approved by the ECO

and Site Manager. The burning of refuse or vegetation material on site as a means of disposal will not be allowed unless a permit for burning is issued by the competent authority.

First Aid
The Contractor must provide and maintain a suitable first aid kit on site, with a member of staff suitable qualified in first aid on site during working hours, in accordance with the Occupational Health and Safety Act.

H. Public Complaints

All public complaints received are to be registered by the ECO or Site Manager and addressed immediately. Public complaints and responses are to be recorded in the Site Diary and included in the monthly environmental report by the ECO.

4.1.2 Design Requirements

A. Low-water bridge structures

Drainage should consist of several pipes or a continuous stone layer.

The subsoil drain's cross-sectional area should roughly match or exceed the flow cross-section of the natural subsurface seepage path, both up and downstream of the bridge. This should be at a minimum 0.3–0.5 m depth and width.

The subsoil drain must be wrapped in geotextile or similar to keep fine wetland sediments out.

Stone size must be uniform and coarse to maintain voids for long-term flow.

B. Visual Screening

Use earth tones or muted colours on buildings to reflect the local landscape on all buildings.
Rows of indigenous and fast-growing trees will form part of the free-range areas for shade along the new structures, that will screen buildings from any visible receptors.

C. Waste, Water & Energy Guidelines

During the lifespan of human habitation people generally waste on a daily basis. Examples of additional wastage are excessive electricity consumption for lighting and air-conditioning and excessive water usage.

Water Measures
The following Water Efficiency Measures will be implemented:

- Ensure that only water efficient devices such as low-flow taps, low-flow showerheads, washing machines and dishwashers are used.
- Ensure that all toilets are low volume (9.5 litres or less), with dual-flush or multi-flush.
- Ensure that outbuildings and outside taps and showers are fitted with metering tap buttons, which have set timers to prevent taps being left on or dripping.
- Design the layout of the plumbing system to avoid long pipe runs between the geyser and supply points.

- Reduce hard surfacing to encourage rainwater to seep back into the ground.
- Design paved areas so that water run-off is slowed down and where possible use soak-aways and permeable paving that allows water to filter into the ground.
- Ensure that the optimum pipe size and water pressure is used. A pressure reducing valve can be installed at a point nearest to where the supply enters the building to ensure that all water supplies in the building are balanced.
- Ensure all buildings are harvesting rainwater and encourage the re-use of grey water where appropriate. However, ensure that the local ecological system is not polluted and that it is managed correctly.
- To keep the volume of polluted water to be disposed of to a minimum, stormwater should not be mixed with greywater (e.g. from baths, showers, sinks, washing machines etc.).
- Ensure the use of indigenous planting and efficient irrigation methods, such as drip irrigation.

Energy Efficiency

Reducing the energy consumption of a building not only saves the environment but will also save on the running costs of the building. By designing energy efficient or renewable energy options into a building, the demand for electricity during peak consumption times is reduced. The following Energy Efficiency Measures will be implemented:

- The proposed dwellings and agricultural water pumps will be supplied with electricity generated on the farm by means of solar panels that will be affixed to the roofs of each dwelling unit and other structures connected to electricity storage devices and inverters.
- Install properly insulated ceilings.
- Place and size windows to make optimal use of natural light, winter heating and ventilation without creating draughts, or gaining too much heat in summer or losing heat in winter.
- Avoid the use of air conditioning, or at least ensure that the correct size is installed and that use of the unit is minimised.
- Use air conditioners with a seasonal energy efficiency ratio of 10 or more (ratio of the seasonal energy output to the seasonal energy input).
- Ensure that the building is constructed so as to be tightly sealed, to prevent unwanted air flows. Doors and windows must be appropriately sized and fitted with seals.
- Energy efficient electrical installations must be used.
- Ensure that artificial lighting is designed so that light is focused where necessary, such as brighter areas where tasks are being performed and more ambient light elsewhere.
- Avoid the use of outdoor 'up-lighting' to reduce light pollution.
- Ensure that energy efficient light bulbs, such as CFLs or LEDs, are used.
- Reduce the electrical energy used to heat water by installation of solar water heaters, or at least geyser blankets, pipe insulation and a geyser timer.

Waste

Methods to reduce, reuse and recycle waste need to be encouraged through all aspects of the development:

- Aim for and promote Zero Waste in the planning, operation, management and maintenance of a building. Zero Waste emulates the closed loop processes found in nature, taking a 'cradle –to – cradle' approach to designing products and buildings.
- Build waste avoidance into the process at a design phase, by specifying products and materials that have less wasteful production processes and don't create wasteful emissions during construction and maintenance of a building.

- If waste is created, consider how this can firstly be re-used and then recycled to recover the value invested in these materials, rather than losing this value when the resource is dumped in a landfill or incinerated.
- Facilitate the separation of waste at the source for composting, re-use and recycling when designing waste management systems. People should be encouraged to recycle their household waste.
- Material used during construction or in the life-cycle of the project should be focused on renewable and recyclable elements:
  - Select building materials for durability to minimise maintenance or replacement;
  - Use standard materials to increase the potential for re-use and re-cycling;
  - Materials should be sourced locally where possible; and
  - Use recycled material where possible.

4.1.3 Site Establishment Requirements

A. Environmental Awareness Training for Site Personnel

All contractors/ sub-contractors involved in work on the development are to be briefed on their obligations towards the environmental controls and methodologies. The briefing will usually take the form of an on-site talk and demonstration by the ECO. The education program should be aimed at all levels of management within the Contractor team.

The environmental awareness education program should commence with entry onto the site, prior to any construction activities taking place by each team and is likely to be an ongoing process. All personnel are to be made aware of the details of the EMPr which will be applicable to them, in the languages of the site staff. Contractor teams must also be aware of penalties issued by the ECO in terms of environmental conduct on site, as well as safety and emergency procedures to be followed.

An initial environmental induction must occur to all sub-contractors and associated workers on environmental awareness, including minimisation of disturbance to areas of increased ecological sensitivity (i.e. freshwater ecosystems), as well as fauna and flora with a no poaching policy, management of waste and prevention of water pollution.

A regularly updated record is to be kept of all personnel attending the Environmental Awareness training sessions.

B. Site Definition and Demarcation

Prior to any works commencing on site a site survey is to be undertaken and the placement of boundary pegs (i.e. white stakes) along the areas proposed for development activities are to be erected. Peg coding is to be communicated to the Contractor and all other relevant parties as they may be identified. The approved new development footprints on site must be surveyed and demarcated prior to any site development or vegetation loss (refer to Section C & D below). Areas beyond the white stakes are to be considered no-go areas. All areas outside the boundary of the property are naturally considered no-go areas and boundary fencing is to be secured in areas where work is to take place.

All 'fencing' is to be erected prior to construction works commencing on site and is to remain in position and in good repair for the duration of the construction phase. Once this has been done, all works, including stockpiling of construction materials are to be strictly confined to the demarcated area.

All footprint areas must remain as small as possible and vegetation clearing to be limited to the approved development footprint. Implement a phased clearing approach, limiting vegetation clearance to areas required for active construction only.

Work within the stream channels should be limited strictly to essential areas. Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted.

As there is not enough space at the suspended bridge to divert stream flow to accommodate wet works, a temporary upstream coffer dam must be constructed to temporarily divert stream water away from the wet works during construction. The ECO, in consultation with the Freshwater Specialist and Engineer, will confirm the exact position of the temporary coffer dam as well as ensure that appropriate rehabilitation of the area has been undertaken once the coffer dam has been removed.

C. Protection of Sensitive Features

Sensitive areas within the development area, as identified by the ECO, should be fenced off prior to the start of construction on site (where applicable), to ensure minimum disturbance to these areas during construction activities. Any required buffer areas or no-go areas should be marked prior to the start of construction on site and communicated to the Site Manager.

Vegetation

All protected elements/areas located on the site, will be clearly marked, and care should be taken by the ECO to ensure that they are not unnecessarily disturbed during construction works on site. All alien vegetation must be removed according to standard legislated alien clearing methods.

Apart from the vegetation identified by the project team for removal from the site prior, no indigenous vegetation is to be removed without the written permission of the ECO during the construction phase. Damage to the indigenous vegetation anywhere on the site (outside of the approved area) will be subject to penalties.

Avoid unnecessary trampling of vegetation irrespective of the vegetation being associated with wetland habitats or the surrounding terrestrial area. Retain as much indigenous vegetation as possible (wetland and terrestrial).

Rivers, Riparian Habitat & Wetlands

Construction activities directly involving freshwater features (i.e., road and pipeline crossings) should preferably be scheduled during the dry summer months—typically from December to March—when rainfall and runoff are at their lowest.

A buffer zone extending 6 meters upstream and downstream of the construction footprint should be clearly demarcated. No disturbance or activity should occur beyond these designated areas within the stream channel. The boundaries of this buffer zone must be physically demarcated using high-visibility fencing or flagging prior to the commencement of any construction activities.

Work within the stream channels should be limited strictly to essential areas.

Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted.

No pollutants must be allowed to enter any river system or any other ecologically sensitive areas during the construction phase. No waste or foreign materials may be dumped into streams or wetlands. These areas must also not be used for cleaning clothing, tools, or equipment.

Reptiles, birdlife and mammals

Due to the fact that there are vegetated areas next to the site reptiles, birdlife and mammals occur and move through the system. Any living organism needs to be respected during the construction phase and should not be killed or ran over. Every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). These animals should be relocated to a suitable habitat area immediately outside the project footprint (in the adjoining natural habitats of the site), but under no circumstance to an area further away.

No illegal hunting (either through illegal methods or of rare or threatened species) should be allowed on the site.

Archaeological remains (**Annexure 4: Fossil Finds**)

If any heritage remains are found Heritage Western Cape (HWC) needs to be informed. If heritage remains are disturbed it should be left and demarcated for inspection by HWC. If any archaeological remains (including but not limited to fossil bones and shells, coins, ceramics, antique, marine shell heaps, stone artefacts and bone remains) are discovered HWC need to be notified. If any graves or human remains are discovered HWC need to be notified.

The no-go areas for development are indicated on the Environmental Sensitivities Map (Annexure 3B).

D. Vegetation Clearance

Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted.

Implement a phased clearing approach, limiting vegetation clearance to areas required for active construction only to prevent unnecessary exposure of bare ground (vulnerable to erosion). Establish pastureland and boundary landscaping as soon as possible after clearing.

Vegetation to be removed from the site to facilitate development needs to be identified by the ECO, indicated on a site plan and clearly marked prior to any other works on site. Alien vegetation directly adjacent or in close proximity to the construction area should be removed in line with alien clearing methods.

No vegetation may be removed using fires, and no excess vegetation material may be burned on site. No natural vegetation outside of the site may be removed without approval of the ECO, apart from invasive plant species which are to be removed according to a controlled program.

Once all vegetation clearing is complete, all vegetation and any removed excess material must be disposed of at a licensed refuse facility and may not be mulched or burned on site (unless all approvals have been obtained).

E. Contractor's Camp

As the property is already operating as a working farm the contractors camp would be in line with the current area (Farmyard) being utilised for the purposes of equipment storage and maintenance etc.

F. Toilet Facilities

Suitable sanitary facilities must be provided by the contractor for all staff on site. The Contractor should ensure that ablutions are restricted to the sanitary facilities. Where chemical toilets are provided, the Contractor should ensure that they are kept in hygienic condition and emptied on a regular basis. Waste from the toilets should be disposed of to the satisfaction of the ECO.

Chemical Toilet facilities must not be located within 100 metres of any stream or wetland areas

Care must be taken that no spillage occurs when chemical toilets are cleaned, and their contents are properly stored and removed off site. A contingency plan for spills must be supplied by the contractor and approved by the ECO. Toilets should be located where their use would result in minimal impact on the surrounding environment and may not be in areas of running or standing water during winter and must be secured to prevent them from blowing over.

G. Noise Management

The contractor must take appropriate measures to limit the impact of unreasonable noise from construction activities on the neighbouring land users.

Restrict working hours to weekdays and half day Saturday. No work (apart from vital tasks) on Sundays and public holidays. Create awareness on site of workers to keep noise levels down outside of working hours.

All transport vehicles and machinery/equipment used onsite must be regularly maintained and kept in good working order to prevent excessive noise.

4.2 Construction Management Plan

4.2.1 Material handling and storage

Fuels and flammable materials are to be stored in suitably equipped storage areas. These areas shall comply with general fire safety requirements. Impervious materials are to be used in these storage areas to prevent contamination of the ground in the event of spillages or leaks. Quantities of fuels and hazardous materials stored on site should be appropriate to the requirement for these substances on site.

Immediately clean any accidental oil or fuel spills or leaks. Do not hose or wash spills into the surrounding natural environment.

Bulk fuel depots are to be placed within hardened bunded areas. Bunds are to have a holding capacity equal to 110% of the largest fuel container. The Contractor is to ensure that he is aware of the effects of all substances on staff and the environment, with the correct action to take in the case of any incident involving these materials.

Contractor laydown areas, vehicle re-fuelling areas, stockpiles and material storage facilities to remain outside of all no-go / sensitive areas. A designated contractor laydown area must be approved by the

Environmental Control Officer (ECO) prior to use. Protect exposed soils by means of a geotextile fabric such as hessian sheeting. Site clearing activities (including for contractor laydown areas) are to remain within the authorised footprint and vegetation clearing is to be limited to what is essential within that active footprint.

All operations involving the use of cement and concrete (outside of the batching plant) must be carefully controlled. Limit cement and concrete mixing to designated sites wherever possible.

4.2.2 Waste Management

Management of overburden generated during the construction phase is the responsibility of the Contractor/Owner. Overburden to be re-used as fill for roads on the farm.

The Contractor will be responsible for materials to be re-used on site or removed to a Municipal Transfer Facility and for materials to be disposed of at the municipal landfill site. Management of building material to be sold to the building industry will be the responsibility of the Contractor/Owner.

Waste management during the construction phase is the responsibility of the Contractor. The Contractor must establish a system acceptable to the ECO for control during execution of the works. Refuse refers to all construction debris (cement bags, rubble, timber, cans, nails, wire, spilt bitumen, glass, packaging, plastic, organic matter, etc.). Refuse generated during the execution phase of the works should be stored in an appropriate area on site, protected against wind dispersion and removed on a regular basis for disposal of at a permitted disposal site. No burning or burying of refuse on site should be allowed. Refuse bins must be watertight and wind-proof. Materials suitable for recycling to be sorted and stored in a marked bin to be disposed of at the municipal transfer facility.

Pollution of the development footprints (either through the leaking of chemicals such as oil and fuel, or through discarding of waste), as well as any areas adjacent to these footprints, should be monitored and avoided.

The Contractor shall provide adequate refuse bins at all eating areas and ensure that they are used. Bins are to be cleared on a daily basis.

4.2.3 Maintenance of equipment

All mechanical equipment and work vehicles which may be kept on site are to be stored, serviced and refuelled only at designated areas within the Contractor's Camp. Within these areas drip trays and other impervious materials, for example plastic or metal sheeting are to be used to prevent contamination of the ground in any way.

The RE or ECO may order the removal of equipment that is causing continual environmental damage by leaking oil or diesel for example, until such equipment has been repaired.

4.2.4 Topsoil Removal and Stockpiling

Management of Topsoil is the responsibility of the Owner and should be re-used on the farm.

Designate stockpile locations at least 50 metres away from any watercourses or wetland areas.

Where services are to be installed, topsoil is to be removed from the work areas, stockpiled separately from subsoil, and must be stabilised within a day of stockpiling. Stockpiles should be convex at the top to promote run- off, so that water is not able to accumulate and result in leaching of nutrients from the soil.

4.2.5 Stormwater and Erosion Control/Management

The operator/farm manager, as part of a stormwater management plan, will construct stormwater swales along access roads. These will be designed to accumulate runoff in designated dry pans to prevent stormwater run-off.

Construction activities directly involving freshwater features (i.e., road and pipeline crossings) should preferably be scheduled during the dry summer months—typically from December to March—when rainfall and runoff are at their lowest.

If any flow is present within the streams during construction, appropriate measures must be taken to divert the water around the work area and ensure its release downstream. Temporary diversion structures should be implemented to reroute stream and wetland flow around the active work area, ensuring that low flows remain uninterrupted throughout the construction period.

Temporary silt fencing, sandbags, or berms should be installed within downstream channels to prevent sediment generated during construction from entering downstream freshwater features.

Prevent contaminated runoff from construction sites from entering adjacent streams or wetlands by using diversion drains and berms. Temporary detention basins or sediment traps should be constructed to capture excess sediment before it reaches wetland or stream areas.

Silt traps must be installed at any stormwater release areas and energy dissipating structures to ensure that erosion of the area does not occur.

Care must be taken at all times to prevent erosion of soils on the construction site. Should any erosion be detected on site, the ECO, RE or Site Manager must identify the cause of such erosion and ensure that the most appropriate method of mitigation or stabilisation is employed as soon as possible.

4.2.6 Dust Control

Areas where dust will impact on neighbouring properties should be cleared during low wind conditions to avoid dust impact. Minimise area to be cleared around each unit and clear land areas in phases as required to minimize unnecessary exposure of bare ground.

Establish planted pastures between units and boundary landscaping to assist in shielding dust blowing onto roads and adjacent land users.

A suitable speed limit (20-40km/h) must be enforced on all access roads.

All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geotextile or hessian sheeting) to prevent dust generation that could potentially result in vegetation smothering.

Suitable dust suppression techniques must be utilised. Regularly wet down exposed soils, haul roads and/ or stockpiles using water trucks or sprinklers (but AVOID water logging and run-off). Water can be obtained from the existing Dams on site in this regard.

4.2.7 Earth Shaping

Any major earth works are to be restricted to the site boundaries. Bulldozer and heavy machinery operations are to be under constant supervision and must be aware of all the environmental obligations and penalties for transgressions, as they have the potential to inflict severe damage to the surrounding environment.

The use and excessive movement of heavy machinery should be avoided in particularly sensitive areas with great environmental value, or high erosion potential.

4.2.8 Construction Traffic Management

Movement of all construction vehicles on site is to be strictly limited to existing/ approved haul and access routes at all times. Should deviation from these routes be necessary for any reason, this is to be with approval of the ECO who is to ensure that no significant environmental damage results. No indiscriminate movement of vehicles through the freshwater ecosystems may be permitted.

Vehicles must be regularly inspected for leaks and be refuelled on sealed surfaces to prevent ingress into soils. All spills are to be immediately cleaned up and must be treated accordingly. Dedicated parking area for construction vehicles must be located away from sensitive areas, and drip trays must be located beneath any leaking equipment and lubricant/fuel absorbing media (moss/peat type products) within drip trays must be used to contain spilled material.

4.2.9 Site Clean Up/ Rehabilitation

The Contractor must ensure that all structures, equipment materials and facilities used on site are removed once the project has been completed. The construction site shall be cleared and cleaned to the satisfaction of the ECO.

All wetland/stream areas disturbed during construction must be rehabilitated and revegetated with appropriate indigenous wetland and riparian buffer species once construction is complete.

The ECO, in consultation with the Freshwater Specialist, will ensure that appropriate rehabilitation has been undertaken once the coffer dam associated with the suspended bridge has been removed.

4.2.10 Alien Clearing

Invasive alien plants/ trees are to be removed and treated according to standard alien control methods.

According to Regulation 15E of the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) Regulations: Where category 1, 2 or 3 plants occur contrary to the provisions of these regulations, a land user shall control such plants by means of one or more of the following methods of control as is appropriate for the species concerned and the ecosystem in which it occurs:

a. *Uprooting, felling, cutting ~~or burning~~;*

b. Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer;
c. Biological control carried out in accordance with the stipulations of the Agricultural Pests Act, 1983 (Act No. 36 of 1983), the Environment Conservation Act, 1989 (Act No. 73 of 1989) and any other applicable legislation;
d. Any other method of treatment recognised by the executive officer that has as its object the control of the plants concerned, subject to the provisions of sub-regulation (4);
e. A combination of one or more of the methods prescribed in paragraphs (a), (b), (c), and (d), save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.

Alien vegetation, specifically invasive and pioneer species which may find a niche to encroach disturbed areas, must be monitored and controlled.

Please refer to **Annexure 5: A Practical Guide to Managing Invasive Alien Plants, WWF**.

4.2.11 Fire Prevention/ Management

The Contractor/Farm Manger shall ensure that basic fire-fighting equipment is available at all 'construction' areas and facilities. The workforce should be appropriately trained in the use of all equipment. Fire beaters and "bakkie sakkie" are to be kept on site, and easily accessible at all times, and not locked away.

Smoking shall not be permitted in areas where it is a fire hazard. Such areas shall include any workshop and fuel storage areas and areas where the vegetation or other material may promote the rapid spread of an initial flame. A fire extinguisher of the appropriate type must be present when welding or other "hot" activities are undertaken.

Any work that requires the use of fire or open flame may only take place at a designated area approved by the Farm Manager and must be supervised at all times. Serviced fire-fighting equipment shall be available.

4.2.12 Environmental Control Sheets:

A. Communications

TASK	MITIGATION AND ENVIRONMENTAL CONTROLS	ACTION
Site Diary and Site Instruction Book	• To be updated on a regular basis	ECO, Farm Manager
Public complaints	• To be recorded, along with records of responses to them in the Site Diary	ECO/Farm Manager
Environmental Awareness/ Education	• Each contractor team to attend a training session prior to commencing work on site Record of members attending training sessions to be kept and updated regularly	ECO
Method Statements	• Method statements to indicate: What, How, Where and When activities are to take place. • Method statements for each relevant activity to be submitted to ECO prior to the start of that activity on site. • Work is not to commence until method statement approved by ECO and Site Manager if necessary.	Contractor/ Farm Manager
Pre-Construction and Planning Implementation	• Programming of construction events • By-laws and Regulations • Protection of Sensitive Features • Emergency, Safety and Fire control • Waste, Waster & Energy Guidelines • Design requirements	Contractor/ Farm Manager/ECO

COMMENTS/ UPDATE

RECORD OF PERFORMANCE

Acceptable		Details of Transgression	Responsible Party	Action Taken	Date
Yes	No				

B. Site Preparation

TASK	MITIGATION AND ENVIRONMENTAL CONTROLS	ACTION
Site definition	• Prior to any works commencing on site a site survey is to be undertaken and the placement of boundary pegs (i.e. white stakes) along the areas proposed for development activities are to be erected. Peg coding is to be communicated to the Contractor and all other relevant parties as they may be identified. The approved new development footprints on site must be surveyed and demarcated prior to any site development or vegetation loss (refer to Section C & D below). Areas beyond the white stakes are to be considered no-go areas. All areas outside the boundary of the property are naturally considered no-go areas and boundary fencing is to be secured in areas where work is to take place. • All 'fencing' is to be erected prior to construction works commencing on site and is to remain in position and in good repair for the duration of the construction phase. Once this has been done, all works, including stockpiling of construction materials are to be strictly confined to the demarcated area. • All footprint areas must remain as small as possible and vegetation clearing to be limited to the approved development footprint. Implement a phased clearing approach, limiting vegetation clearance to areas required for active construction only. • Work within the stream channels should be limited strictly to essential areas. Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted. • Suspended Bridge: The ECO, in consultation with the Freshwater Specialist and Engineer, will confirm the exact position of the temporary coffer dam.	ECO
Sensitive features	•Sensitive areas within the development area, as identified by the ECO, should be fenced off prior to the start of construction on site (where applicable), to ensure minimum disturbance to these areas during construction activities. Any required buffer areas or no-go areas should be marked prior to the start of construction on site and communicated to the Site Manager.	Surveyor/Contractor/ ECO
Vegetation	•All protected elements/areas located on the site, will be clearly marked, and care should be taken by the ECO to ensure that they are not unnecessarily disturbed during construction works on site. All alien vegetation must be removed according to standard legislated alien clearing methods. •Apart from the vegetation identified by the project team for removal from the site prior, no indigenous vegetation is to be removed without the written permission of the ECO during the construction phase. Damage to the indigenous vegetation anywhere on the site (outside of the approved area) will be subject to penalties. •Avoid unnecessary trampling of vegetation irrespective of the vegetation being associated with wetland habitats or the surrounding terrestrial area. Retain as much indigenous vegetation as possible (wetland and terrestrial).	
Rivers, Riparian Habitat & Wetlands	•Construction activities directly involving freshwater features (i.e., road and pipeline crossings) should preferably be scheduled during the dry summer months—typically from December to March—when rainfall and runoff are at their lowest.	

	• A buffer zone extending 6 meters upstream and downstream of the construction footprint should be clearly demarcated. No disturbance or activity should occur beyond these designated areas within the stream channel. The boundaries of this buffer zone must be physically demarcated using high-visibility fencing or flagging prior to the commencement of any construction activities. • Work within the stream channels should be limited strictly to essential areas. • Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted. • No pollutants must be allowed to enter any river system or any other ecologically sensitive areas during the construction phase. No waste or foreign materials may be dumped into streams or wetlands. These areas must also not be used for cleaning clothing, tools, or equipment.	
<u>Reptiles, birdlife and mammals</u>	• Due to the fact that there are vegetated areas next to the site reptiles, birdlife and mammals occur and move through the system. Any living organism needs to be respected during the construction phase and should not be killed or ran over. Every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). These animals should be relocated to a suitable habitat area immediately outside the project footprint (in the adjoining natural habitats of the site), but under no circumstance to an area further away. • No illegal hunting (either through illegal methods or of rare or threatened species) should be allowed on the site.	
<u>Archaeological remains</u>	• If any heritage remains are found Heritage Western Cape (HWC) needs to be informed. If heritage remains are disturbed it should be left and demarcated for inspection by HWC. • If any archaeological remains (including but not limited to fossil bones and shells, coins, ceramics, antique, marine shell heaps, stone artefacts and bone remains) are discovered HWC need to be notified. • If any graves or human remains are discovered HWC need to be notified.	
Vegetation clearance	• Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted. • Implement a phased clearing approach, limiting vegetation clearance to areas required for active construction only to prevent unnecessary exposure of bare ground (vulnerable to erosion). Establish pastureland and boundary landscaping as soon as possible after clearing. • Vegetation to be removed from the site to facilitate development needs to be identified by the ECO, indicated on a site plan and clearly marked prior to any other works on site. Alien vegetation directly adjacent or in close proximity to the construction area should be removed in line with alien clearing methods. • No vegetation may be removed using fires, and no excess vegetation material may be burned on site. No natural vegetation outside of the site may be removed without approval of the ECO, apart from invasive plant species which are to be removed according to a controlled program.	ECO/ Contractor

Contractor's Camp	• Once all vegetation clearing is complete, all vegetation and any removed excess material must be disposed of at a licensed refuse facility and may not be mulched or burned on site (unless all approvals have been obtained). • As the property is already operating as a working farm the contractors camp would be in line with the current area (Farmyard) being utilised for the purposes of equipment storage and maintenance etc.	ECO/ Contractor
Toilet Facilities	• Suitable sanitary facilities must be provided by the contractor for all staff on site. • Chemical Toilet facilities must not be located within 100 metres of any stream or wetland areas • Toilets should be located where their use would result in minimal impact on the surrounding environment and may not be in areas of running or standing water during winter and must be secured to prevent them from blowing over.	ECO/ Contractor
Noise Management	•The contractor must take appropriate measures to limit the impact of unreasonable noise from construction activities on the neighbouring land users. •Restrict working hours to weekdays and half day Saturday. No work (apart from vital tasks) on Sundays and public holidays. Create awareness on site of workers to keep noise levels down outside of working hours. •All transport vehicles and machinery/equipment used onsite must be regularly maintained and kept in good working order to prevent excessive noise.	ECO/ Contractor

COMMENTS/ UPDATE

RECORD OF PERFORMANCE

Acceptable		**Details of Transgression**	**Responsible Party**	**Action Taken**	**Date**
Yes	**No**				

C. Site Procedures

TASK	MITIGATION AND ENVIRONMENTAL CONTROLS	ACTION
Toilet facilities	• Where chemical toilets are provided, the Contractor should ensure that they are kept in hygienic condition and emptied on a regular basis. Waste from the toilets should be disposed of to the satisfaction of the ECO. • Care must be taken that no spillage occurs when chemical toilets are cleaned, and their contents are properly stored and removed off site. A contingency plan for spills must be supplied by the contractor and approved by the ECO.	Contractor/ Farm Manager
Fire control	• Required fire-fighting equipment is available on site, and in working order. • The workforce should be appropriately trained in the use of all equipment. Fire beaters and "bakkie sakkie" are to be kept on site, and easily accessible at all times, and not locked away. • Smoking shall not be permitted in areas where it is a fire hazard. Such areas shall include any workshop and fuel storage areas and areas where the vegetation or other material may promote the rapid spread of an initial flame. A fire extinguisher of the appropriate type must be present when welding or other "hot" activities are undertaken. • Any work that requires the use of fire or open flame may only take place at a designated area approved by the Farm Manager and must be supervised at all times. Serviced fire-fighting equipment shall be available.	Contractor/ Farm Manager
Material handling and storage	• Fuels and hazardous materials to be stored in suitably equipped storage areas in the Contractor's camp. These areas shall comply with fire safety requirements. • Impervious materials are to be used to prevent contamination of the ground in the event of spillages or leaks. Immediately clean any accidental oil or fuel spills or leaks. Do not hose or wash spills into the surrounding natural environment. • Bulk fuel depots are to be placed within hardened bunded areas. Bunds are to have a holding capacity equal to 110% of the largest fuel container. The Contractor is to ensure that he is aware of the effects of all substances on staff and the environment, with the correct action to take in the case of any incident involving these materials. • Contractor laydown areas, vehicle re-fuelling areas, stockpiles and material storage facilities to remain outside of all no-go / sensitive areas. A designated contractor laydown area must be approved by the Environmental Control Officer (ECO) prior to use. • Site clearing activities (including for contractor laydown areas) are to remain within the authorised footprint and vegetation clearing is to be limited to what is essential within that active footprint. • All operations involving the use of cement and concrete (outside of the batching plant) must be carefully controlled. Limit cement and concrete mixing to designated sites wherever possible.	Contractor
Waste management	• Management of overburden generated during the construction phase is the responsibility of the Contractor/Owner. Overburden to be re-used as fill for roads on the farm. • The Contractor will be responsible for materials to be re-used on site or removed to a Municipal Transfer Facility and for materials to be disposed	Contractor/ ECO

	of at the municipal landfill site. Management of building material to be sold to the building industry will be the responsibility of the Contractor/Owner. • The Contractor must establish a waste management system acceptable to the ECO for control during execution of the works. • Refuse refers to all construction debris (cement bags, rubble, timber, cans, nails, wire, spilt bitumen, glass, packaging, plastic, organic matter, etc.). Refuse generated during the execution phase of the works should be stored in an appropriate area on site, protected against wind dispersion and removed on a regular basis for disposal of at a permitted disposal site. No burning or burying of refuse on site should be allowed. Refuse bins must be watertight and wind-proof. Materials suitable for recycling to be sorted and stored in a marked bin to be disposed of at the municipal transfer facility. • Pollution of the development footprints (either through the leaking of chemicals such as oil and fuel, or through discarding of waste), as well as any areas adjacent to these footprints, should be monitored and avoided. • The Contractor shall provide adequate refuse bins at all eating areas and ensure that they are used. Bins are to be cleared on a daily basis.	
Maintenance of equipment	• All mechanical equipment and work vehicles to be stored serviced and refuelled at designated areas in the contractor's camp. • Drip trays or impervious materials to be used to prevent contamination of ground. • The RE or ECO may order the removal of equipment that is causing continual environmental damage by leaking oil or diesel for example, until such equipment has been repaired.	Contractor
Topsoil Removal and Stockpiling	• Management of Topsoil is the responsibility of the Owner and should be re-used on the farm. • Designate stockpile locations at least 50 metres away from any watercourses or wetland areas. • Where services are to be installed, topsoil is to be removed from the work areas, stockpiled separately from subsoil, and must be stabilised within a day of stockpiling. Stockpiles should be convex at the top to promote run- off, so that water is not able to accumulate and result in leaching of nutrients from the soil.	Contractor/ ECO
Stormwater and Erosion Control/ management	• The operator/farmer may need to maintain contour furrows or construct berms or similar control measures to prevent stormwater washing soil from ploughed areas. • Construction activities directly involving freshwater features (i.e., road and pipeline crossings) should preferably be scheduled during the dry summer months—typically from December to March—when rainfall and runoff are at their lowest. • If any flow is present within the streams during construction, appropriate measures must be taken to divert the water around the work area and ensure its release downstream. Temporary diversion structures should be implemented to reroute stream and wetland flow around the active work area, ensuring that low flows remain uninterrupted throughout the construction period.	Contractor/ ECO/ Farm Manager

	• Temporary silt fencing, sandbags, or berms should be installed within downstream channels to prevent sediment generated during construction from entering downstream freshwater features. • Prevent contaminated runoff from construction sites from entering adjacent streams or wetlands by using diversion drains and berms. Temporary detention basins or sediment traps should be constructed to capture excess sediment before it reaches wetland or stream areas. • Silt traps must be installed at any stormwater release areas and energy dissipating structures to ensure that erosion of the area does not occur. • Care must be taken at all times to prevent erosion of soils on the construction site. Should any erosion be detected on site, the ECO, RE or Site Manager must identify the cause of such erosion and ensure that the most appropriate method of mitigation or stabilisation is employed as soon as possible.	
Dust control	• Areas where dust will impact on neighbouring properties should be cleared during low wind conditions to avoid dust impact. Minimise area to be cleared around each unit and clear land areas in phases as required to minimize unnecessary exposure of bare ground. • Establish planted pastures between units and boundary landscaping to assist in shielding dust blowing onto roads and adjacent land users. • A suitable speed limit (20-40km/h) must be enforced on all access roads. • All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geotextile or hessian sheeting) to prevent dust generation that could potentially result in vegetation smothering. • Suitable dust suppression techniques must be utilised. Regularly wet down exposed soils, haul roads and/ or stockpiles using water trucks or sprinklers (but AVOID water logging and run-off). Water can be obtained from the existing Dams on site in this regard.	Contractor/ ECO
Earth Shaping	• Any major earth works are to be restricted to the site boundaries. Bulldozer and heavy machinery operations are to be under constant supervision and must be aware of all the environmental obligations and penalties for transgressions, as they have the potential to inflict severe damage to the surrounding environment. • The use and excessive movement of heavy machinery should be avoided in particularly sensitive areas with great environmental value, or high erosion potential.	Contractor
Construction traffic management	• Movement of all construction vehicles on site is to be strictly limited to existing/ approved haul and access routes at all times. Should deviation from these routes be necessary for any reason, this is to be with approval of the ECO who is to ensure that no significant environmental damage results. No indiscriminate movement of vehicles through the freshwater ecosystems may be permitted. • Vehicles must be regularly inspected for leaks and be refuelled on sealed surfaces to prevent ingress into soils. All spills are to be immediately cleaned up and must be treated accordingly. Dedicated parking area for construction vehicles must be located away from sensitive areas, and drip trays must be located beneath any leaking equipment and lubricant/fuel	Contractor/ ECO

	absorbing media (moss/peat type products) within drip trays must be used to contain spilled material.	
Site Clean up / Rehabilitation	• All structures, equipment materials and facilities are to be removed from site on completion of the project. • Construction site shall be cleared and cleaned to the ECO's satisfaction. • All wetland/stream areas disturbed during construction must be rehabilitated and revegetated with appropriate indigenous wetland and riparian buffer species once construction is complete. • Suspended Bridge: The ECO, in consultation with the Freshwater Specialist and Engineer, will ensure that appropriate rehabilitation of the area has been undertaken once the coffer dam has been removed.	Contractor/ ECO
Alien Clearing	• Invasive alien plants/ trees are to be removed and treated according to standard alien control methods (**Annexure 5**: A Practical Guide to Managing Invasive Alien Plants, WWF.)	Farm Manager
TASK	**MITIGATION AND ENVIRONMENTAL CONTROLS**	**ACTION**
COMMENTS/ UPDATE		

RECORD OF PERFORMANCE

Acceptable		**Details of Transgression**	**Responsible Party**	**Action Taken**	**Date**
Yes	**No**				

4.3 Operational Management Plan

The Basic Assessment identified various issues and concerns that were addressed through the process. Many of the issues need to be mitigated by management procedures and therefore goals need to be set to ensure implementation of these measures during the operational phase. Management activities are described to achieve the objectives together with monitoring and target criteria.

4.3.1 Components of Operational Management

- Goals: The key environmental goals are set for the operation of the development
- Objectives: These are set to meet the goals.
- Risk: If the goal is not achieved.
- Actions: Measures put in place to achieve objectives.
- Monitoring: To check if the objectives are achieved.
- Targets: Indicators of the effectiveness of the programme.
- Remedial Action: If targets are not met.

4.3.2 Daily Operations

Measures pointed out below should be integrated in the operation of the chicken rearing facility daily:

Water will be supplied from an existing registered source (BH1 and BH2). The water from the source should be managed according to water saving principles identified in **Goal 5: Sustainable Energy and Water Efficiency** below. Through the water saving mechanisms the load on the general sewage flow will also be reduced and therefore limit the load on the existing and proposed sewage system.

Electricity is currently being supplied by Eskom (notified max demand 100KVA) but will largely be supplemented with solar energy**.** Energy saving mechanisms should be implemented in accordance with **Goal 5: Sustainable Energy and Water Efficiency** below.

Material used in the life-cycle of the project should be focused on renewable and recyclable elements as per **Goal 4: Waste Management**.

Waste management as per **Goal 4** addressing General Waste, Manure and Mortalities (Hazardous and Non-Hazardous) must be implemented daily.

NOTE: PRACTICE SPECIFIC OPERATIONAL REGULATIONS AND GUIDELINES FOR OPERATION OF CHICKEN REARING FARMS IN SOUTH AFRICA SHOULD BE ADHERED TO AT ALL TIMES.

Operational Bio-security Guidelines
This should focus on mechanisms that need to be implemented by the landowners.

Mortalities
- Mortalities will be placed in the refrigerated unit on site for removal from site.

Disposal of Infectious carcasses / Disease Outbreak Procedure

- If a notifiable disease is detected (List of controlled and notifiable animal diseases in terms of the animal diseases Act, 1984 (Act No 35 of 1984)), waste and carcasses must be removed under the strict supervision of the state.
- If any form of disease challenge becomes evident in any of the chicken Houses, Management to contact the consulting veterinarian to advise him of the situation, what the symptoms are and the level of mortalities are being experienced
- If necessary, take samples of live birds and mortalities to an accredited laboratory for analysis to get specific results on the disease.
- If required the veterinarian will prescribe an appropriate medication treatment programme to address the problem – the ERFC forms regarding the approvals to use medication, the dosages and relevant withdrawal periods to be completed accordingly.
- All bio-security measures to be even more strictly enforced to prevent the spread of the problem between Houses – visitors to the farm shall not be permitted unless deemed absolutely necessary.
- Movement of personnel between the Houses to be minimised in order to prevent the spread of diseases to other Houses – if necessary, the affected House to be quarantined completely.

Planning

Planning will entail:

- Operational logistics and improvement of the various operational techniques.
- Preparation and finalisation of time schedules for production.
- Implementation of the Environmental Management Programme (this document).

Training

- All contractors (including workers) and/or any other persons directly involved in any forms of activity or actions related to the project will be trained in basic on-site environmental management before being permitted on site.
- An ECO may be present on site to advise and monitor all activities and actions taking place.
- Training is to be an ongoing process to ensure that contractors and new staff are familiar with the general environmental status of the site.
- Responsibilities for mitigation and monitoring actions should be clearly defined.
- These responsibilities will be delegated by management to the workers.

Bio-security

- Bio-security is standard procedure at any chicken rearing farm facility, in order to avoid the outbreak and spread of possible avian diseases.
- Standard procedures include the screening and washing of staff, vehicles and machinery.
- Bio-security measures specific to the chicken rearing facility should be implemented at all times, staff should be aware of all requirements and the bio-security of the farm should be monitored continuously.
- Bio-security should be strictly monitored at all times.

Environmental Monitoring:

The implementation of regular monitoring will ensure that environmental impacts can be detected early and remedial action implemented.

The following needs to be monitored on a weekly basis:

- Removal of manure from site;
- Pen cleaning procedures;
- The water source and watercourses on site (drainage lines);
- Landscaping and soil conditions;

The above listed categories need to be linked to evaluate if the one triggers the other.

Indicators which need to be measured:

Manure supply and cleaning procedures in permanent chicken houses

- Removed from pen and collected by farmers
- No composting or long-term storage on site
- If re-used it needs to be in line with the provisions of NEM: WA
- Wash down procedures and water amount control.

Groundwater Management Plan

Landscape and soil conditions

- Planting tempo
- Growth evaluation
- Visual evaluation

Schedules and Reporting

Each of the above components needs to be evaluated and a schedule must be drafted by management with the following headings:

- Timing
- Frequency
- Duration of Mitigation
- Progress
- Results of mitigation

4.3.3 Goals (Management Outcomes and Actions):

GOAL 1: PROTECTION OF SENSITIVE AND SURROUNDING ENVIRONMENTS			
Objective	**Implement Bio-security measures** [Responsibility: Manager/ECO]		
Risk	**Actions**	**Monitoring**	**Targets**
Contamination of wild birds Contamination of chickens Pollution of Stormwater run-off	• Train all staff and contractors to ensure an understanding of bio-security measures • Set strict bio-security guidelines to be adhered to • Implement strict schedule and allow time for bio-security measures • Determine baseline for regarding cleanliness of chicken pens • Delegate responsibility to specific members of staff for aspects of bio-security • Remove manure every seven days from permanent chicken houses • Adhere to the Stormwater Management Plan (**Goal 7**)	• Monitor management's bio-security guidelines • Monitor staff training and actions • Monitor staff's adherence to bio-security measures • Monitor river to ensure that no pollution of water takes place	Ensure environmental health – for surrounding environment as well as for chickens Ensure that staff understands importance of bio-security measures.
Remedial Action	Owner to take immediate action against non-compliance Penalise individuals who do not comply to bio-security measures which have been implemented Deviation from job description must be dealt with in terms of contractual or employment terms of reference.		
Objective	**Safeguarding the Freshwater Ecosystems** [Responsibility: Owner/ Manager/ECO]		
Risk	**Actions**	**Monitoring**	**Targets**
-Loss of biodiversity, aquatic habitat and ecological structure.	• Management practices will include dry sweeping and the removal of manure, followed by high-pressure washing of broiler areas, with wash water directed into surrounding pastures. • In addition, as part of a stormwater management plan, the construction of stormwater swales along access roads is proposed, designed to accumulate runoff in designated dry pans.	All rehabilitated and revegetated areas within the wetland/stream areas should be monitored	Improved functioning of the freshwater ecosystems.

-Potential hydrology modification and change in sediment balance. -Potential Water Quality impacts.	• All wetland/stream areas disturbed during construction must be rehabilitated and revegetated with appropriate indigenous wetland and riparian buffer species once construction is complete. • Regular maintenance should be conducted to remove debris accumulation and control nuisance vegetation growth, to prevent blockages and ensure continued flow through culverts. • No use of machinery is allowed within any wetland/stream channels for the operational phase. • All debris must be removed and properly disposed of. • No dumping of debris should be allowed in the stream/wetland areas. • Any wetland/ riparian or instream areas disturbed by maintenance activities to be rehabilitated and revegetated (if necessary) after maintenance works. • Adhere to the Stormwater Management Plan (**Goal 7**)	for the following 2 years, ensuring the establishment of good plant biodiversity.	
Remedial Action	Non-compliance to be reported to the Applicant and the Competent Authority. Penalise individuals who deviate from the targets.		
Objective	**Alien vegetation management** [Responsibility: Owner/ Manager/ECO]		
Risk	**Actions**	**Monitoring**	**Targets**
-Loss of biodiversity -Alien overgrowth -Fire	• Clear all alien vegetation and new growth by means of pulling, cutting and approved herbicide. • No stockpiling of aliens after removal, it will increase fire risk. • Alien invasive vegetation management within the site must be done according to the guidelines in **Annexure 5**.	Monitor natural vegetation for Alien Invasives and ensure that no fire hazards are created by stockpiling alien vegetation.	Preservation of indigenous vegetation
Remedial Action	Non-compliance to be reported to Applicant and the Competent Authority		

Objective	**Faunal Management** [Responsibility: Owner/ECO]		
Risk	**Actions**	**Monitoring**	**Targets**
-Mobile species moving off the site if the site cannot support these species. -Wildlife suffers disturbance during operation.	• No feeding of wild animals. • No rubbish to be left out to attract scavengers. • Plant indigenous & endemic flora around chicken houses to increase on-site biodiversity. • Pest management is to be done under an integrated pest management programme where the use of chemicals is considered as a last option, and where these chemicals are placed in such a way where it does not lead to the accidental poisoning of non-target species. • No illegal hunting (either through illegal methods or of rare or threatened species) should be allowed on the site.	-faunal and avi-faunal species on site -littering -encroachment of development into sensitive areas -encroachment of alien vegetation	-To increase bio-diversity -Litter free site -No disturbance of fauna and flora -Ongoing Alien Management
Remedial Action	Non-compliance to be reported to Applicant and the Competent Authority Institute a litter collection programme Increase awareness of fauna and flora		

Objective	**Fire Management** [Responsibility: Owner/Manager]		
Risk	**Actions**	**Monitoring**	**Targets**
Impact on natural Fire Cycles Liability	• Ensure that basic serviced fire-fighting equipment is available at all times in areas in which work is being undertaken. The workforce must be appropriately trained in the use of all equipment. Fire beaters are to be kept on site, and easily accessible at all times, and not locked away. • Smoking shall not be permitted in areas where it is a fire hazard. Such areas shall include any workshop and fuel storage areas and areas where the vegetation or other material may promote the rapid spread of an initial flame. • A fire extinguisher of the appropriate type must be present when welding or other "hot" activities are undertaken. • Any work that requires the use of fire or open flame may only take place at a designated area approved by the Farm Manager and must be supervised at all times.	Contractor/ Farm Manger to ensure Fire Fighting Equipment are in place and serviced regularly. Be part of the Fire Protection Association programme	Zero liability
Remedial Action	Non-compliance to be reported to Applicant and the Competent Authority		

Objective	**Management of Agricultural Activities and Fertilizing** [Responsibility: Owner/Manager]		
Risk	**Actions**	**Monitoring**	**Targets**
Pollution and contamination	Pollution of the development footprints, as well as any areas adjacent to these footprints, should be monitored and avoided. Ensure fertiliser is utilised responsibly across the entire development site: • Develop and implement nutrient management plans that consider soil testing, crop nutrient requirements, and appropriate application rates to prevent over-application. • Avoid application of fertilisers prior to heavy rainfall events • Refrain from applying fertilizers on steep slopes to minimize the potential for runoff, especially during heavy rainfall events. • Correct application of the right fertiliser product in the right quantities and at the right time (as determined by crop needs) can minimize nutrient loss from agricultural fields. Implement water-wise irrigation practices such as drip irrigation and ensure that over-watering is avoided as this will minimise the generation of potentially contaminated agricultural runoff. Ensure that all nutrient enriched agricultural waste (e.g. manure) is suitably stored and utilized onsite or disposed offsite to prevent runoff contamination. The Applicant must adhere to standard "best practice" measures regarding the use, storage and disposal of any chemicals or fertilizers etc. required to undertake standard agricultural activities on site. Pest management is to be done under an integrated pest management programme where the use of chemicals is considered as a last option.	Monitor the effectiveness of methods used.	Efficient management and use of chemicals or fertilizers.
Remedial Action	Refer non- compliance to the Farm Manager/ Contractor.		

PERFORMANCE					
Acceptable Yes	**Acceptable Yes**	**Details of Transgression**	**Responsible Party**	**Action Taken**	**Date**

GOAL 2: TO ENSURE AESTHETIC APPEAL OF THE SITE AND REDUCE NUISANCE IMPACTS			
Objective	**Reduce nuisance impacts on neighbouring landowners** **Maintain a neat and well-organized working environment** [Responsibility: Owner/Operator]		
Risk	**Actions**	**Monitoring**	**Targets**
Inappropriate landscaping Development areas not properly screened Nuisance aspects	• No naked light sources should be visible from outside units, only reflected light to be visible • Lighting to be sufficient for safety and clarity of movement only • Only low voltage lights to be used. • Use earth tones or muted colours on buildings to reflect the local landscape. • Rows of indigenous and fast-growing trees will form part of the free-range areas for shade along the new structures, that will screen buildings from any visible receptors. • Use only indigenous/ endemic water wise plants • Establish and monitor planted pastures between units and boundary landscaping to shield dust blowing onto roads and adjacent land users. • A suitable speed limit (20-40km/h) must be enforced on all access roads. • Position noisy activities (e.g. vehicle loading) as far away from neighbouring activities and restrict during daytime hours only. • Keep machinery well maintained (e.g. generators, fans etc.) to reduce mechanical noise. • Install silencers/mufflers on ventilation fans and generators – where need be. • Suitable dust suppression techniques must be utilised. • Maintain all onsite roads in a good condition. • Removal of manure directly to suitable re-use location. • All manure must be covered during transport to neighbouring land users. • Maintain optimal house ventilation to prevent ammonia build-up • Mortalities (not infectious) must be transported in sealed containers. • Standard Biosecurity procedures to be followed. • Create awareness on site of workers to keep noise levels down.	• Monitor the success of the applicable landscaping • Regularly monitor roads for damage, dust or erosion and addressed immediately. • Monitor and keep a record of: -Manure -Mortalities • Monitor water use on site	Ensure effective screening of development Ensure optimal & effective water use Ensure landscaped areas act as buffers Ensure landscaped areas are alien free
Remedial Action	Owner to take immediate action against non-compliance.		

PERFORMANCE					
Acceptable Yes	Acceptable Yes	Details of Transgression	Responsible Party	Action Taken	Date

GOAL 3: MAINTENANCE ASPECTS AND SECURITY CHECKS.			
Objective	**Maintenance of water crossings** [Responsibility: Owner/Operator]		
Risk	**Actions**	**Monitoring**	**Targets**
Soil Erosion Flooding Infrastructure Damage Vegetation destruction	• All rehabilitated and revegetated areas within the wetland/stream areas should be monitored for the 2 years (post construction), ensuring the establishment of good plant biodiversity. • No use of machinery is allowed within any wetland/stream channels for the operational phase. • All debris must be removed and properly disposed of. • No dumping of debris should be allowed in the stream/wetland areas. • Any wetland/ riparian or instream areas disturbed by Maintenance activities to be rehabilitated and revegetated (if necessary) after maintenance works.	Monitoring of all stream crossings for signs of erosion, debris build-up or nuisance growth around the culverts.	Ensuring that regular maintenance takes place to prevent failure of the water crossing or disturbance to the surrounding area.
Remedial Action	Owner to take immediate action against non-compliance.		
Objective	**Security Control** [Responsibility: Owner/Operator]		
Risk	**Actions**	**Monitoring**	**Targets**
Security breach & Safety of Property Owners	• Limit site access to authorised personnel only. • Use a single entry and exist point to monitor movements. • Limit staff movement to work related areas only. Install clear signage marking no-go areas for workers. • Maintain secure perimeter fencing to prevent unauthorised entry. • Manage traffic safety on farm access roads especially for larger trucks. • Minimise unnecessary traffic movement during early mornings and late evenings. • Implement strict bio-security measures. • Implement a strict Code of Conduct for all employees and contractors (incl. noise, littering, trespassing and respect of neighbouring properties). • Enforce rules against playing loud music, shouting or using offensive language on site. • Provide adequate on-site rest areas, toilets and eating spaces so workers don't need to use roadside or neighbouring land.	Monitoring perimeter fencing, access and traffic management. Appoint a site supervisor responsible for monitoring employee conduct. Particularly near sensitive boundaries. Keep a log of any complaints received and action taken.	Ensuring that regular maintenance takes place to prevent Safety and Security Risks.

	• Ensure waste bins are available and emptied regularly to prevent litter blowing onto adjacent properties.		
Remedial Action	Owner to take immediate action against non-compliance.		

PERFORMANCE					
Acceptable Yes	**Acceptable Yes**	**Details of Transgression**	**Responsible Party**	**Action Taken**	**Date**

GOAL 4: WASTE MANAGEMENT			
Objective	**Reduce, Reuse, Recycle Waste** **Good Waste Management Practices** [Responsibility: Owner/Operator]		
Risk	**Actions**	**Monitoring**	**Targets**
Irresponsible waste management Unsightly and smell Attraction of pests Biosecurity Risk Litter and wasteful use of resources.	<u>Mortalities (Non-Hazardous):</u> • All daily mortalities will be collected out of the units by farm staff. Mortalities will be assessed and counted. A register containing information on possible cause of death, number and mass of mortalities should be kept. Bio-security and optimum hygiene practices should be applied throughout the daily collection process and all the containers and instruments used to transfer deceased birds should be washed and disinfected after use. Mortalities will be placed in plastic bags and removed to the refrigerated container at the entrance to the farm. A licensed and registered waste service provider will remove the frozen mortalities on a bi-weekly basis or as required. <u>General:</u> • All standard refuse from the operation to be contained and removed from site weekly and disposed of at the nearest municipal Landfill Site. Recycling will be in place on site. • All standard refuse to be sorted according to accepted municipal standards. • Onsite bins for different wastes to be provided, which will encourage sorting at the source. • No dumping of ANY waste (e.g. cement, alien vegetation, soil, domestic waste etc.) within aquatic ecosystems). • No burning or burying of waste on site • Methods to reduce, reuse and recycle waste need to be encouraged through all aspects of the development. • Aim for and promote Zero Waste in the operation, management and maintenance of all buildings. Zero Waste emulates the closed loop processes found in nature, taking a 'cradle –to –cradle' approach to designing products and buildings. • Build waste avoidance into the process at a design phase, by specifying products and materials that have less wasteful production processes and don't create wasteful emissions during construction and maintenance of a building.	Check operational components if recycling is followed Monitor the level and effectiveness of Waste Management within the property.	Recycling to be actively implemented by the owner, manager and staff Aim for Zero Waste in the life-cycle of the development.

	• If waste is created, consider how this can firstly be re-used and then recycled to recover the value invested in these materials, rather than losing this value when the resource is dumped in a landfill or incinerated. • Material used during the life-cycle of the project should be focused on renewable and recyclable elements: - Select building materials for durability to minimise maintenance or replacement; - Use standard materials to increase the potential for re-use and re-cycling; - Materials should be sourced locally where possible; and - Use recycled material where possible. • Facilitate the separation of waste at the source for composting, re-use and recycling when designing waste management systems. People should be encouraged to recycle their household waste. Refer to the recycling image below and ensure people understand what can or cant be recycled. Refer to image below in terms of what CAN be recycled.		

Remedial Action	Non-compliance to be reported to Applicant and the Competent Authority Implement incentive programme for employees.

Objective	**Manage operational waste (manure)** [Responsibility: Owner]		
Risk	**Actions**	**Monitoring**	**Targets**
Unsightly Odour Attraction of pests	• All dry matter is to be swept from the permanent chicken houses every seven days. • All dry matter is to be removed from site and collected by neighbouring farmers as per contractual agreement. • No manure can be composted or stored on site. • If manure is used by the owner, it needs to be in line with provisions of NEM: WA.	Manure leaving the site should be monitored to ensure transportation is sufficiently covered and contained. Manure being utilised on the property as fertiliser must be kept on record regarding the amount and location distributed.	Prevent manure spilling onto roads and any nuisance complaints.
Remedial Action	Refer non- compliance to the owner and site operator/manager		
Objective	**Manage operational waste (hazardous mortalities)** [Responsibility: Owner/Operator - under strict guidance from the State Veterinarian]		
Risk	**Actions**	**Monitoring**	**Targets**
Biosecurity Risk	Should the farm detect any disease (List of controlled and notifiable animal diseases in terms of the animal diseases Act, 1984 (Act No 35 of 1984)), the bio-security procedure must be followed: • If any form of disease challenge becomes evident in any of the chicken Houses, Management to contact the consulting veterinarian to advise him of the situation, what the symptoms are and the level of mortalities are being experienced • If necessary, take samples of live birds and mortalities to an accredited laboratory for analysis to get specific results on the disease. • If required the veterinarian will prescribe an appropriate medication treatment programme to address the problem – the ERFC forms regarding the approvals to use medication, the dosages and relevant withdrawal periods to be completed accordingly.	Bio-security measures must be implemented at all times and staff should be aware of all requirements. Bio-security should be strictly monitored at all times.	Adhere to the Animal Diseases Act, 1984 and enforce all Biosecurity procedures.

	• All bio-security measures to be strictly enforced to prevent the spread of the problem between Houses. Visitors to the farm shall not be permitted unless deemed absolutely necessary. • Movement of personnel between the Houses to be minimised to prevent the spread of diseases to other Houses. If necessary, the affected House to be quarantined completely. • No infectious carcasses are allowed to be disposed of with general waste destined for the land-fill site. • Safe disposal certificates for hazardous waste removed from the facility will be kept on record for a minimum period of 5 years.	Standard procedures include the screening and washing of staff, vehicles and machinery.	
Remedial Action	Any non-compliance to be referred to Owner/state vet. NOTE: PRACTICE SPECIFIC OPERATIONAL REGULATIONS AND GUIDELINES FOR OPERATION OF CHICKEN REARING FARMS IN SOUTH AFRICA SHOULD BE ADHERED TO AT ALL TIMES.		

PERFORMANCE					
Acceptable Yes	**Acceptable Yes**	**Details of Transgression**	**Responsible Party**	**Action Taken**	**Date**

GOAL 5: SUSTAINABLE ENERGY AND WATER EFFICIENCY			
Objective	**A. Energy Efficiency** [Responsibility: Owner/ECO]		
Risk	**Actions**	**Monitoring**	**Targets**
Financial costs Load shedding Depletion of non-renewable resources	Reducing the energy consumption of a building not only saves the environment but will also save on the running costs of the building. By designing energy efficient or renewable energy options into a building, the demand for electricity during peak consumption times is reduced. The following Energy Efficiency Measures must be encouraged where possible: • All proposed and existing dwellings, agricultural water pumps etc. should be supplied with electricity generated on the farm by means of solar panels. • All dwellings are to be built/ renovated in accordance with the "*NHBRC Guidelines for Building an Energy Efficient Home*". • Install properly insulated ceilings. • Place and size windows to make optimal use of natural light, winter heating and ventilation without creating draughts, or gaining too much heat in summer or losing heat in winter. • Avoid the use of air conditioning or at least ensure that the correct size is installed and that use of the unit is minimised. Use air conditioners with a seasonal energy efficiency ratio of 10 or more (ratio of the seasonal energy output to the seasonal energy input). • Ensure that the building is constructed so as to be tightly sealed, to prevent unwanted air flows. Doors and windows must be appropriately sized and fitted with seals. • Energy efficient electrical installations must be used. • Ensure that artificial lighting is designed so that light is focused where necessary, such as brighter areas where tasks are being performed and more ambient light elsewhere. • Avoid the use of outdoor 'up-lighting' to reduce light pollution. • Ensure that energy efficient light bulbs, such as CFLs or LEDs, are used. • Reduce the electrical energy used to heat water by installation of solar water heaters, or at least geyser blankets, pipe insulation and a geyser timer. • Use proper insulation to reduce the need for air conditioning. • Solar glazing or energy efficient windows to reduce the need for air conditioning. • Maximise the use of solar heating where viable. • Structures should be orientated to optimise use of ambient weather and climate conditions for heating and cooling. • Programmed lighting.	Monitor the level and effectiveness of Green Energy utilised within the property.	Aim to be a fully self-sustaining, off the grid farming unit.

	• Cold rooms and freezers fitted with counter-weight doors to ensure that they cannot be left open unnecessarily. • Use of solar heating maximised where possible.		
Remedial Action	Replace any existing non energy efficiency equipment or infrastructure with energy efficient alternatives.		
Objective	**B. Sustainable Water Usage and Efficiency** [Responsibility: Owner/ECO]		
Risk	**Actions**	**Monitoring**	**Targets**
Wasting Water Soil Erosion Overloading of sewerage system	• Ensure that only water efficient devices such as low-flow taps, low-flow showerheads, washing machines and dishwashers are used. • Ensure that all toilets are low volume (9.5 litres or less), with dual-flush or multi-flush. • Ensure that outbuildings and outside taps and showers are fitted with metering tap buttons, which have set timers to prevent taps being left on or dripping. • Reduce hard surfacing to encourage rainwater to seep back into the ground. Design paved areas so that water run-off is slowed down and where possible use soak-aways and permeable paving that allows water to filter into the ground. • Ensure that the optimum pipe size and water pressure is used. A pressure reducing valve can be installed at a point nearest to where the supply enters the building to ensure that all water supplies in the building are balanced. • Ensure all dwellings & buildings are harvesting rainwater and encourage the re-use of grey water where appropriate. However, ensure that the local ecological system is not polluted and that it is managed correctly. • Ensure the use of indigenous planting and efficient irrigation methods, such as drip irrigation. • All hoses to be fitted with trigger gun spray nozzles to limit wastage. • Have timed irrigation systems with the focus on the hours when the least evaporation occurs; rain sensors to form part of the irrigation system. • Only plants adapted to the local climate used in landscaping to reduce the need for excessive watering. • Timed irrigation systems for pasture irrigation. • Taps around the farm fitted with locks to prevent unauthorised use and included on a maintenance schedule to detect and repairs leaks.	The level and effectiveness of Water Efficiency Measures implemented. Good practise dictates that the pumping rates, abstracted volumes, groundwater levels and groundwater quality be monitored to ensure that groundwater use remains within sustainable limits and to provide warning if the groundwater supply system were to fail.	Water use targets to be set according to water availability. Aim for Zero Waste in the life-cycle of the development. Refer to Water Use License.

	• Physical brushing or sweeping used in preference to water cleansing wherever possible (e.g. cleaning pathways and inside the units).				
Remedial Action	Replace any existing non water efficiency equipment or devices with water efficient alternatives. Water leaks, non-compliance to be reported to owner Increased awareness programme				
PERFORMANCE					
Acceptable Yes	**Acceptable Yes**	**Details of Transgression**	**Responsible Party**	**Action Taken**	**Date**

GOAL 6: EMERGENCY PREPAREDNESS AND RESPONSE MANAGEMENT		
Objective	**Effective containment and storage of fuel and other chemical/ hazardous substances.**	
Risk	**Actions & Monitoring:**	**Targets**
Potential impact on groundwater quality deterioration because of leaks from fuel storage and distribution. Liability Death	The diesel tank is above ground and bunded at a 110% capacity, to ensure no spillage, the filling area consists of a sealed concrete hardstand and drip tray on top. It is essential that the following **Emergency Plan** is implemented to ensure a quick response and attendance to the matter in case of a leakage, spillage, fire etc. Emergency Procedures are as follows: **1. General Safety Rules** – No smoking, flames, or sparks near the tank. – Keep the tank locked when not in use. – Ensure spill kit, fire extinguishers, and PPE are always nearby (location known to staff). – Emergency contact list must be visible at the tank. **2. In Case of a Fire** – Raise the alarm – shout for help and activate farm alarm if available. – Call Fire Department immediately – provide location and type of fire. – **Fire Department Emergency Number: 023 3422 430** If safe: – Shut off valves/pumps to stop fuel flow. – Use foam or dry chemical extinguisher for small fires only. – If fire is too large – evacuate to the farm assembly point. – Do not attempt to fight tank fires yourself once flames reach the fuel. **3. In Case of a Diesel Spill or Leak** – Stop source of leak – close valve or pump. Contain the spill: – Use the bunded area to keep diesel from spreading. – Deploy absorbent pads, booms, or soil to block flow. – Prevent diesel from entering drains, boreholes, streams, or soil. Clean up: – Use spill kit absorbents; place used material in sealed disposal bags. – Store contaminated soil/materials safely for disposal by a licensed waste company. – Report: Log incident in farm's environmental register and inform authorities if spill >200 L (as per NEMA regulations).	No leaks or groundwater contamination. Minimal damages associated with Emergency situations.

	4. In Case of Health Exposure – Inhalation: Move person to fresh air, keep warm, monitor breathing. – Skin contact: Wash thoroughly with soap and water. – Eye contact: Flush eyes with clean water for at least 15 min. – Ingestion: Do not induce vomiting; seek medical help immediately. **5. Evacuation Procedure** – Sound alarm and move all staff to the designated safe assembly point (e.g., farm shed or open field upwind of the tank). – Supervisor conducts head count. – No one re-enters until declared safe by emergency responders. **Preparedness/ Monitoring:** – Inspect tank, bund, and valves weekly for leaks/damage. – Keep extinguishers serviced and spill kits restocked. – Train staff annually on fire and spill response. – Keep access roads clear for emergency vehicles.	
Remedial Action	If a spillage or leakage event occurs, it should be reported to the relevant authorities and the necessary actions taken to contain the fuel and reduce any negative impact. Non-compliance to be reported.	

PERFORMANCE			
Date	**Details of Transgression**	**Responsible Party**	**Action Taken**

GOAL 7: STORM WATER MANAGEMENT			
Objective	**Successful implementation of the Stormwater Management Plan.**		
Risk	**Actions**	**Monitoring**	**Targets**
Erosion Pollution of Freshwater ecosystems	The Kleinfontein broiler facilities stormwater management plan revolves around the construction of vegetated stormwater swales along access roads, designed to accumulate any runoff in designated dry pans. Roads are shaped to push water off the surface, into a canal or stormwater swale. Swales will be vegetated and these help to trap run-off in general. These swales/canals then lead to small shallow detention ponds or more appropriately 'dry pans' considering the rate of evaporation and limited run-off (blue patches). Any overflow, if applicable, will then be directed into existing agricultural contours surrounding the site. The Stormwater Management Plan (**Annexure 6**) needs to be adhered too and is summarised below: - Dry-sweep pens, remove all manure and minimise usage of water inside units for washing. Units are to be washed by high pressure hoses (washing pumps) only once dry matter has been removed in order to eliminate any possible manure runoff. - Negligible runoff is caused by the 'washing' of the chicken houses. Any possible runoff will enter the vegetated free-range pastures located adjacent to the chicken houses where it dissipates. These areas will also contain trees which will assist with infiltration of any run-off. - During rain events runoff flows from free range areas (located adjacent to chicken houses) where it dissipates. Any remaining runoff then enters the existing/ proposed road network (further dissipation). - Run-off from the road will be directed into the vegetated stormwater swales proposed along the roads to the east and west of the chicken houses. - Any run-off from the swales will be directed into the proposed detention ponds/ dry pans. Any overflow, if applicable, will be directed into the existing agricultural contours surrounding the site. - Runoff will accumulate in the detention pond/ dry pans allowing any possible manure to settle before water flows into the existing agricultural contours. - The proposed stormwater management system will assist with dissipating & polishing runoff; and trapping any possible manure from the chicken houses to Ensure that no run-off from the units ends up in freshwater features. - No ingress of stormwater into the broiler units is to occur to protect runoff quality. - Contain all sweepings and dispose of to the relevant re-use location. - Implement erosion control measures, such as silt fences or erosion blankets along slopes, to prevent soil runoff, where applicable. - Refuelling or maintenance of vehicles may only take place on designated, bunded surfaces. - Maintain vegetation around the facility to enhance soil stability, minimize erosion, and provide natural filtration of any runoff.		Implementation of the stormwater management plan to ensure stormwater exiting the site does not pollute any natural ecosystems.

Remedial Action	If erosion has occurred, it must immediately be rehabilitated through stabilisation of embankments and revegetation, where applicable.		
PERFORMANCE			
Date	**Details of Transgression**	**Responsible Party**	**Action Taken**

GOAL 8: GROUNDWATER MANAGEMENT PLAN		
Objective	**Management of the groundwater abstraction.** [Responsibility: Owner/Operator]	
Risk	**Actions & Monitoring**	**Targets**
Groundwater quality deterioration as a result of over-abstraction. Depletion of the groundwater resource due to over-abstraction. Depletion of surface water due to abstraction from groundwater Groundwater contamination due to leaking wastewater from septic tanks	Boreholes must be tested for the parameters outlined in Table 2 which refers to the General Notice 169 of 2013, *Table 2.2: Monitoring requirements for domestic wastewater discharge*. The management of the groundwater abstraction includes the following recommendations: 1. It is recommended to maintain a constant and continuous pumping schedule as much as possible. Thus, should a daily volume of less than 319 680 L/d for KF_BH1 and 103 680 L/d for KF_BH2 be required. it is recommended to decrease the pumping rate and not the pumping duration. By pumping continuously instead of a stop-start schedule, iron oxidation in the borehole is minimised, decreasing the amount of iron precipitation inside the boreholes and pumps. 2. An "observation pipe" needs to be installed (32 mm inner diameter. class 10 - Figure 4 below) from the pump depth to the surface, closed at the bottom and slotted for the bottom 5 – 10 m, for the production borehole. This allows for a 'window' of access down the borehole which enables manual water level monitoring and can house an electronic water level logger. 3. Continuous monitoring of groundwater levels using pressure transducers in the borehole is ideal. The water level in the borehole may not drop below the critical water level (Table 3 below). If the water level in the borehole drops below the critical water level, abstraction must be immediately reduced by 10 %. Monitoring must continue and after 30 days, if the water level in the borehole does not recover to above the critical water level, abstraction must be reduced by a further 10%. This process must continue until the water level in the borehole is stable. 4. Water quality monitoring which includes sampling and analysis of the groundwater at an accredited laboratory, is important. A sampling interval of quarterly is recommended for the first year of monitoring; thereafter, the water quality monitoring should be reviewed and can potentially be reduced to annual as proposed in Table 4 below. 5. The monitoring data should be reviewed on quarterly basis for the first two years and can then be scaled down to bi-annually. 6. Installation of a sampling tap at the production borehole (to monitor water quality) is essential. 7. Installation of a flow volume meter at the production borehole (to monitor abstraction rates and volumes) is also important. External flow (e.g. mag-flow) meters are recommended. 8. Abstraction volumes must be monitored and recorded by a designated person on site. Depending on the frequency of use, daily, weekly or monthly abstraction should be recorded.	Sustainable use of groundwater and prevention of over-abstraction.

9. The appropriate borehole pump must be installed. i.e. not an over-sized pump that is choked with a gate valve. If the monitoring shows that more water can be abstracted, then the duration of pumping time can be increased (not the flow rate).
10. If required, the pump and borehole casing (and associated infrastructure) can be serviced annually and cleaned.
11. A geohydrologist should review the above information at least annually to ensure optimal groundwater abstraction and management occurs.
12. The relevant DWS monitoring officer (as specified in the Water Use Licence) should be informed if water levels are dropping to critical level or if any parameters, as specified in Table 4. Changes by 20%.

The groundwater abstraction should be reviewed to ensure that it is sustainable based on the monitoring data obtained.

Table 3: Borehole Abstraction Recommendations.

Borehole Details				
Borehole Name	**Latitude (DD)**	**Longitude (DD)**	**Borehole Depth (m)**	**Inner Diameter (mm)**
KF_BH1	-33.922230	19.385410	96.	150
KF_BH2	-33.922080°	19.388520°	163.00	210
Abstraction Recommendations				
Borehole Name	**Abstraction rate (L/s)**	**Abstraction Duration (hrs)**	**Recovery Duration (hrs)**	**Possible Volume Abstracted (L/d)**
KF_BH1	3.7	24	0	319 680
KF_BH2	1.2	24	0	103 680
			Total	**423 360**
Pump Installation Details				

Borehole Name	Pump Installation Depth (mbgl)	Critical Water Level (mbgl)	Dynamic Water Level (mbgl)*	Rest Water Level (mbgl)
KF_BH1	55.00	47.33	34.00	22.97
KF_BH2	115.00	110.80	77.00	5.31

* Typical water level expected during long-term production

Table 4: Proposed groundwater monitoring parameters.

Parameter	Frequency
Groundwater Level	Ideally every 15 minutes with a data logger
Chemical parameters	
pH (at 25 °C)	Quarterly (Field Chemistry)
Conductivity (mS/m) (at 25 °C)	Quarterly (Field Chemistry)
Total Dissolved Solids (mg/L)	Quarterly (Field Chemistry)
Turbidity (NTU)	Quarterly*
Colour (mg/L as Pt)	Quarterly*
Sodium (mg/L as Na)	Quarterly*
Potassium (mg/L as K)	Quarterly*
Magnesium (mg/L as Mg)	Quarterly*
Calcium (mg/L as Ca)	Quarterly*
Chloride (mg/L as Cl)	Quarterly*
Sulphate (mg/L as SO_4)	Quarterly*
Nitrate & Nitrite Nitrogen (as a ratio)	Quarterly*
Nitrate Nitrogen (mg/L as N)	Quarterly*
Nitrite Nitrogen (mg/L as N)	Quarterly*
Ammonia Nitrogen (mg/L as N)	Quarterly*
Total Alkalinity (mg/L as $CaCO_3$)	Quarterly*

		Total Hardness (mg/L as $CaCO_3$)	Quarterly*
		Fluoride (mg/L as F)	Quarterly*
		Aluminium (mg/L as Al)	Quarterly*
		Total Chromium (mg/L as Cr)	Quarterly*
		Manganese (mg/L as Mn)	Quarterly*
		Iron (mg/L as Fe)	Quarterly*
		Nickel (mg/L as Ni)	Quarterly*
		Copper (mg/L as Cu)	Quarterly*
		Zinc (mg/L as Zn)	Quarterly*
		Arsenic (mg/L as As)	Quarterly*
		Selenium (mg/L as Se)	Quarterly*
		Cadmium (mg/L as Cd)	Quarterly*
		Antimony (mg/L as Sb)	Quarterly*
		Mercury (mg/L as Hg)	Quarterly*
		Lead (mg/L as Pb)	Quarterly*
		Uranium (mg/L as U)	Quarterly*
		Cyanide (mg/L as CN^-)	Quarterly*
		Total Organic Carbon (mg/L as C)	Quarterly*
		E.coli (count per 100 ml)	Quarterly*
		Total Coliform Bacteria (count per 100 ml)	Quarterly*
		Heterotrophic Plate Count (count per ml)	Quarterly*
		Total Petroleum Hydrocarbons (TPH)	Quarterly*
		*Quarterly for first year, can be reduced to annual if reviewed and deemed appropriate	

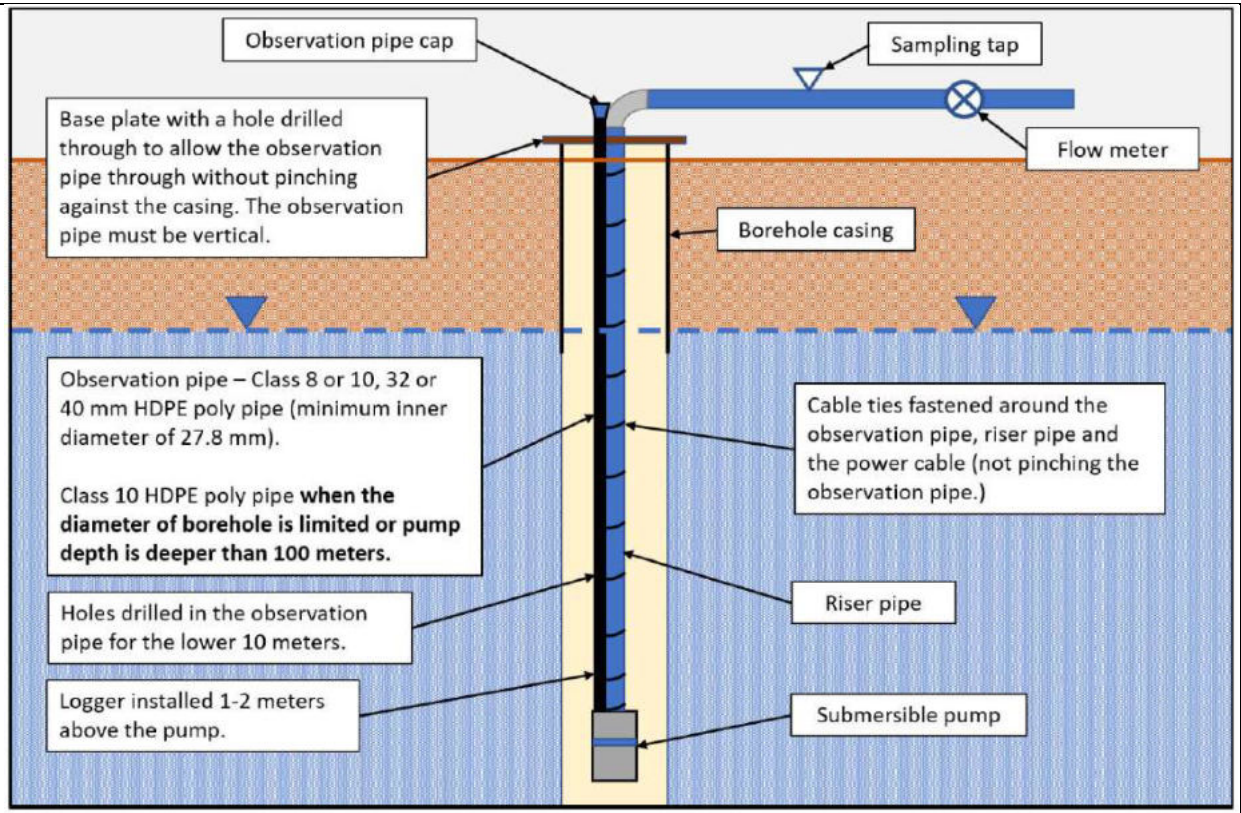


Figure 4A: Monitoring Infrastructure.

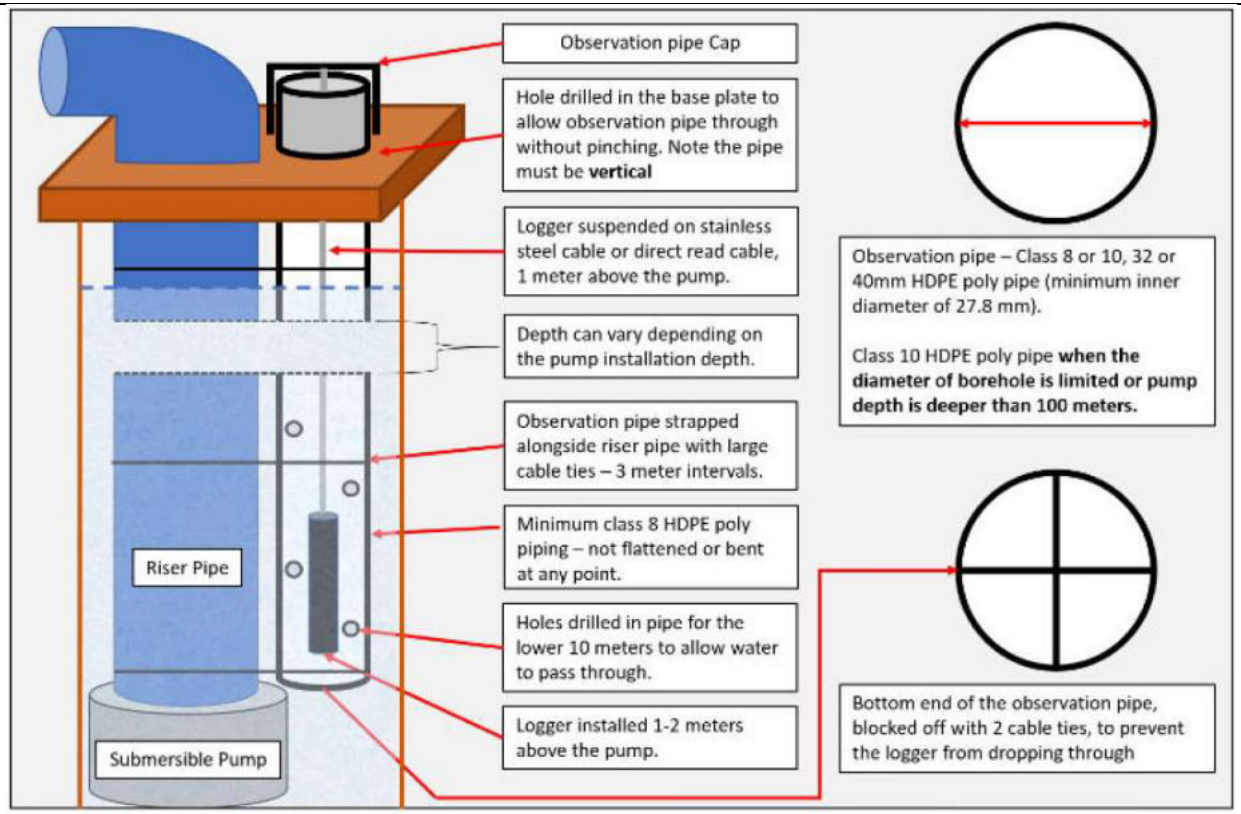


Figure 4B: Monitoring Infrastructure.

Remedial Action	The groundwater abstraction should be reviewed to ensure that it is sustainable based on the monitoring data obtained. Owner to take immediate action against non-compliance.

PERFORMANCE					
Acceptable Yes	**Acceptable Yes**	**Details of Transgression**	**Responsible Party**	**Action Taken**	**Date**

SECTION 5: COMPLIANCE AND MONITORING

5.1 Monitoring

The monitoring of works on site is necessary to demonstrate compliance with the specifications of the EMPr and to allow for problems or issues of non- conformance to be identified and appropriate corrective measures to minimise environmental damage to be implemented.

Monitoring should include visual checks by the Farm Manager on a daily basis, checks on particular requirements for site activities by the ECO, as well as a review of site documentation. The ECO or suitable person shall complete the performance record at the end of each table, as a record of transgressions or problems experienced on site and how they were dealt with.

Monitoring of activities on site by the ECO should be done as follows: An initial site visit prior to any activities will be carried out to brief the Contractor/Farmer who will undertake the construction activities and a second site visit will be undertaken once the no-go areas have been demarcated and prior to the commencement construction activities. Site visits will be undertaken on a monthly basis during the construction phase.

5.2 Penalties and Incentives

Transgressions relate to actions by the Contractor and team members whereby damage or harm is inflicted upon the environment or any feature thereof and where any of the conditions or specifications of the EMPr are infringed upon.

In the instance of environmental damage, the damage is where possible to be repaired and rehabilitated using appropriate measures, as specified and undertaken by appropriate specialists for the account of the Applicant or other guilty party.

Where infringement of the specifications or conditions of the EMPr is registered, appropriate remedial action or measures are to be implemented for the account of the Applicant. Where non-repairable damage is inflicted upon the environment or non-compliance with any of the EMPr obligations is registered then the Contractor may face a monetary penalty to an amount specified by the ECO. The ECO reserves the right to implement a first offence warning.

Transgressions are most likely to occur with respect to litter on site, damage to trees on site, disturbance of sensitive areas. The following penalties are suggested for the above-mentioned transgressions:

- Waste: In the case of excessive waste the ECO is to allow the Contractor 24 hours in which to remove the litter or face a monetary penalty at the ECO's discretion.
- Damage of River System or conservation area: A monetary penalty to the maximum of R5000 is to be paid for each waste act within a River System or the Conservation Area.
- Erosion: Erosion resulting from any work on site is to be rectified at the cost of the operator/farmer.

If excessive infringement with regard to any of the specifications is registered, the Applicant reserves the right to terminate the Contractor's contract.

The above-mentioned controls are to be identified and enforced by the ECO. Issues of non-compliance noted by the ECO are to be communicated to the site manager, who holds the responsibility of ensuring

that the relevant parties are made aware of the lack of compliance with EMPr specifications and that appropriate action is taken to rectify the situation. The ECO will advise on appropriate corrective actions when necessary.

5.3 Site record

Minutes of the Contractor's meetings on site must reflect:

- environmental queries and complaints;
- actions agreed upon;
- dates of eventual compliance;
- must form part of the official environmental site record; and
- along with the Environmental Site Book and Site Diary.

In additions to the summary report, the ECO shall keep a monthly photographic record of progress on site at the start of the construction phase and an ad hoc record of incidents or events on site, especially in the case of transgressions from EMPr specifications.

5.4 Review of EMPr

The EMPr will be reviewed by the ECO on an ongoing basis. Based on observations during site inspections and issues raised at site meetings, the ECO will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site.

Any such changes or updates will be registered in the ECO's monthly record, as well as being included as an annexure to this document. Annexures of this nature must be distributed to all relevant parties on site.

5.5 Environmental Audits

A suitably qualified Environmental Auditor is to be appointed, to undertake audits of compliance with the EMPr. An audit should be undertaken 6 months after construction activities have been commenced with and 6 months after completion of construction activities/ the operation phase has commenced.

Objectives should be to audit compliances with the key components of the EMPr, to identify main areas requiring attention and recommend priority actions. The audit should cover a cross section of issues, including implementation of environmental controls, environmental management, and environmental monitoring.

Results of the audits should inform changes required to the specifications of the EMPr, or additional specifications to deal with any environmental issues which arise on site and have not been dealt with in the current document.

ANNEXURE 1: CURRICULUM VITAE

CURRICULUM VITAE of PAUL HENDRIK SLABBERT

ENVIRONMENTAL & HERITAGE IMPACT PRACTITIONER

EAPASA Reg 2020 • Ref: 2019/1036

1. PERSONAL DETAILS

Born:	23 May 1973
Nationality:	South African
Drivers License:	Code EB
Languages:	Proficient in English and Afrikaans

2. KEY COMPETENCIES

I've completed my BACCALAUREUS ARTIUM ET SCIENTIAE Honors degree at the Potchefstroom University for CHO in 1995. The degree is primarily focused on qualifying Town and Regional Planners, but due to the SCIENTIAE (Science) component it equipped and stimulated my passion for environmental planning. Geography & Environmental studies, Sociology, Statistics and Mathematics in the first year and Geography & Environmental studies, Sociology in the second year formed the bases of my environmental education and interest. Economics up to 3rd year level and Statistics, Project Management and Planning Legislation at 4th year level provided me with an advance understanding of the development industry. The Town and Regional Planning curriculum from 1st to 4th year covered the entire spectrum of the built, people, heritage, natural and aesthetic environment in relation to the potential impacts on the socio, economic and bio-physical environment.

I started my Environmental Assessment Practitioner (EAP) career in 1998 as a professional practicing initially in the eco-tourism development industry. My passion for environmental, heritage & land-use planning with associated management strategies enable me to facilitate with all role players to find workable solutions in order to implement sustainable development in Greenfield areas. Due to the ECA (Act No. 73 of 1989) Section 21 Activities identified in 1997/8 the projects I was involved with required authorisation ito the ECA. As a result I started to practice as an EAP obtaining authorisations for triggered developments. I gained experience in rural and urban development with the emphasis on environmental impact assessments and management. This enabled me to have various publications in leading eco-tourism magazines. I've been witness to the evolution of the EIA industry from ECA to NEMA up to the current EIA Regulations. I've been operating as a Principal EAP and Environmental Practice owner for over 20 years.

During my career to date I have accumulated experience in the following key areas:

Impact Practitioner & Environmental Planner:

- Environmental Impact Assessments [legislative & process],
- Heritage & Visual Impact Assessments [legislative & process],
- Mining [legislative & process],

- Environmental Management [environmental control, management plans, Environmental & Social Management Systems],
- Conservation [management strategies, funding & alien vegetation],
- Power Generation [generation, distribution and powerline alignment]
- Land-Use [forward planning, feasibility study, business plan],
- Eco-tourism [trails, birding, recreation, construction, lodging],
- Community [facilitating, public participation, education],
- Water use authorisation [WULA's, GA's pollution prevention management plans and ELU's];
- Waste Management Licences [legislative & process];
- Air Emission Licences [legislative & process],
- Coastal Water Discharge Permits [legislative & process],
- Organizers [events, strategic, project management].

Business & Corporate Reasonability:

- Information on my Environmental Practice, PHS Consulting please view at www.phsconsulting.co.za
- For overview of my social and community engagement programme visit www.africanvisionfoundation.co.za

Advanced Legislative Knowledge:

Providing specialist services and managing and driving projects related to the following legislation:

- National Environmental Management Act (Act No. 107 of 1998) and 2017 Regulations;
- Environmental Conservation Act (Act No. 73 of 1989);
- National Heritage Resources Act (Act No. 25 of 1999);
- Land Use Planning Ordinance (Ordinance 15 of 1985);
- National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008);
- National Environmental Management: Waste Act (Act No. 59 of 2008);
- National Environmental Management: Air Quality Act (Act No. 39 of 2004);

- Mineral and Petroleum Resources Development Act (Act No. 28 of 2002);
- National Water Act (Act 36 of 1998);
- National Water Services Act (Act 108 of 1997).

3. TERTIARY EDUCATION

3.1 Honors Degree in B Art Et Scien (Planning)

Year/s of study:	1992 – 1995 (received 96/03/04)
Institution:	University of Potchefstroom (PU for CHO)
Course Modules:	Geography and Environmental Studies Industrial Sociology Town & Regional Planning Economics Mathematics Philosophy Sociology Statistics Planning Legislation
Honors Thesis:	Sustainable Development of Ikageng Township

4. REGISTRATIONS AND AFFILIATIONS

- Certified Member of the Interim Certification Board for Environmental Assessment Practitioners of South Africa – May 2009
- Professional Certified Member of AHAP now the Association of Professional Heritage Practitioners (APHP)
- Professional Member of the International Association for Impact Assessment (IAIA)

5. EMPLOYMENT RECORD

4.1 Current

Designation:	Self-Employed Principal Environmental Assessment Practitioner Heritage Assessment Practitioner Environmental Planner
Period:	1998 to current
Key responsibilities:	Environmental Practice (PHS Consulting) Owner that conduct, manage and review EIA's, Basic Assessments, Coastal Water Discharge Permit, Air Quality Licenses, Waste Management Licenses, Setback Line applications, Water Use Authorizations, General Authorizations, NEMA S24G Applications, Mining Permit and License applications. Authorisation and License compliance audits, EMP's, ECO

work, Social and Labour plan compilations, Alien Eradication Management Plans, Fire Management Plans, Maintenance Management Plans, Wild Life Management Plans. Environmental feasibility planning, event organizing and Corporate Social Investment programmes.

PHS Consulting: As sole Member of the Close Corporation I currently employ two fulltime EAP's namely Amanda Fritz-Whyte and Nadine Duncan. We make use of various freelance EAP's and specialist consultants depending on the project type.

4.2 Pre PHS Consulting

Designation: Employed by OmniPlan
Period: 1997 to 1998
Key responsibilities: Planning Administration, Town Planning Applications, Constraint Analysis, Layout and Design, Community Presentations.

6. COURSE / CONFERENCE PARTICIPATION

5.1 Short courses completed

I attended various DEA&DP, APHP, IAIA, Fynbos & SANBI forum workshops, training programmes and conferences since 1999 to date.

7. LIST OF EIA PROJECTS TO DATE

Please note over the years in practice I conducted many projects and it's impossible to list them all. He is a summary of the most relevant EAP projects that illustrate my competence, knowledge and experience.

Major project	Tasks	Employer/client	Responsibility
Namaqualand Casino Development **1998**	Evaluate and assess various site alternatives for the development of a casino in Namaqualand. Assess bio-physical & socio-economic environments from Garies to Vioolsdrif to Pella inland environments. Assessment of the entire coastal environment from Groenrivier mouth to Alexander bay. Presented preferred site alternative to be included in national bid for license allocations	Namaqualand District Council	Act as researcher, public participation liaison and site assessment consultant
Barolong Archaeological Eco-tourism Assessment **1999 - 2000**	Investigate the feasibility to develop eco-tourism activities amongst the Barolong Tribe kraal systems on the highlands of the North West Province. After survey and mapping, proposed a feasible site close to Hartebeesfontein (NW). Planned hiking and mountain bike trails system in terms of bio-physical and heritage constraints. Drafted a management plan for trail system and developed the trail system and product. Launched and operated initial phase until handover to landowners.	Hartebeesfontein Farmers Association	Site Analysis, layout development, Heritage Practitioner (HP) and environmental management and ECO work

EIA's on 4x4 trails and overnight huts, **2000 - 2001**	Completed 3 x EIA's on 4x4 trails in the Du Toit Kloof and Hexriver mountains. Worked according to DECAS guidelines and ECA process at the time.	Private Landowners and conservancies	EAP
Anglo Gold Game Reserves – North West, Gauteng, Free State Provinces **2001**	Contracted as Environmental Management Officer for Anglo Gold mining group in Vaal Reefs. I drafted EMP's for all three of the Nature Reserves and Interpretation Centres. This was followed by ecotourism master plans to focus on sustainable use of the Reserves. I acted as ECO, for the building projects (Lodges) in the reserves and on most of the adjacent mining areas. Water Management and monitoring of water samples were part of the duties	Anglo Gold Ashanti	ECO, HP and IEM officer
Contracted by Uluntu Environments for trail planning and assessments **2002**	Status quo assessments on all trails and tracks conditions in the Rhodes Memorial, Devils Peak, Sandy Bay , Buffels Bay, Table Mountain and Cape Point areas of the Cape Peninsula National Park. Proposed rehabilitation plans, construction plans and new routes. Assess potential impact on new and disturbed areas. Construction implementation and ECO.	City of Cape Town, Cape Nature	Planning, Environmental Assessment & ECO
Kronendal Estate Residential Development – Houtbay, **2003**	Environmental Impact Assessment and EMP's	Dormacorp Pty Ltd & First Plan town and regional Planners	EAP
Community Centre site selection – Pringle Bay **2003**	Site Analyses in coastal zone, with comprehensive public participation. This was to determine a feasible site form both an environmental and community perspective	Hangklip Kleinmond Municipality	Site Assessor and Public participation Liaison
Mosaic Farm, Walkerbay Fynbos Conservancy, Stanford, Western Cape **2003 – 2005**	Project and Conservation Management contract, responsible for drafting and implementing a major, building restoration and alien clearance program. Planning and implementing the Walkerbay Fynbos Conservancy Hiking trail alignments and management plans. Responsible for assessing development footprints for overnight camps. Implementation of a fire management plan and action plan.	Hermanus Riviera Estates	Environmental Planner, HP, Implementing Agent and Assessor
Chairman Birdlife Walke Bay **2003 - 2005**	Established bird club and birding project in the Overberg and the Stanford Bird fair	Birdlife South Africa	Chairman (WB), Event Organiser and Community Liaison
Hoopjiesrivier, Free Range Chicken Farm (Farm 541 Caledon)– Karwyderskraal, **2006**	Basic Assessment and EMP's	ITAKANE	EAP
Heritage Heights (Portion 81 of the Farm 229) residential	Visual Impact Assessment (VIA) and Heritage Impact Assessment (HIA)	Andre Snyman	VIA and HP

development – VanWyksdorp, **2006**			
Kleinberg residential and retirement village development (erf 459) – Riviersonderend **2007**	Basic Assessment, EMP's and Landscape Planning	Jacob du Toit	EAP
Gansbaai Industrial extension (erf 210) – Gansbaai **2007**	Basic Assessment, EMP's	Overstrand Municipality	EAP
Kleinbaai harbour dredging – Gansbaai **2007**	Basic Assessment, EMP's	Overstrand Municipality	EAP & ECO
Langeberg Cheese factory (Portion 69 of Farm no.159) – Buffelsjag **2008**	Basic Assessment, EMP's	Langeberg Kaas Pty Ltd	EAP
Industrial development (erf 931)- Struisbaai **2008**	Basic Assessment, EMP's, Landscape Planning	Louis Greeff	EAP
Shopping Centre Development – Livingstone Zambia **2008**	EIA and EMP's	Shoprite Checkers	EAP
Billboard development (erf 35270) – Milnerton **2008**	Basic Assessment, EMP's	CK Outdoor Advertising Pty Ltd	EAP
Fick's Pool Restuarant – Hermanus **2008**	Basic Assessment, VIA and HIA	Overstrand Municipality	EAP. VIA & HP Practitioner
Residential Development (erf 1497) – Vermont **2009**	Basic Assessment, EMP's, Landscape Planning	CRISTATUS INV 85 CC	EAP
Single Dwelling Development (erf 278) – Malgas **2009**	Basic Assessment, EMP's	PJW Terblanche	EAP & ECO
Petrol Filling Station (erf 1) – Swellendam **2009**	Scoping, EIA and EMP's	Swellendam Municipality	EAP

Fish Processing Plant – St Helena Bay **2009**	Basic Assessment, EMP's	West Point Processing Pty Ltd	EAP & ECO
Bloemendal Wine Estate – Durbanville **2009**	VIA and HIA	Spirito Trade 82 Pty Ltd	VIA & HP Practitioner
Maandagskop and Airport Quarries – Mosselbay and George **2009**	Environmental Management Programme Reports and Audits	Terblanche Transport	Environmental Auditor
Matroosberg Reserve (Farm 424) Ceres **2010**	Basic Assessment & EMP's	Erfdeel Boerdery	EAP & ECO
Kleinbaai Harbour Expansion (Erf 423) - Gansbaai **2010**	Basic Assessment & EMP's	Overstrand Municipality	EAP
Retirement Village Development (Erf 5379 & 5300) – Onrusrivier **2010**	Basic Assessment, EMP's & ECO	Tweefonteine Ontwikkelings Trust	EAP & ECO
Industrial Development (Erf 2015) – Riversdale **2010**	Basic Assessment, EMP's & ECO	Hessequa Municipality	EAP & ECO
Residential Development (Erf 987) – De Kelders **2011**	Basic Assessment & EMP's	Hopefull Trust	EAP
Unlawful Vegetation Removal (Farm 237) - Elim **2011**	S 24 G & EMP	Moravian Church of Elim	EAP
Graveyard Development – Springbok, Okiep, Bergsig, Matjieskloof, Kommagas, Nababeep – Northern Cape **2011**	Basic Assessments & EMP's	Nama Khoi Local Municipality	EAP
Residential Development (Erf 8704) – Paarl **2011**	Basic Assessment & EMP's	Nevensaan Ontwikkelings	EAP
Wetland Rehabilitation – Tesselaarsdal **2011**	Basic Assessment & EMP's	Department of Agriculture and Tesselaarsdal Action Group	EAP

Mushroom Farm Development (Farm 436/27) – Botrivier **2011**	Basic Assessment & EMP's Waste Licence	Ocean Mushrooms	EAP & ECO
Blouberg Mine Development (Farm 88 & 91) – Melkbosstrand **2012**	Visual Impact Assessment	Tip Trans	Visual Assessor
Urban Expansion Residential Estate (Farm 436/5) – Botrivier **2012**	Scoping, EIA & EMP's	Crimson Properties	EAP
Cemetery Development (Erf 513 – Napier **2012**	Basic Assessment & EMP's	Cape Agulhas Municipality	EAP
Coastal Sidewalks Development (Erf 462) - Franskraal **2012**	Basic Assessment & EMP's	Overstrand Municipality	EAP
Riverside Residence Development (Farm 321) – Stanford **2012**	Basic Assessment & EMP's	Astrodome Investments	EAP
Eco- Village Development (Farm 483/2) - Caledon **2012**	Basic Assessment & EMP's	Theewaterskloof Municipality	EAP
Botrivier Windfarms – Botrivier **2013**	Appointed to oppose the development of windfarms outside regional allocated areas as part of the "Wind Rush" period. Scrutinise and evaluate Scoping & EIA Documents on behalf of opposition. Handling of Appeal.	Wildekrans Wine Estate and Botriver Community	Opposing EAP
Resort Development (Farm 213) – Bonnievale **2013**	S24 G & EMP's	De Hoek Trust	EAP
Commercial Development – Chililabombwe Zambia **2013**	EIA	Shoprite Checkers	EAP
Birding Route Development – South Africa **2013 to 2016**	Environmental Planning to establish and support birding development in all the South African Provinces	E Snell & Co Funder and BirdLife SA and SANPARKs Honorary Rangers	Environmental Planner
Intensive Feed Farm Development (Farm 728/2) – Grabouw **2013**	Basic Assessment & EMP's	Babel Trading	EAP & ECO

Uilenvlei Private Nature Reserve, resort development – Uilkraalmond **2013**	Basic Assessment & EMP's	Southern Spirit Properties	Compile & Review EAP
Development of five Cemeteries - Upington **2014**	Basic Assessment & EMP's	Khara Hais Local Municipality	EAP & HP
Commercial Development – Mongu Zambia **2014**	EIA	Shoprite Checkers	EAP
Establish Hartenbos River Water Users Association – Hartenbos **2014**	Draft Constitution, verify ELU's conduct Public Consultation	Hartenbos River Water Users Association	Water Resource Consulting
Commercial Development Cabinda – Angola **2014**	EIA	Shoprite Checkers	EAP
Resort Development (Farm 633 & 273) – Swellendam **2014**	Basic Assessment & EMP's	Bakkelys Drift Properties	EAP
Natures Path Lifestyle Village - Keurboomstrand **2015**	Heritage Impact Assessment guiding the EIA process towards a more aesthetic SDP	Sharples Environmental	Heritage Impact Assessor (HP)
Hazardous Waste Assessment – Castle Mews Woodstock **– 2015**	Assess hazardous waste contamination in basement of old buildings, establishing the source and report finding the competent authorities. Assist with drafting management actions to clean-up and resolve.	Castle Mews	Waste Assessor
Commercial Development Kuito – Angola **2015**	EIA	Shoprite Checkers	EAP
Residential Development (Farm 142/14) – Rheebok **2015**	Basic Assessment & EMP's	Mercedes Trust	EAP & ECO
Water Act and Use Interpretations for Commercial off grid Systems – Western Cape **2015**	Site Assessments, Technology Assessment, Legislation Applicability, Interpretation of the Water Act.	Shoprite Checkers	Water Assessor

Coastal Sidewalk and Trail Development – Kleinmond **2015**	Basic Assessment & EMP's	Overstrand Municipality	Review EAP
Wetland Rehabilitation Plan; Operational Environmental Management Plan and Environmental Liaison Committee – Sun Valley Mall Noordhoek **– 2015**	Rehabilitation Plan, OEMP & ELC	Shoprite Checkers and City of Cape Town	EAP & ECO
Air Emissions Licence (2 Neil Hare Rd) - Atlantis **2016**	Air Emissions Assessment	Malmesbury Sterilisasie Aanleg	EAP
Kenhardt Solar Power Farms and Power Lines – Northern Cape **2016-2018**	Appointed to investiage the development of solar farms an powerline distribution lines outside regional allocated areas as part of the "Solar Rush" period. Scrutinise and evaluate Scoping & EIA Documents on behalf of opposition. Handling of Appeal.	Dagab & Rooidam Farms	Analysing EAP
Jetty Development in Protected Area (Farm 480/136) – Stillbaai **2016**	Basic Assessment & EMP's	Koringfontein Farm	Review EAP
Intensive feed Farm (Farm 226) – Hermanus **2016**	Basic Assessment & EMP's	Bapchix	Review EAP & ECO
Industrial Development (Erf 1) - Caledon **2016**	Basic Assessment & EMP's	Theewaterskloof Municipality	EAP
Abalone Farm Development (Farm 421/1) – Doringbaai **2016**	Basic Assessment & EMP's	Doring Bay Abalone	Review EAP
Stander Mine (Farm 189/83) – Wilderness **2016**	Basic Assessment & EMP's	Viadro 127	EAP & ECO
ECO Lifestyle Estate & Nature Reserve, Hoek vd Berg (Farm 572) – Hermanus **2017**	Scoping EIA & EMP's, HIA	Saddle Path Properties	Review EAP, Heritage Assessor and Water Assessor
Abalone Farm Development (Farm	Basic Assessment & EMP's	Jacobsbaai Sea Products	Compile & Review EAP & ECO

108) - Jacobsbaai **2017**			
Demolition Waste Management – Cape Peninsula **2017 ongoing**	Waste Management Plans for demolition and redevelopments	Shoprite Checkers	Waste Assessor
Resort Development (406/58) – Slanghoek **2017**	Basic Assessment & EMP's	Slanghoek Resort	Review EAP & Visual Assessor
Resort Development (Farm 627/1) - Stanford **2017**	Basic Assessment & EMP's	Philipskop	Review EAP
Intensive Feed Farm (Farm 541/6) – Karwyderskraal **2017**	Basic Assessment & EMP's	Itakane Trading	Review EAP & ECO
Henkershoek Mine (Farm 628) – Albertinia **2017**	Basic Assessment & EMP's	Viadro 127	Compile & Review EAP
Heavy Minerals Prospecting (Alexcor Mining Right Area) – Alexanderbaai **2018**	Basic Assessment & EMP's	Vast Mineral Sands	EAP
Commercial Development Namibe – Angola **2018**	EIA	Shoprite Checkers	EAP
Resort Development (Farm 465) – Elgin **2018**	Basic Assessment & EMP's	On The Earth	Review EAP
Residential Development (Erf 1019) - Wilderness **2018**	Basic Assessment & EMP's	Costa	Compile & Review EAP
Residential Development (Erf 1156) – Witsand **2018**	Basic Assessment & EMP's	Westfield Trust	EAP & ECO
Van Der Stell Liquor Store – Stellenbosch **2019**	Heritage Impact Assessment	Shoprite Checkers	HP
Weir and Pipeline Development (Huiskloof River) – Botrivier **2019**	S24G & EMP's	Erin de Vigne	EAP

Crocodile Diving Facility (Erf 48) – Birkenhead **2019**	Cape Nature Permitting & EMP	Afrikanos	EAP
Abalone Farm Development (Farm 6/453) – Gouritsrivier **2019**	Basic Assessment & EMP's	Aqunion	Compile & Review EAP
Heavy Minerals Prospecting (Trans Hex Mining Right Area) – Hondelipbaai **2019**	Basic Assessment & EMP's	Saxon	EAP
Intensive Chicken Farm (Farm 487) – Caledon **2019**	Basic Assessment & EMP's	Elgin Free Range Chickens	Review EAP
Agricultural Cultivation (Farm 3/497) – Malgas **2019**	Scoping, EIA & EMP's	Eksteen Familie Trust	Review EAP
Airport Quarry (Farm 129/208) – George **2019**	Scoping, EIA & EMP's	Mercedes Trust	Compile & Review EAP
Constantia Emporium Retail Centre - **2020**	Heritage Interpretation Story & Signage	Shoprite Checkers	HP
Commercial Retail Development – City of Cape Town **2017 – 2020**	Environmental Management Plans & Environmental Control Officers various projects, Delft, Sun Valley, Constantia, Sitari, Brackenfell, Paarl, Table View and Gordons Bay.	Shoprite Checkers	EMP & ECO
Heavy Mineral Mines – Alexcor Northern Cape **2020 – 2021**	Environmental Impact Study	Deep Blue Minerals	EAP
Free Range Chicken Farms – **2020 – 2021**	Environmental Impact Assessment	Elgin Free Range Chickens	EAP
Sitari Retail Centre - **2021**	Heritage Interpretation Story & Signage	Shoprite Checkers	HP
Cape Winelands Airport – City of Cape Town **2021 – 2022**	Environmental Impact Study	Cape Winelands Airport	EAP
Hoop Urban Expansion – Overberg **2022**	Environmental Impact Study Heritage and Visual Impact Study	Hoop Trust	EAP & HIA
Mill Steam – Stellenbosch **2022**	Heritage Impact Assessment	Shoprite Checkers	HP

Commercial Heritage Development – Paardevlei **2022**	Heritage Impact Assessment	Shoprite Checkers	HP

C U R R I C U L U M V I T A E

J E N N A M A R E E T H E R O N

E N V I R O N M E N T A L A S S E S S M E N T P R A C T I T I O N E R

EAPASA Reg no: 2022/5926

PERSONAL PROFILE

Gender: Female	Date of Birth: 4 October 1984
Nationality: South African	Languages: Proficient in English and Afrikaans

KEY COMPETANCIES

I completed my Bachelor's degree (International Studies) focusing on Political Science, History and Sociology in 2005 and my Master's degree (Cultural Tourism and Heritage Studies) at the University of Stellenbosch in 2007. My Master's degree was undertaken predominately through the Department of History and the Department of Geography & Environmental Studies. In 2008 I was accepted into the City of Cape Town's Environmental Resource Management Departments Internship Program for a 12-month period. My internship was invaluable to my career as it equipped me with the practical skills and knowledge behind environmental planning. I received a certificate of commendation for 'Outstanding contribution to the Environmental Internship Programme 2008'. I officially started my EAP career in 2009 as a professional Environmental Consultant within the Private Sector and resign from Doug Jeffery Environmental Consultants as a Senior Environmental Consultant in 2016 to pursue a freelance career as an Environmental Consultant. I have gained experience in rural and urban development with the emphasis on environmental impact assessment and management within South Africa, operating as an EAP for over 15 years.

During my career to date, I have accumulated experience in the following key areas:

- Environmental Impact Assessments [legislative & process],
- Environmental Management [environmental control, management plans, Environmental Management Systems],
- Community [facilitating, public participation];
- Waste Management Licenses [legislative & process];
- Air Emission Licenses [legislative & process],
- Coastal Water Discharge Permits [legislative & process],
- Section 34 Heritage Permits,
- Organizers [project management].

Advanced Legislative Knowledge in:

- National Environmental Management Act (Act No. 107 of 1998) and 2017 EIA Regulations;
- National Heritage Resources Act (Act No. 25 of 1999);
- Land Use Planning Ordinance (Ordinance 15 of 1985);
- National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008);
- National Environmental Management: Waste Act (Act No. 59 of 2008);
- National Environmental Management: Air Quality Act (Act No. 39 of 2004); and
- National Water Act (Act 36 of 1998).

EDUCATION

2006-2007 Tertiary education (Cum Laude)

Stellenbosch University

Masters in Philosophy (MPhil), Cultural Tourism and Heritage Studies (2 Years)

2003-2005 Tertiary education

Stellenbosch University
Bachelor of Arts (BA), International Studies (3 Years)

EMPLOYMENT RECORD

OVER 17 YEARS EXPERIENCE IN EIA'S

Freelance Environmental Consultant (2017 - present)

Senior Environmental Assessment Practitioner

- Training and experience in applying the principles of Integrated Environmental Management (IEM), and in applying the Environmental Impact Assessment (EIA) Regulations to a number of development projects and initiatives in South Africa that trigger the National Environmental Management Act.
- Facilitation, co-ordination, management and monitoring of all aspects of the EIA process.
- Liaising with specialists and all members of the project team to ensure a full understanding of the scope of work required throughout the process;
- The compilation of reports: Applicability Applications, Constraints Analysis, Basic Assessment Reports, Scoping and Environmental Impact Assessment Reports, Damage Assessment Reports (24G Applications), Rehabilitation Plans, Audit Reports and Environmental Management Programmes;
- Liaising with interested and affected parties and facilitating the public participation process required in terms of the EIA Regulations; and
- The compilation of Section 34 Heritage Applications including the liaising with the public and heritage authorities.

Doug Jeffery Environmental Consultants (2009 - 2016)

Senior Environmental Assessment Practitioner

- Training and experience in applying the principles of Integrated Environmental Management (IEM), and in applying the Environmental Impact Assessment (EIA) Regulations to a number of development projects and initiatives in South Africa that trigger the National Environmental Management, the National Environmental Management: Waste Act etc..
- Facilitation, co-ordination, management and monitoring of all aspects of the EIA process.
- Liaising with specialists and all members of the project team to ensure a full understanding of the scope of work required throughout the process;
- The compilation of reports: Constraints Analysis, Basic Assessment Reports, Scoping and Environmental Impact Assessment Reports, and Damage Assessment Reports (24G Applications) etc.;
- Liaising with interested and affected parties and facilitating the public participation process required in terms of the EIA Regulations.

City of Cape Town: Environmental & Heritage Resource Management

Internship (2008)

- Read, assess and comment on EIA, EMP, OEMP, CEMP, and Basic Assessments as per NEMA.
- Read, assess and comment on land-use planning applications, mining applications and heritage applications.
- Process signage applications.
- Assess and prepare approvals for landscaping plans.
- Compliance monitoring.
- Undertake site visits and write reports.
- Attend meetings and take minutes.
- Liaise with ECO's.
- Filling and administrative tasks.
- Assist members of the public with general environmental, heritage and signage queries.

PROFESSIONAL AFFILIATION:

Member of IAIA (International Association for Impact Assessment)
Member of Association of Professional Heritage Practitioners – Western Cape (APHP)
Professional Member of EAPASA - EAPASA Reg no: 2022/5926

COURSE CONFERENCE PARTICIPATION:

I attended various DEA&DP & IAIA forum workshops, training programmes and conferences since 2008 to date.

PROJECT RECORD TO DATE:

COMPLETION DATE	PROJECT DESCRIPTION	TYPE	APPLICANT:	ROLE:
1 NOVEMBER 2023	THE "CARPENTERS WORKSHOP" ON ERF 18792, SOMERSET WEST	Section 34, NHRA	SHOPRITE CHECKERS (PTY) LTD	Main Author & Researcher of Heritage Statement. Assisted & reviewed by Paul Slabbert Liaised with Authorities & IA&Ps and conducted PPP
29 AUGUST 2023	THE "LOCOMOTIVE SHED" ON ERF 18792, SOMERSET WEST	Section 34, NHRA	SHOPRITE CHECKERS (PTY) LTD	
3 APRIL 2023	ERF 12257, HERMANUS (4 SEA ROAD, "THE KEEP")	Section 34, NHRA & NEMA Applicability Checklist	SERAF DEVELOPMENT 1 (PTY) LTD.	
1 AUGUST 2023	EXPANSION OF THE EXISTING SHOPRITE CHECKERS DISTRIBUTION CENTRE SITUATED ON ERF 8741 WELLS ESTATE, EASTERN CAPE PROVINCE.	AMMENDED EA	EQUITIES PROPERTY FUND LIMITED	<u>Principle EAP:</u> Main Author of all reports (reviewed by Paul Slabbert) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
End 2022	THE WEST POINT PROCESSORS FISH PROCESSING PLANT ERF 1097/3, ST HELENA BAY.	ANNUAL AUDIT REPORT	WEST POINT PROCESSORS	
AUGUST 2022	THE MATROOSBERG 4x4 TRAIL ON THE REMAINDER OF FARM 424 (CERES), PORTION 3 OF FARM 356 (CERES), FARM 355 (CERES), FARM 40 (WOCESTER) & THE REMAINDER OF FARM 57 (WOCESTER), WESTERN CAPE	EMP (OPERATIONAL PHASE)	MATROOSBERG RESERVAAT CC	
OCTOBER 2022	THE PROPOSED EXPANSION/ UPGRADING OF THREE DAMS AND ASSOCIATED INFRASTRUCTURE FOR THE PURPOSES OF ESTABLISHING ORCHARDS AS WELL AS THE CONSTRUCTION OF AN AIRSTRIP, HANGAR AND JETTY ON PORTION 4 OF FARM	BAR/EMP	FULELA TRADE AND INVEST 68 CC.	

	NO. 493 (INHOEK FARM), SWELLENDAM			
NOVEMBER 2022	THE PROPOSED REVERSE OSMOSIS (RO) PLANT AT THE WEST POINT FISH MEAL PROCESSING PLANT, ON ERF 1097, ST HELENA BAY, WESTERN CAPE	BAR/ EMP/ CWDP	WEST POINT PROCESSORS	
MAY 2022, amended AUG 23	REMOVAL OF VEGETATION ON PORTION 3 OF FARM JONKERSRUST, NO. 548, SWELLENDAM	REHAB PLAN	BLOMDAL PLASE PTY LTD	<u>Principle EAP:</u> Main Author of all reports (reviewed by Paul Slabbert) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
APRIL 2022	CAMP SITE ON PORTION 3 OF FARM MICHELS KRAAL NO. 457, SWELLENDAM	REHAB PLAN	KOESANIE TRUST	
27/07/2022	THE PROPOSED EXPANSION OF WEST POINT PROCESSORS, ON ERF 1097, ST HELENA BAY, WESTERN CAPE.	BAR/ EMP/ AEL/ CWDP	WEST POINT PROCESSORS	
End 2021	THE WEST POINT PROCESSORS FISH PROCESSING PLANT ERF 1097/3, ST HELENA BAY.	ANNUAL AUDIT REPORT	WEST POINT PROCESSORS	
NOVEMBER 2020	REMAINDER OF FARM (HOEK VAN DE BERG) NO. 572, HERMANUS: LANDING STRIP REHABILITATION PLAN	AUDIT REPORT	UVA PROPERTIES (PTY) LTD	
AUGUST 2020	THE WEST POINT PROCESSORS FISH PROCESSING PLANT ERF 1097/3, ST HELENA BAY.	CONTINGENCY PLAN	WEST POINT PROCESSORS	
End 2020	THE WEST POINT PROCESSORS FISH PROCESSING PLANT ERF 1097/3, ST HELENA BAY.	ANNUAL AUDIT REPORT	WEST POINT PROCESSORS	
25/11/2019	THE WEST POINT PROCESSORS FISH PROCESSING PLANT ERF 1097/3, ST HELENA BAY.	EXTERNAL AUDIT REPORT	WEST POINT PROCESSORS	<u>Principle EAP:</u> Independent Auditor
22/11/2019	THE PROPOSED CULTIVATION OF LAND ON PORTION 3 OF FARM MELK HOUTE BOSCH NO. 497, SWELLENDAM, WESTERN CAPE	EIA/EMP	JOHANNES EKSTEEN FAMILIETRUST	<u>Principle EAP:</u> Main Author of all reports

14/11/2019	THE UNLAWFUL CONSTRUCTION OF A PIPELINE AND A WEIR IN THE HUISKLOOF RIVER (BOTRIVIER)	24G/EMP	ERIN DE VIGNE (PTY) LTD.	(reviewed by Paul Slabbert) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
16/01/2017	THE CONSTRUCTION OF A COMMERCIAL SHOPPING CENTRE ON PORTION 6 OF FARM BARDALE NO.451 AND PORTION 6 OF FARM AMSTERDAM NO 949, BLUE DOWNS	AMENDMENT	SHOPRITE CHECKERS PROPERTIES (PTY) LTD.	
22/11/2016	THE PROPOSED CONSTRUCTION OF A JETTY, ON PORTION 136 OF FARM 480, MELKHOUTFONTEIN (RIVERSDAL).	BAR/ EMP	FARM KONINGSFONTEIN (PTY) LTD.	
22/08/2016	THE PROPOSED DEVELOPMENT OF AN ADDITIONAL RESERVOIR ON A PORTION OF PORTION 1 OF FARM NO. 888 (LA PARRISSA), PAARL (15/44)	BAR	DRAKENSTEIN MUNICIPALITY	<u>Principle EAP:</u> Main Author of all reports (reviewed by Paul Slabbert) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
20/07/2015	THE PROPOSED CONSTRUCTION OF A RESIDENTIAL DEVELOPMENT ON PORTIONS 9 AND 17 OF THE FARM NO. 681, FIRGROVE	BAR	JANIGENIX (PTY) LTD	
30/04/2015	THE PROPOSED DEMOLISHMENT OF THE EXISTING DWELLING AND THE CONSTRUCTION OF A NEW DWELLING ON ERF 46, CASTLE ROCK (14/39)	SBL	MR ROY JAMES GILES	
06/06/2016	THE PROPOSED RESIDENTIAL ESTATE ON PORTIONS 3, 9 & 14 OF FARM NO. 654, CROYDON, STELLENBOSCH	BAR	JV WILNET (PTY) LTD	
08/09/2014	THE PROPOSED FLAT SIGNAGE TO BE ERECTED ON THE FAÇADE OF BUILDINGS AND AN ENTRANCE WALL LOCATED ON PORTION 477 OF FARM NO 728 JOOSTENBERG VLAKTE 14/35	SIGNAGE APP	LOUGOT PROPERTY INVESTMENTS (PTY) LTD.	<u>Principle EAP</u> compilation & submission of application.

22/03/2016	THE UNLAWFUL CONSTRUCTION OF FACILITIES FOR THE CONCENTRATION OF ANIMALS FOR THE PURPOSE OF COMMERCIAL PRODUCTION (FEEDLOTS) ON PORTION 3 & 8 OF FARM 128 (OSDAM FARM), PIKETBERG 14/27	24G	OSDAM BOERDERY (PTY) LTD.	<u>Principle EAP:</u> Main Author of all reports (reviewed by Doug Jeffery) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
01/12/2015	THE PROPOSED RESIDENTIAL FARMING VILLAGE ON A PORTION OF FARM 1793, SIMONDIUM, PAARL (14/42)	BAR	NIEUWE SION (PTY) LTD.	
30/10/2014	THE UNLAWFUL DECOMMISSIONING OF A SERVICE STATION ON ERF 37366, OMURAMBA DRIVE, MONTAGUE GARDENS.	24G	VAIDRO 184 CC C/O JAN DE MUNCK INC.	
28/01/2015	THE PROPOSED UPGRADE OF MAIN ROAD 281 (DRAAIBERG), VILLIERSDORP (14/14).	BAR	PROVINCIAL GOVERNMENT WESTERN CAPE: DEPARTMENT OF TRANSPORT AND PUBLIC WORKS	
10/11/2015	THE PROPOSED INSTALLATION OF A PEDESTRIAN FOOTBRIDGE AND ASSOCIATED INFRASTRUCTURE OVER THE VYGEKRAAL RIVER ON ERF 32604 LOCATED BETWEEN KEWTOWN AND BRIDGETOWN	BAR	CITY OF CAPE TOWN TRANSPORT PLANNING DEPARTMENT	
11/08/15	THE UNLAWFUL EXPANSION OF TOURIST FACILITIES AND THE CONSTRUCTION OF INFRASTRUCTURE ON PORTION 26 OF FARM NO. 1041, FRANSCHHOEK 14/01.	24G	LA MOTTE WINE ESTATE (PTY) LTD.	
29/04/2014	THE PROPOSED FORMALISATION OF THE STORMWATER DRAINAGE LINE AT KM 1.6 OFF THE KLAASVOOGDS WES ROAD (DR 01368), ROBERTSON 13/35.	BAR	CAPE WINELANDS DISTRICT MUNICIPALITY	
24/01/2014	THE PROPOSED ADDITIONS TO THE EXISTING DWELLING, ERF	SBL	MR. GEORGE P	<u>Principle EAP:</u>

	5599, BETTY'S BAY		DALL	Main Author of all reports (reviewed by Doug Jeffery) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
07/01/2014	THE PROPOSED ALTERATIONS AND ADDITIONS TO THE EXISTING BUNGALOW ON ERF 490, THE RIDGE, CLIFTON.	SBL	MR.& MS. C. WIESE	
10/12/2014	THE PROPOSED CONSTRUCTION OF A WASTE RECYCLING FACILITY ON PORTION 660 OF FARM NO. 454, WIMBLEDON ESTATE, BLACKHEATH.	BAR	RE-ETHICAL ENVIRONMENTAL RE-ENGINEERING (KZN) (PTY) LTD.	
04/03/2014	THE PROPOSED DEMOLITION OF AN EXISTING DWELLING AND CONSTRUCTION OF A SINGLE RESIDENTIAL DWELLING AND ASSOCIATED INFRASTRUCTURE ON ERF 45, BANTRY BAY.	SBL	MR.S. B. UPPINK	
30/03/2016	THE PROPOSED DEVELOPMENT OF AN ADDITIONAL DWELLING ON PORTION 99 OF FARM 559 SKILPADVLEI, PRINGLE BAY 13/02	BAR	SKILPADVLEI FARM (PTY) LTD.	
14/11/2014	UNLAWFUL CONSTRUCTION OF A TRACK FOR THE TESTING AND RECREATIONAL USE OF MOTOR POWERED VEHICLES ON THE REMAINDER OF FARM 1610, FRANSCHHOEK (13/23)	24G	L'ORMARINS (PTY) LTD.	
19/03/2015	THE UNLAWFUL CONSTRUCTION OF A SLAGMENT PLANT AND A CEMENT BLENDING PLANT ON PORTION 656, 664 AND 665 OF FARM WIMBLEDON NO. 454, BLACKHEATH	24G	MR WILLIE SCHEEPERS	
10/10/2014	THE PROPOSED ESTABLISHMENT OF THE SITARI LIFESTYLE ESTATE ON ERF 1840, CROYDON IN THE HELDERBERG.	EIA/ AMENDMENT	SITARI COUNTRY ESTATE (PTY) LTD	
10/06/2014	THE UNLAWFUL COMMENCEMENT OF A LISTED ACTIVITY: THE INFILLING OF A WETLAND ON PORTION 10 OF FARM 654, CROYDON, STELLENBOSCH	24G	JV WILNET (PTY) LTD	<u>Principle EAP:</u> Main Author of all reports (reviewed by Doug Jeffery) Liaised with
28/11/2014	THE UNLAWFUL COMMENCEMENT Of A LISTED ACTIVITY: DISPOSAL Of WASTE TO LAND ON PORTION 14 OF FARM 654, CROYDON, STELLENBOSCH	24G	JV WILNET (PTY) LTD	

11/11/2014	THE PROPOSED DEMOLITION OF THE EXISTING RESIDENTIAL DWELLING AND ASSOCIATED INFRASTRUCTURE AND THE CONSTRUCTION OF A NEW RESIDENTIAL DWELLING AND ASSOCIATED INFRASTRUCTURE ON ERF 2595, GLEN BEACH, CAMPS BAY.	SBL	MR N. M. PHILLIPS	Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
03/06/2013	THE ESTABLISHMENT OF THE HERITAGE PARK RETIREMENT VILLAGE ON A PORTION OF THE FARM ONVERWACHT NO. 811 AND A PORTION OF THE FARM DIE BOS NO. 810, SOMERSET WEST (AN 231 /25/4 FARM 810 AND 811, SOMERSET WEST)	AMENDMENT	MR. S. H. EHLERS	
22/10/2012	THE PROPOSED FLAT 'LETTER' SIGN TO BE ERECTED ON THE FAÇADE OF A BUILDING LOCATED ON ERF 160462, RIEBEEK STREET, CAPE TOWN CBD.	SIGNAGE APP	ATTERBURY INVESTMENTS HOLDINGS LTD	Principle EAP compilation & submission of application.
18/01/2013	THE PROPOSED NEW SINGLE RESIDENTIAL DWELLING ON ERF 27, CASTLE ROCK, SIMON'S TOWN	BAR	MR AND MRS HUGH AND JENNIFER HERMAN	Principle EAP: Main Author of all reports (reviewed by Doug Jeffery) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
23/11/2012	THE PROPOSED UPGRADING OF THE R304 (KOELENHOF ROAD), STELLENBOSCH.	BAR	STELLENBOSCH MUNICIPALITY	
25/09/2014	THE UNLAWFUL RECONSTRUCTION AND EXPANSION OF AN IN-STREAM DAM ON PORTION 15 OF FARM NO. 1646, TWO RIVERS FARM, FRANSCHOEK	24G	TWO RIVERS FARMS AND GARDENS (PTY) LTD	
19/08/2013	THE PROPOSED UPGRADING OF THE MEDIUM VOLTAGE DISTRIBUTION NETWORK BETWEEN CLOVELL Y AND SIMONSTOWN	BAR	CITY OF CAPE TOWN: ELECTRICITY DIRECTORATE	
16/01/2013	THE PROPOSED GREEN TECHNOLOGY MANUFACTURING CLUSTER INDUSTRIAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON PORTION 4 AND PORTION 1 Of FARM 1183, ATLANTIS.	BAR	CITY OF CAPE TOWN	

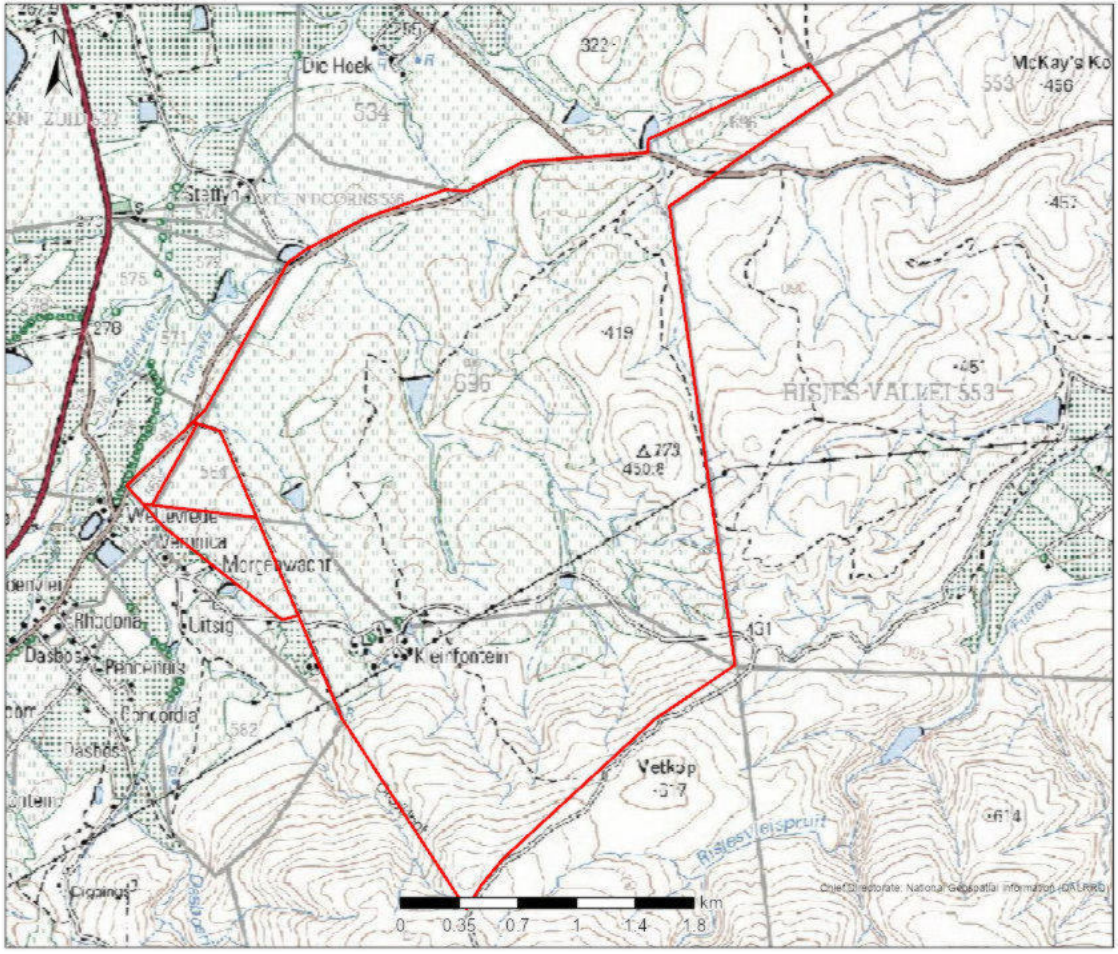
16/01/2013	THE PROPOSED GREEN TECHNOLOGY MANUFACTURING CLUSTER INDUSTRIAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON PORTION O OF FARM CA1183 AND PORTION 93 OF FARM CA4, ATLANTIS.	BAR	CITY OF CAPE TOWN	
26/09/2014	THE UNLAWFUL COMMENCEMENT OF A LISTED ACTIVITY: DREDGING OF A CHANNEL IN THE KLEIN RIVER ESTUARY, CONSTRUCTION OF A WALKWAY AND THE PROPOSED CONSTRUCTION OF A JETTYY ON PORTION 1 OF FARM NO. 723, WORTELGAT, HERMANUS	24G	HERMANUS RIVIERA ESTATES CC TRADING AS MOSAIC PRIVATE SANCTUARY	
28/05/2012	THE PROPOSED FLAT SIGN TO BE ERECTED ON THE FAÇADE OF A BUILDING LOCATED ON ERF 3316, VICTORIA STREET, SOMERSET WEST.	SIGNAGE APP	BEAV INVESTMENT HOLDINGS	<u>Principle EAP</u> compilation & submission of application.
08/02/2012	THE PROPOSED FLAT SIGN TO BE ERECTED ON THE FAÇADE OF A BUILDING LOCATED ON ERF 12715, PHILLIPI.	SIGNAGE APP	CASHBUILD	
20/02/2012	THE PROPOSED CHICKEN HOUSES ON THE REMAINDER OF FARM NO. 403, TULBAGH DIVISION AND FARM NO. 201/3, PAARL DIVISION.	NID	KLEIN VALLEI (PTY) LTD	
19/06/2012	THE THEMBOKWEZI RESIDENTIAL DEVELOPMENT ON ERF NO. 51097, KHAYELITSHA, CAPE TOWN.	AMENDMENT	OLD MUTUAL PROPERTY (PTY) LTD	<u>Principle EAP:</u> assisted by Doug Jeffery Main Author of all reports (reviewed by Doug Jeffery) Liaised with Authorities,
12/04/2011 07/03/2014	THE PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 4694 (MILKWOOD RISE), KOMMETJIE.	AMENDMENT	THE KOMMETJIE ESTATES (PTY) LTD	
25/11/2014	THE PROPOSED ESTABLISHMENT OF RESIDENTIAL ERVEN ON THE REMAINDER OF FARM NO. 948, KOMMETJIE	BAR	THE KOMMETJIE ESTATES LIMITED	
12/07/2013	PROPOSED UPGRADE AND EXTENTION OF THE WELLINGTON WASTEWATER TREATMENT WORKS.	EIA	DRAKENSTEIN MUNICIPALITY	
30/03/2011	CULTIVATION OF VIRGIN SOIL ON PORTIONS 11 AND 21 OF	BAR	SPRINGFIELD	

	FARM NO. 11.2, SPRINGFIELD ESTATE, ROBERTSON		ESTATE VINEYARDS (PTY} LTD	Organs of State, Public Consultation and Specialists Conducted PPP
25/11/2010	THE PROPOSED CHANGE OF LAND USE FROM ZONED UNDETERMINED TO ESTABLISH MALIBONGWE PARK RESIDENTIAL AREA ON THE REMAINDER OF ERF 830, PELICAN PARK	AMENDMENT	THE DEPARTMENT OF HUMAN SETTLEMENTS	
01/07/2014	THE PROPOSED UPGRADE OF THE WASTEWATER TREATMENT WORKS "WWTW" AT THE 'OLOF BERGH' DISTELLERY, GOUDINI	EIA	DISTELL (PTY) LTD	
19/10/2010	THE PROPOSED FLAT SIGN TO BE ERECTED ON THE FAÇADE OF A BUILDING LOCATED ON ERF 173335, PAARDEN EILAND.	SIGNAGE APP	FRANCIS CONSULTANTS (TOWN PLANNERS)	compilation & submission of application.
29/03/2012	THE TOWNSHIP DEVELOPMENT ON ERF NO. 56719, PHENDULA CRESENT, KHAYELITHSA.	AMENDMENT	JUBELIE PROJECT MANAGEMENT (PTY) LTD	<u>Secondary EAP</u> Main Author of all reports (reviewed by Doug Jeffery) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
08/02/2013	THE PROPOSED UPGRADE OF THE VILLIERSDORP WASTE WATER TREATMENT WORKS	EIA/ WASTE LICENSE	THEEWATERSKLOOF MUNICIPALITY	
30/01/2015	THE PROPOSED DEVELOPMENT OF A RETIREMENT VILLAGE AND ASSOCIATED INFRASTRUCTURE ON THE REMAINDER OF ERF 61, SIMONS TOWN	BAR	THE ROTARY CLUB OF CAPE TOWN	
12/05/2011	THE CONSTRUCTION OF A RESIDENCE ON ERF 52, LOVERS WALK, ROOIELS	24G	MIKE LEVETT	
24/10/2016	THE UNLAWFUL COMMENCEMENT OF LISTED ACTIVITIES: UNLAWFUL COMMENCEMENT OF LISTED ACTIVITIES TO ESTABLISH AN AGRI-PARK ON PORTION 128 OF FARM 468, STELLENBOSCH	24G	OLD ABLAND (PTY) LTD	
22/06/2011	THE RECTIFICATION OF THE UNLAWFUL CONSTRUCTION OF AN AIRSTRIP ON FARM NO. 417, GROOTVLEI, TULBAGH	24G	KARWEIDERSKRAAL TRUST	

19/11/2007	PROPOSED RESIDENTIAL DEVELOPMENT ON ERF NO. 1491, HAGLEY, BLUE DOWNS	AMENDMENT	MEIPROPS 22 (PTY) LTD	
27/07/2010	THE ESTABLISHMENT OF A SERVICE TRADE AREA ON FARM GROENFONTEIN NO. 716/16, PAARL	BAR	HELU PARK (PTY) LTD	
09/06/2010	THE DEVELOPMENT OF A RETIREMENT VILLAGE ON ERF NO.1738, MONTAGU	BAR	REALTY DYNAMIX 104 (PTY) LTD	
22/08/2011	UPGRADE OF THE DWARSKERSBOS SEWERAGE TREATMENT WORKS: PORTION 4 OF THE FARM 109 DWARSKERSBOS, BERGRIVIER MUNICIPALITY	EIA	BERGRIVIER MUNICIPALITY	
20/06/2012	THE DEVELOPMENT ON MEERENDAL PORTION 1 OF FARM NO. 159, DURBANVILLE.	BAR	MEERENDAL WINE ESTATE (PTY) LTD	<u>Secondary EAP</u> Main Author of all reports (reviewed by Doug Jeffery) Liaised with Authorities, Organs of State, Public Consultation and Specialists Conducted PPP
16/03/2011	CONSTRUCTION OF A SEWERAGE PIPELINE TO SERVE DRIFTSANDS	BAR	CITY OF CAPE TOWN	
24/11/2009	THE REZONING AND SUBDIVISION OF ERF NO. 21973, KHAYELITSHA	BAR	NU-WAY HOUSING DEVELOPMENTS (PTY) LTD	
24/11/2010	DAL JOSAFAT DEVELOPMENT ON ERF NO. 16161 AND REMAINDER OF ERF NO. 17680, PAARL	EIA	ERF 16161 PAARL DEVELOPMENT (PLY} LID	
21/07/2009	THE PROPOSED USE AND/OR DISPOSAL OF SEDIMENT FROM ZEEKOEVLEI, CAPE FARM NOS. 848-0, 840-1, 847-01, 846-0, 844-31, 837-0, 838-0 AND ERF 93284, ZEEKOEVLEI NATURE RESERVE	BAR	CITY OF CAPE TOWN	

ANNEXURE 2: LOCALITY PLAN

Kleinfontein: Topographical Map



Legend

Property Boundary

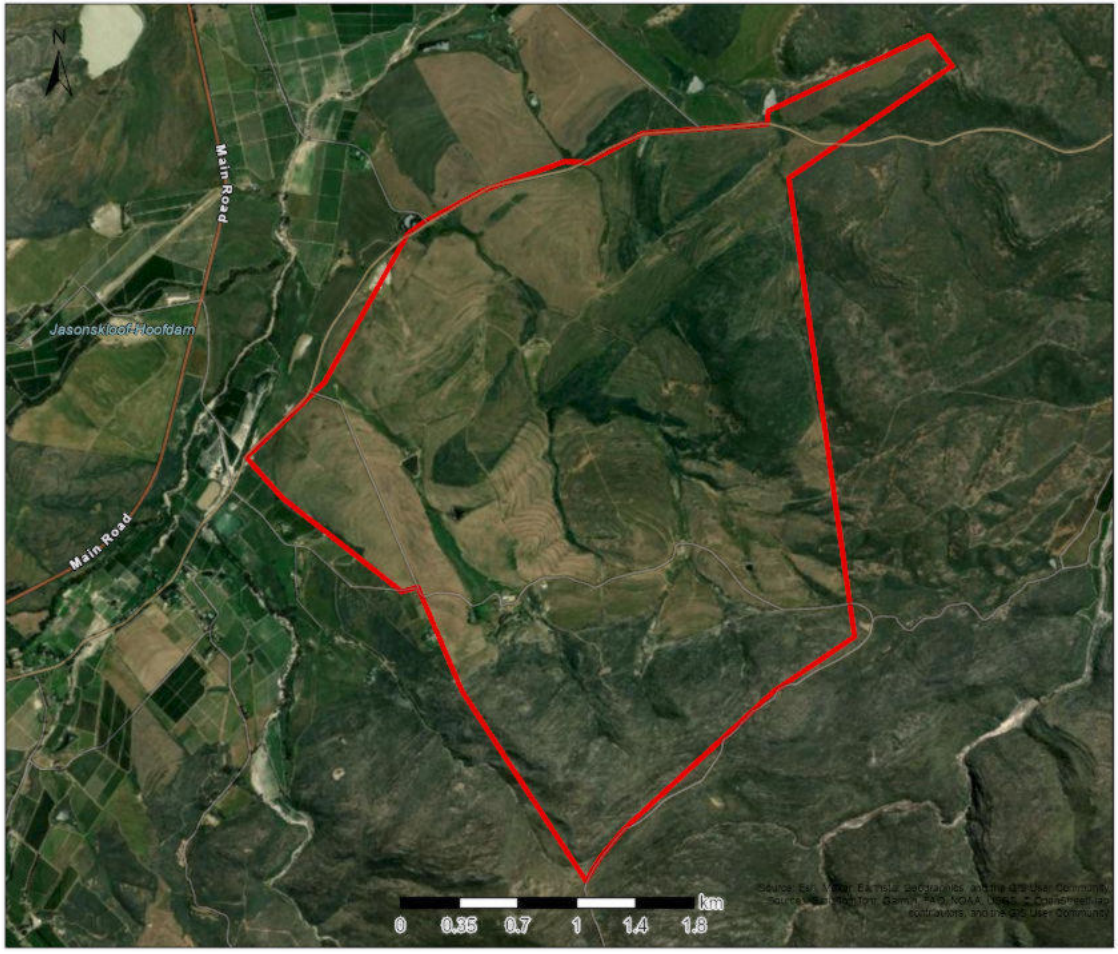
Map Center: Lon: 19°23'47.6"E
Lat: 33°54'42.4"S

Scale: 1:36,112

Date created: 2025/13/10

Western Cape Government
FOR YOU

Locality Map 1



Legend

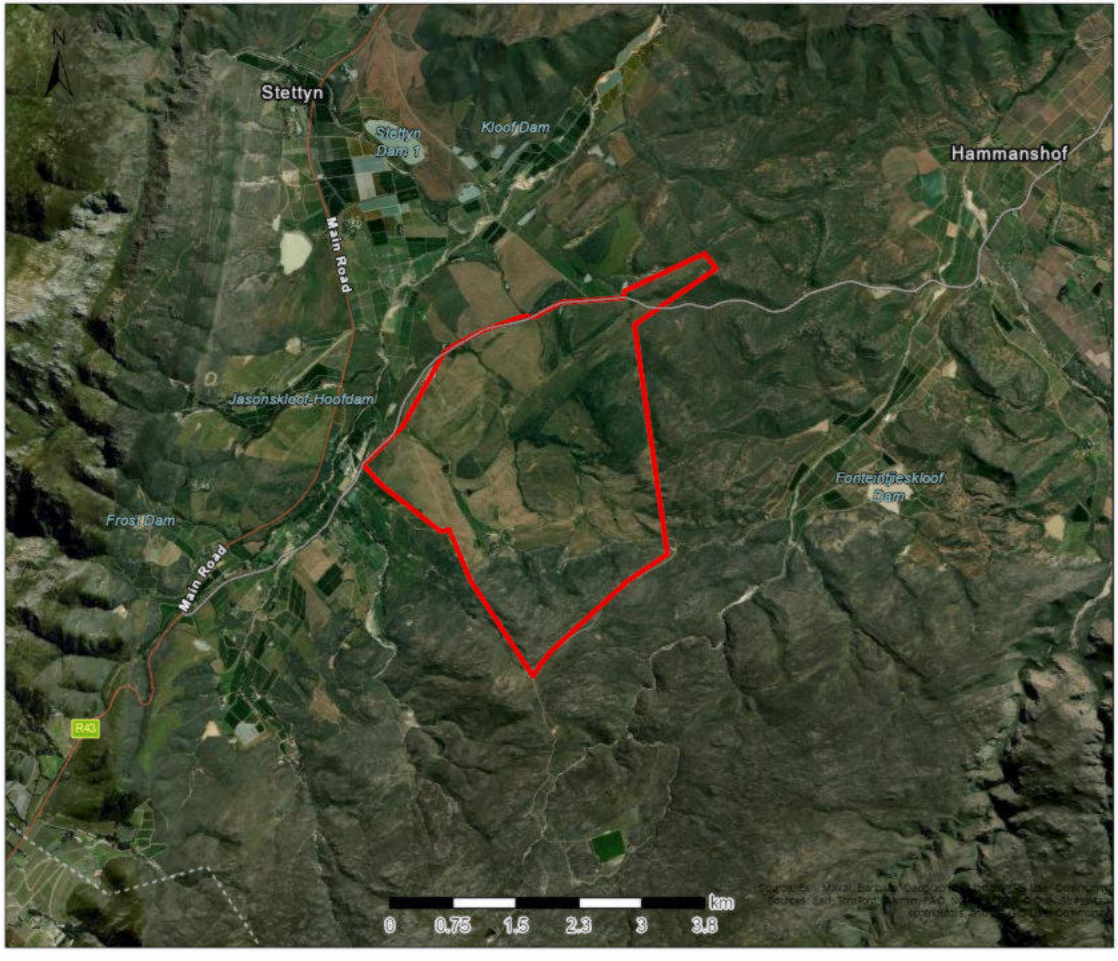
Map Center: Lon: 19°23'19.8"E
Lat: 33°54'47.8"S

Scale: 1:36,112

Date created: 2025/26/05

Western Cape Government
FOR YOU

Locality Map 2



Legend

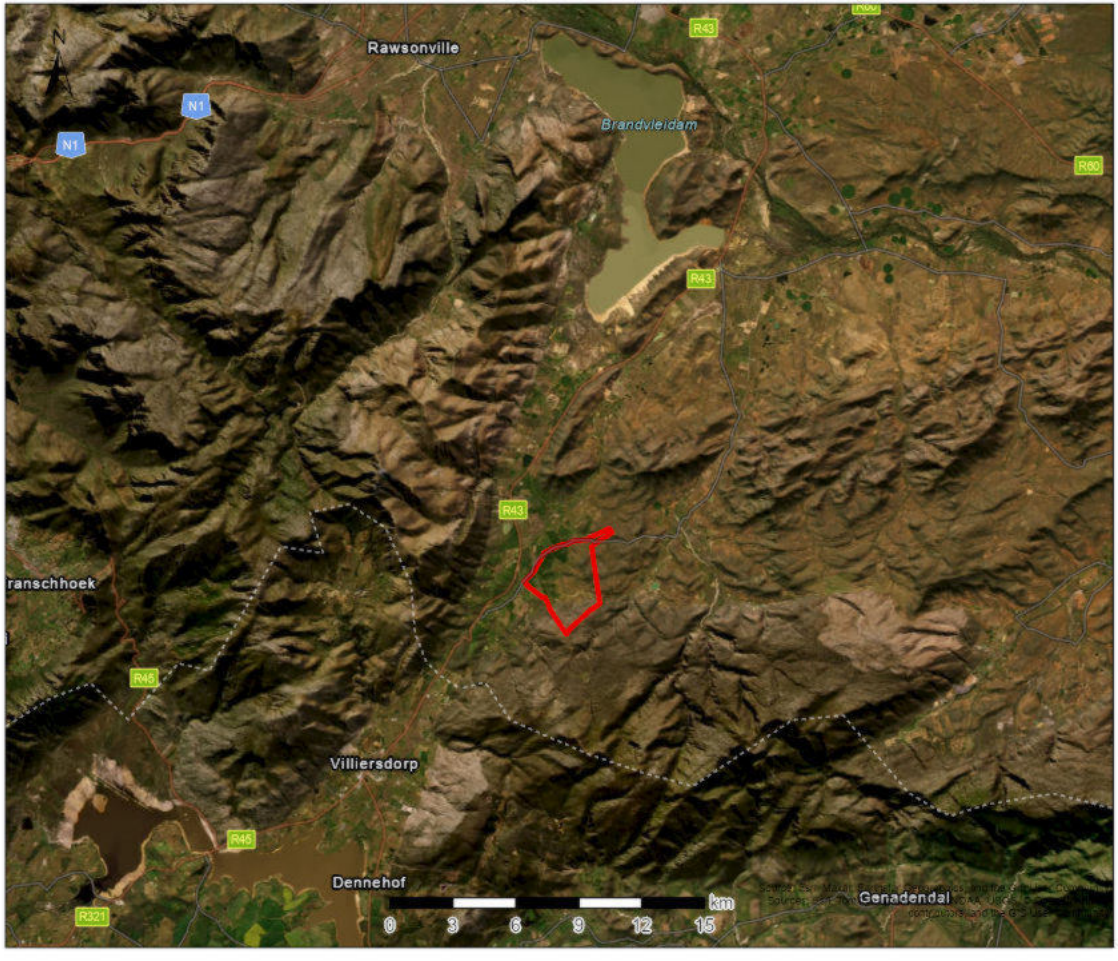
Map Center: Lon: 19°23'38.2"E
Lat: 33°54'48.6"S

Scale: 1:72,224

Date created: 2025/26/05

Western Cape Government
FOR YOU

Locality Map 3



Legend

Map Center: Lon: 19°23'13.2"E
Lat: 33°52'1.9"S

Scale: 1:288,895

Date created: 2025/26/05

Western Cape Government
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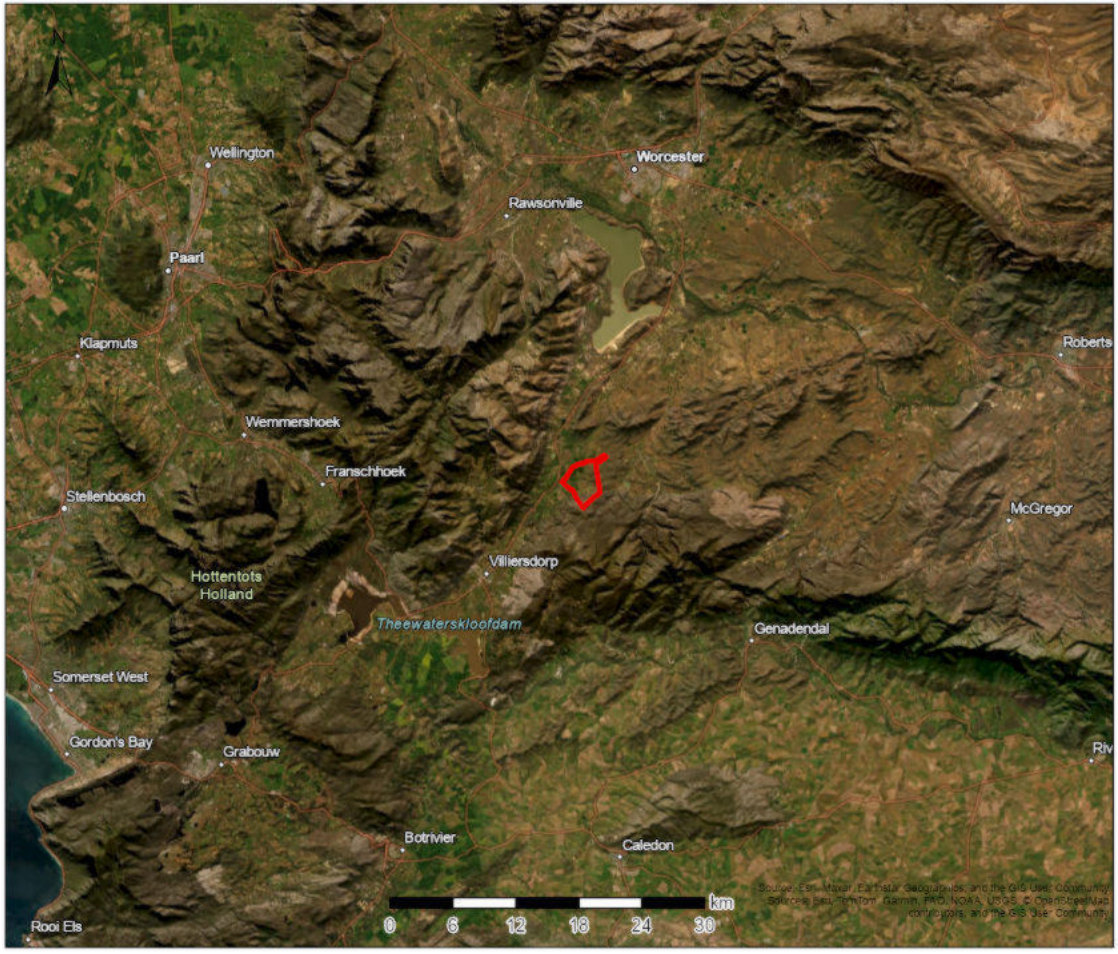
Locality Map 4



Legend

Map Center: Lon: 19°21'57.8"E
Lat: 33°54'25.5"S

Scale: 1:577,791

Date created: 2025/26/05

Western Cape Government
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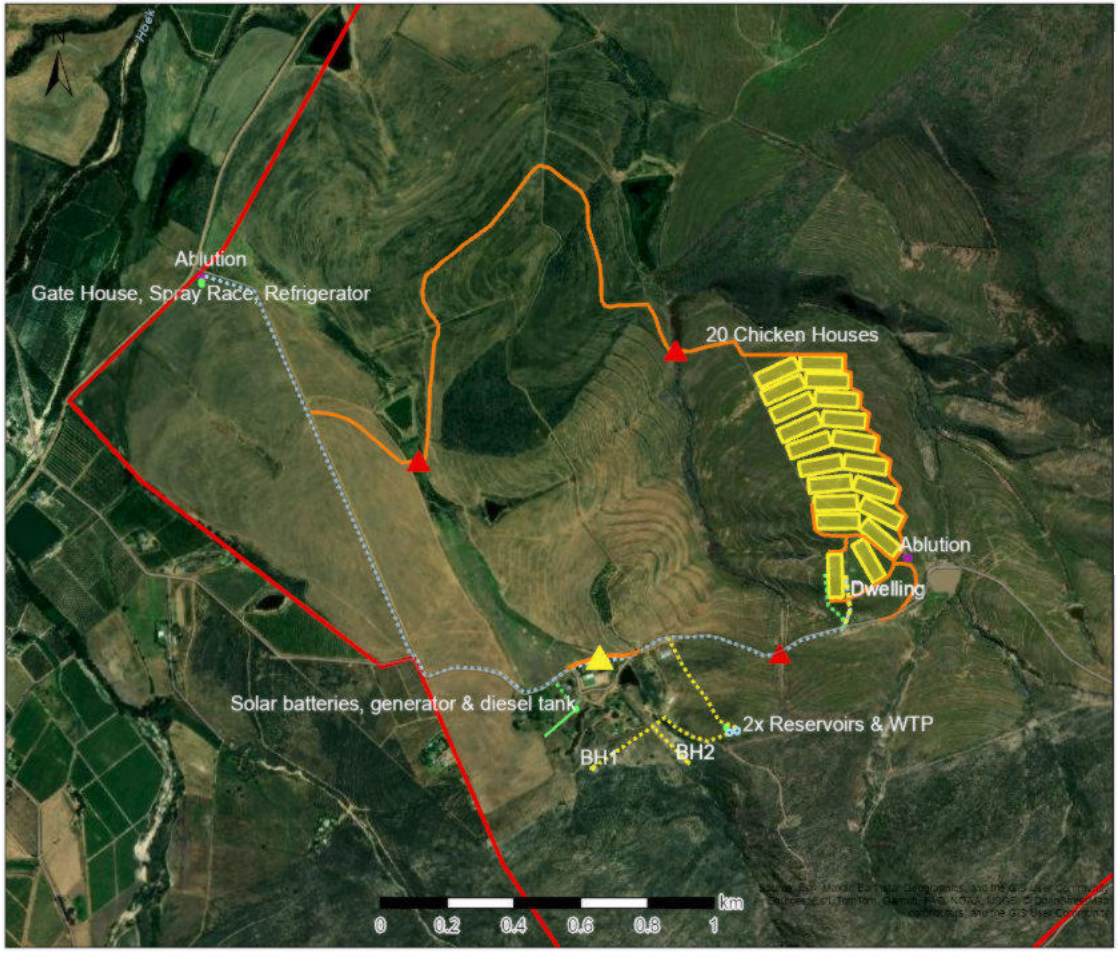
ANNEXURE 3A: SITE DEVELOPMENT PLAN

Kleinfontein Broiler Facility: Site Plan



Legend

- Property Boundary
- New Road
- Electrical Cable (trenched)

Yellow dotted line = water pipeline (trenched)

Green dotted line = electrical overhead line

Blue/Grey dotted line = water pipeline (trenched) & electrical overhead line route

Low water bridges

Suspended Bridge

Map Center: Lon: 19°23'4.1"E
Lat: 33°54'51.9"S

Scale: 1:18,056

Date created: 2025/22/10

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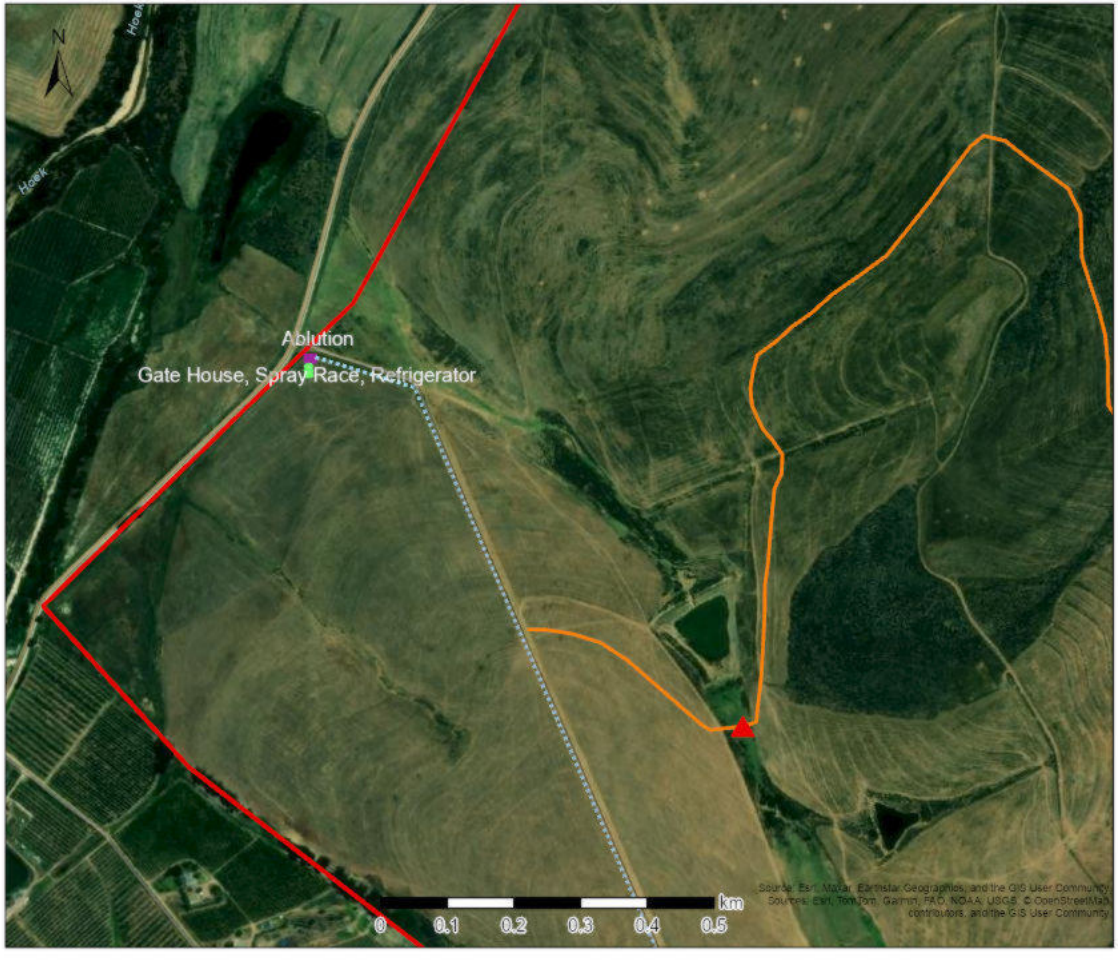
Kleinfontein Broiler Facility: Entrance



Legend

Low Water Bridge

Map Center: Lon: 19°22'37.2"E
Lat: 33°54'38.3"S

Scale: 1:9,028

Date created: 2025/22/10

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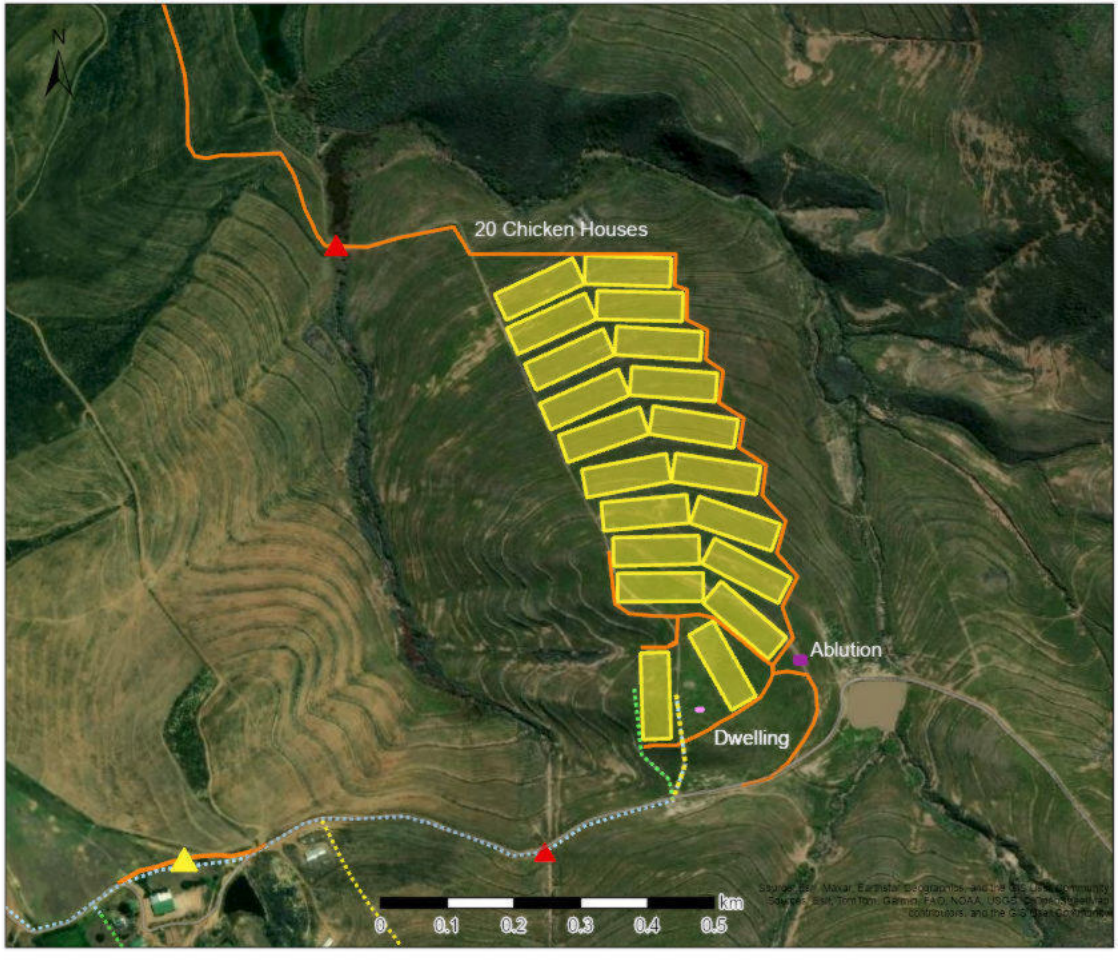
Kleinfontein Broiler Facility: Broiler Houses



Legend

Low water bridges

Suspended Bridge

Map Center: Lon: 19°23'30.5"E
Lat: 33°54'51.1"S

Scale: 1:9,028

Date created: 2025/22/10

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Kleinfontein Broiler Facility: Farmyard

Legend

Suspended bridge

stream crossing point

Map Center: Lon: 19°23'12.9"E
Lat: 33°55'12.6"S

Scale: 1:4,514

Date created: 2025/22/10

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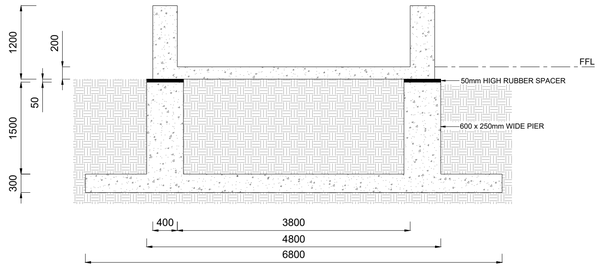
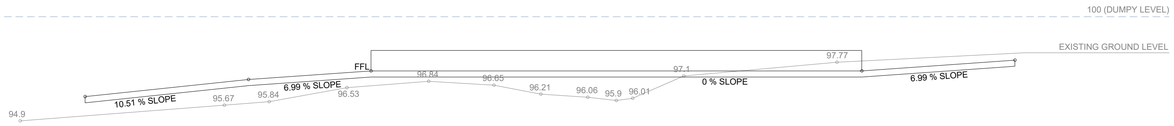
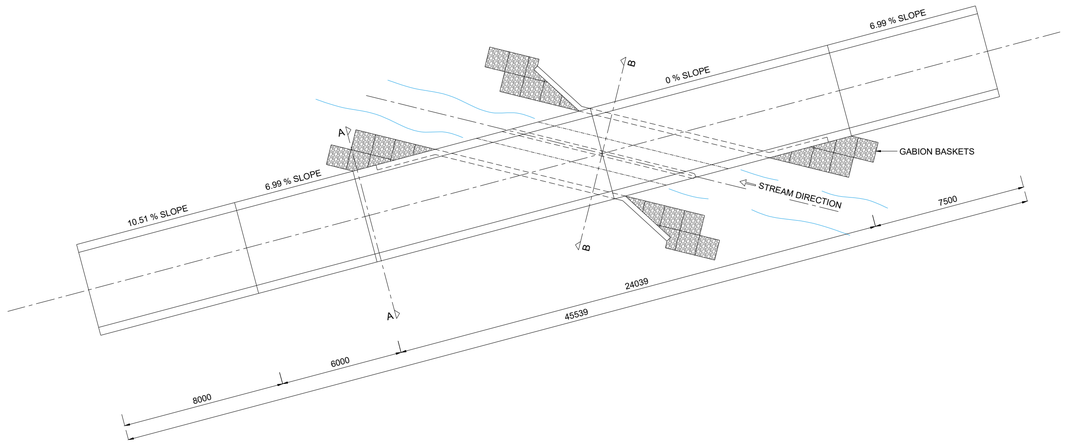


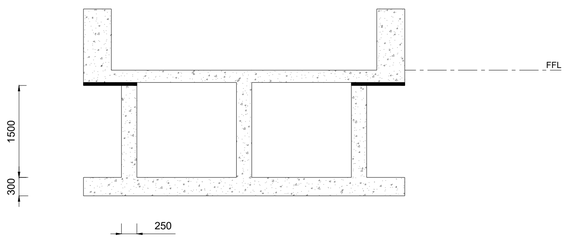
SECTION A-A
SCALE: 1:50



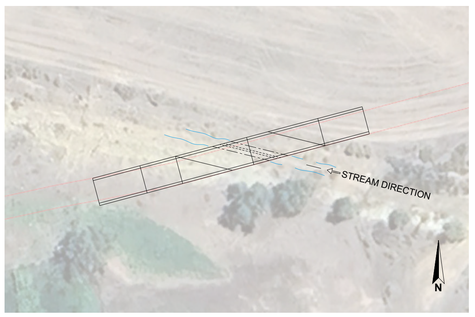
ELEVATION VIEW
SCALE: 1:150



PLAN VIEW
SCALE: 1:150



SECTION B-B
SCALE: 1:50



ON SITE VIEW
SCALE: 2:1

*NOTE: REFER TO FIGURE 1: MARKING NO 2 ON DESIGN REPORT.

LEGEND:

- CONCRETE

NOTES:

- DIMENSIONS IN MILLIMETERS.
- SITE SURVEYING AND MEASUREMENTS WERE DONE TO COMPLETE THESE DRAWINGS.
- THESE DRAWINGS ARE FOR INFORMATION AND NOT FINAL.

REV	DATE	DESCRIPTION	BY
R01	01-08-2025	ADDITIONS MADE	TR
R00	10-07-2025	INFORMATION	TR

REVISIONS

By:

FORE

FORE ENGINEERING SOLUTIONS (PTY) LTD

TEL: (+27) 21 569 4360
E-MAIL: info@foreng.co.za
ADDRESS: Klein Joostenberg Farm, Die Steeg 1, R304, Muldersvlei, Stellenbosch, 7606

Pr Eng | Date

Client

KLEINFONTEIN

BRIDGE DETAIL

USE

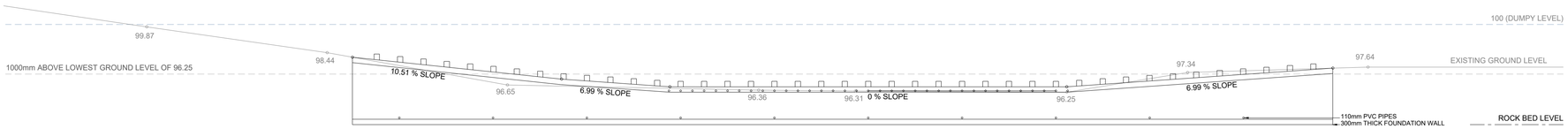
INFORMATION

DRAWN	DATE	CHECKED	SCALE
TR	10-07-2025	WV/TR	AS SHOWN

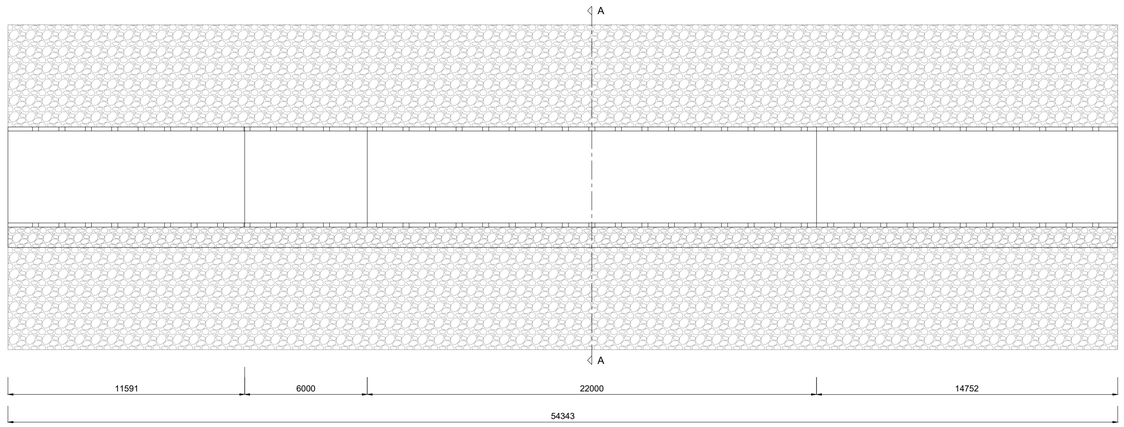
DRAWING NUMBER

F 2 5 0 1 7 | I | 0 0 3 | R 0 1

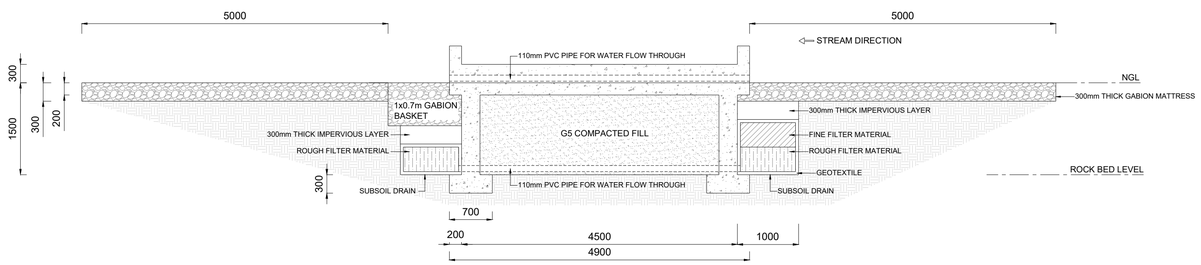
PROJECT NUMBER | DISC | DRAWING CODE | REVISION



ELEVATION VIEW
SCALE: 1:150



PLAN VIEW
SCALE: 1:150



SECTION A-A
SCALE: 1:50

*NOTE: REFER TO FIGURE 1: MARKING NO 1 ON DESIGN REPORT.

ON SITE VIEW
SCALE: 2:1

LEGEND:

- CONCRETE

NOTES:

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REV	DATE	DESCRIPTION	BY
R01	01-08-2025	ADDITIONS MADE	TR
R00	10-07-2025	INFORMATION	TR

REVISIONS

By:

FORE

FORE ENGINEERING SOLUTIONS (PTY) LTD

TEL: (+27) 21 569 4360
E-MAIL: info@foreng.co.za
ADDRESS: Klein Joostenberg Farm, Die Steeg 1, R304, Muldersvlei, Stellenbosch, 7606

Pr Eng | Date

Client

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LOW WATERWAY BRIDGE 1 DETAIL

USE

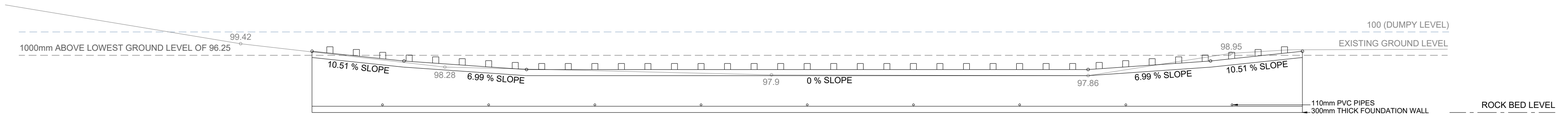
INFORMATION

DRAWN	DATE	CHECKED	SCALE
TR	10-07-2025	WV/TR	AS SHOWN

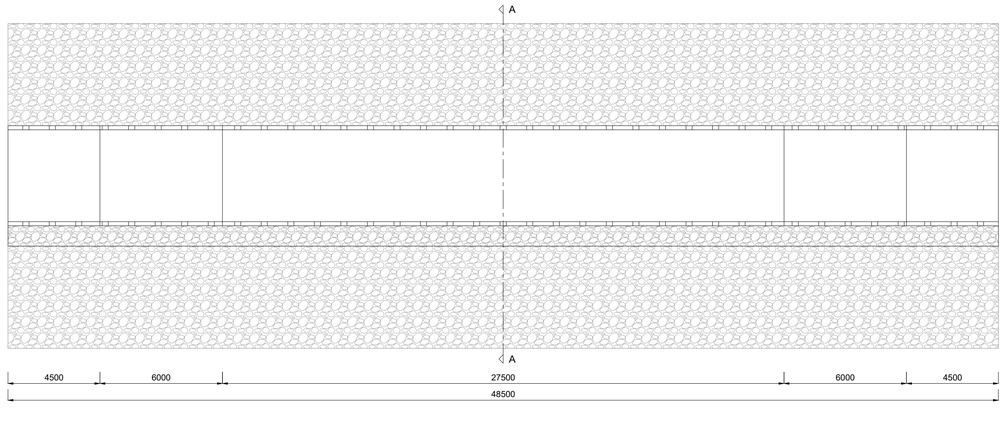
DRAWING NUMBER

F 2 5 0 1 7 I 0 0 1 R 0 1

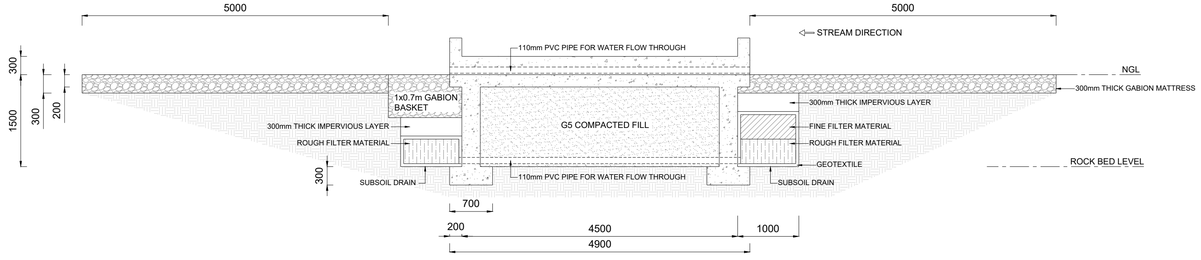
PROJECT NUMBER | DISC | DRAWING CODE | REVISION



ELEVATION VIEW
SCALE: 1:150



PLAN VIEW
SCALE: 1:150



SECTION A-A
SCALE: 1:50

*NOTE: REFER TO FIGURE 1: MARKING NO 4 ON DESIGN REPORT.

ON SITE VIEW
SCALE: 2:1

LEGEND:

- CONCRETE

NOTES:

- DIMENSIONS IN MILLIMETERS.
- SITE SURVEYING AND MEASUREMENTS WERE DONE TO COMPLETE THESE DRAWINGS.
- THESE DRAWINGS ARE FOR INFORMATION AND NOT FINAL.

REV	DATE	DESCRIPTION	BY
R01	01-08-2025	ADDITIONS MADE	TR
R00	10-07-2025	INFORMATION	TR

REVISIONS

By:

FORE

FORE ENGINEERING SOLUTIONS (PTY) LTD

TEL: (+27) 21 569 4360
E-MAIL: info@foreng.co.za
ADDRESS: Klein Joostenberg Farm, Die Steeg 1, R304, Muldersvlei, Stellenbosch, 7606

Pr Eng | Date

Client

KLEINFONTEIN

LOW WATERWAY BRIDGE 2 DETAIL

USE

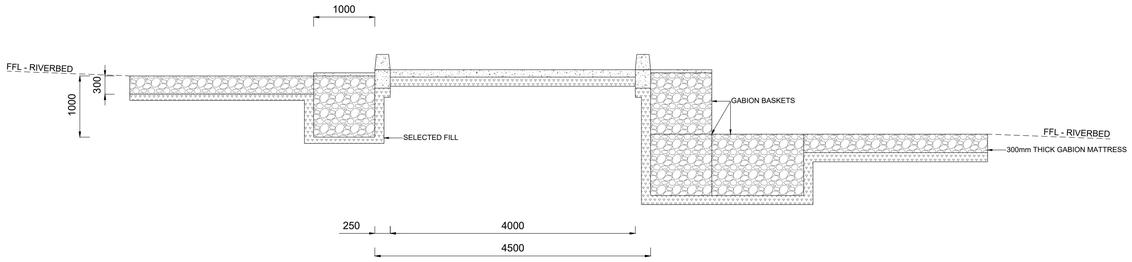
INFORMATION

DRAWN	DATE	CHECKED	SCALE
TR	10-07-2025	WV/TR	AS SHOWN

DRAWING NUMBER

F 2 5 0 1 7 I 0 0 2 R 0 1

PROJECT NUMBER | DISC | DRAWING CODE | REVISION



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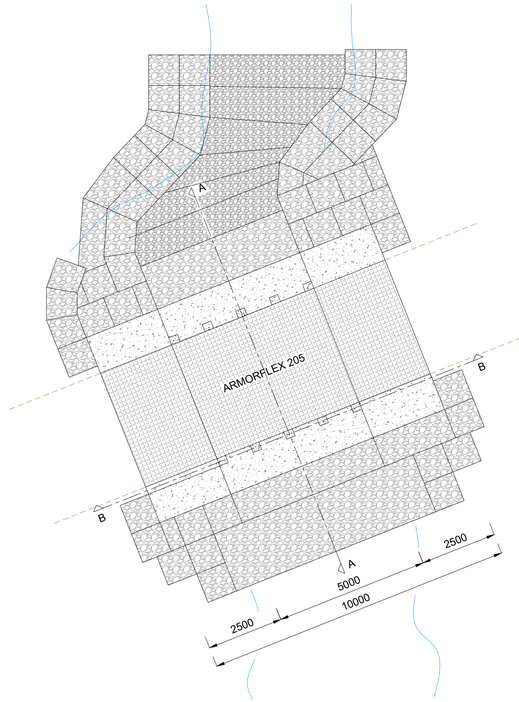

PLAN VIEW
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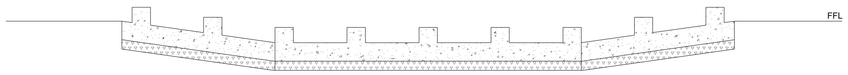

SECTION B-B
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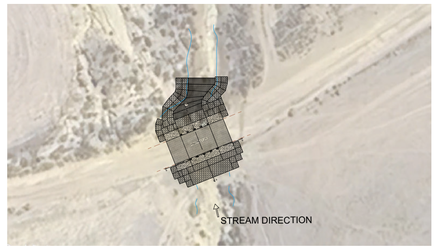

ON SITE VIEW
SCALE: 2:1

N

*NOTE: REFER TO FIGURE 1: MARKING NO 3 ON DESIGN REPORT.

LEGEND:

- CONCRETE

NOTES:

- DIMENSIONS IN MILLIMETERS.
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REV	DATE	DESCRIPTION	BY
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R00	10-07-2025	INFORMATION	TR

REVISIONS

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E-MAIL: info@foreng.co.za
ADDRESS: Klein Joostenberg Farm, Die Steeg 1, R304, Muldersvlei, Stellenbosch, 7606

Pr Eng | Date

Client

KLEINFONTEIN

STREAM CROSSING DETAIL

USE

INFORMATION

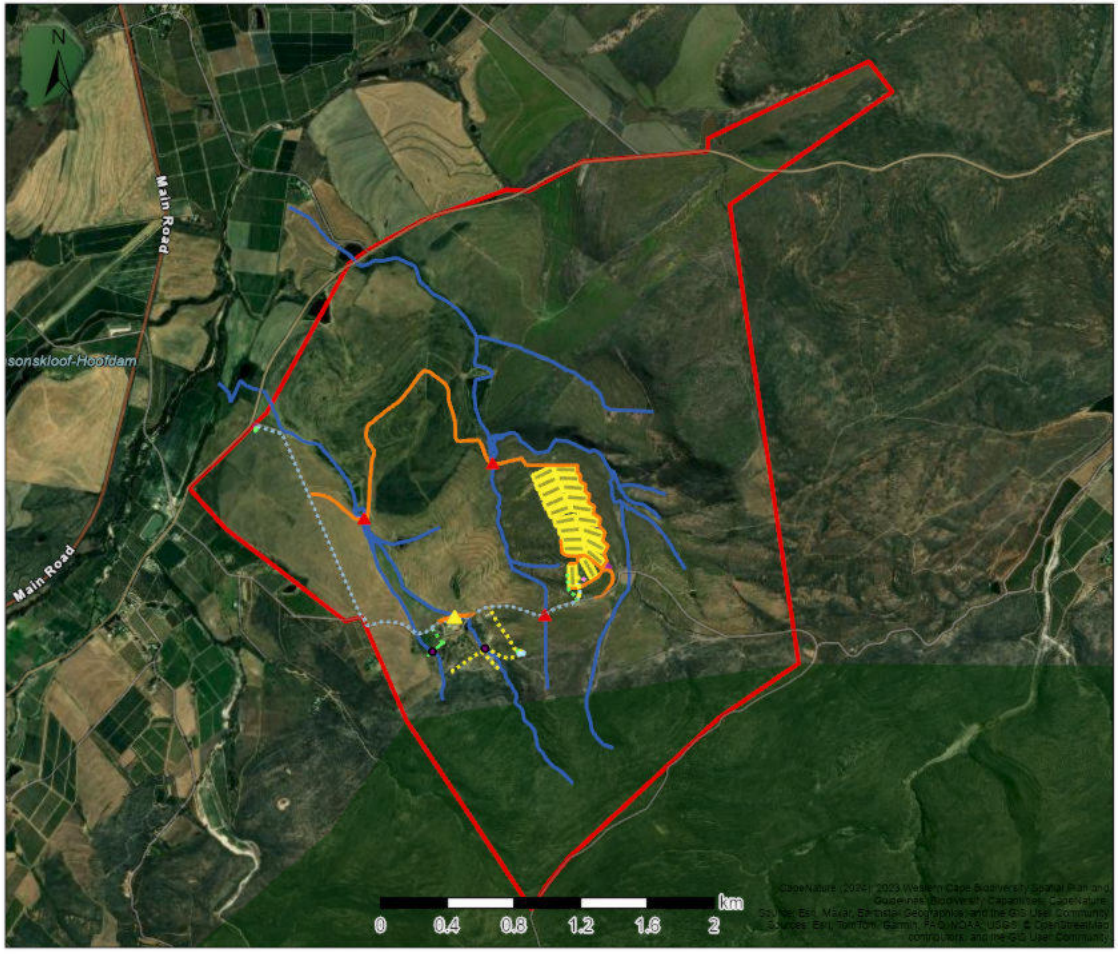
DRAWN	DATE	CHECKED	SCALE
TR	10-07-2025	WV/TR	AS SHOWN

DRAWING NUMBER

F 2 5 0 1 7	I	0 0 4	R 0 1
PROJECT NUMBER	DISC	DRAWING CODE	REVISION

ANNEXURE 3B: ENVIRONMENTAL SENSITIVITY MAP

Kleinfontein Broiler Facility: Environmental Sensitivity Map



Legend

Protected Areas

Property Boundary

Freshwater Features

Triangles (4) = River Road Crossings

Purple dots (2) = cable/pipeline crossings

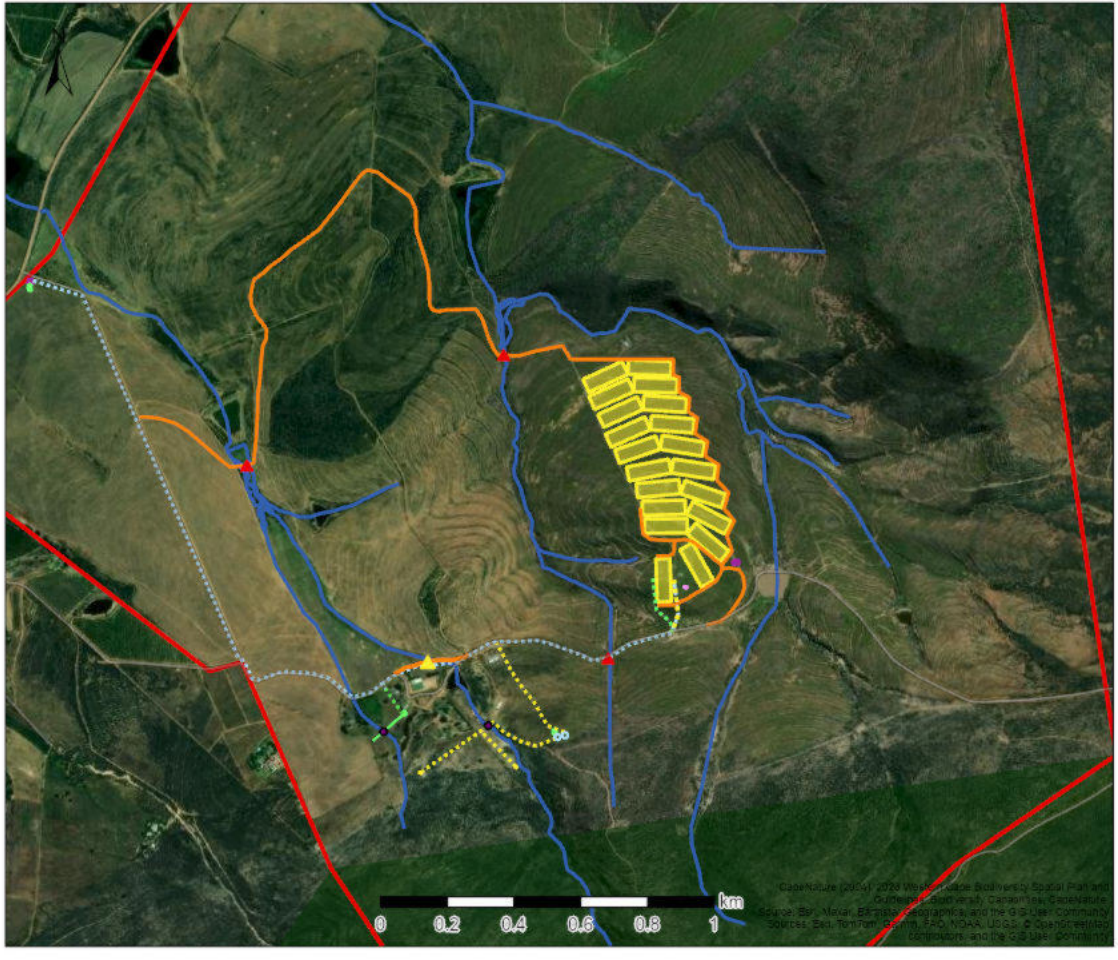
Map Center: Lon: 19°23'33.1"E
Lat: 33°54'42.4"S

Scale: 1:36,112

Date created: 2025/22/10

Western Cape Government
FOR YOU

Kleinfontein Broiler Facility: Environmental Sensitivity Map



Legend

Protected Areas

Map Center: Lon: 19°23'24"E
Lat: 33°54'51.5"S

Scale: 1:18,056

Date created: 2025/22/10

Western Cape Government
FOR YOU

Kleinfontein Broiler Facility: Environmental Sensitivity Map

Legend

Protected Areas

Map Center: Lon: 19°23'13.3"E
Lat: 33°55'14.3"S

Scale: 1:4,514

Date created: 2025/22/10

Western Cape Government
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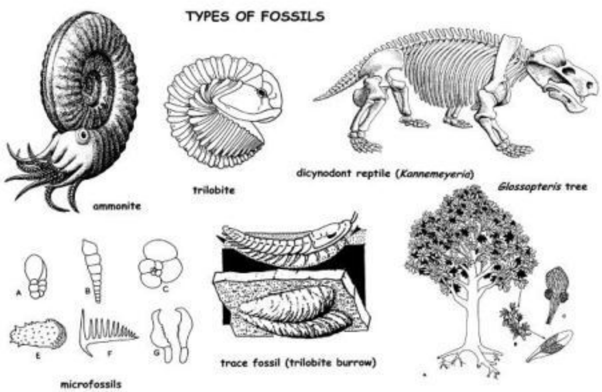
ANNEXURE 4: FOSSIL FINDS POSTER

Palaeontology: what is a fossil?

Fossils are the traces of ancient life (animal, plant or microbial) preserved within rocks and come in two forms:

- Body fossils preserve parts, casts or impressions of the original tissues of an organism (e.g. bones, teeth, wood, pollen grains); and
- Trace fossils such as trackways and burrows record ancient animal behaviour.



How to report chance fossil finds: What should I do if I find a fossil during construction/mining?

If you think you have identified a fossil:

Immediately inform the ECO or Site Agent. He/she will then contact HWC and write a report and if necessary operations will stop in that specific area until the fossil is recovered

Heritage Western Cape
ceoheritage@westerncape.gov.za
021 483 5959
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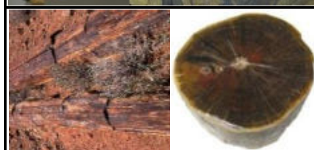
Types of palaeontological finding - What does a fossil look like?

Fossils vary in size, from fossilised tree trunks and dinosaur bones down to very small animals or plants. Finds can be **individual fossils** (one isolated wood log or bone) or **clusters and beds** (several bones, teeth, animal or plant remains, trace fossils in close proximity or bones resembling part of a skeleton). A bed of fossils is a layer with many fossil remains.

Below there is a list of few examples of fossils which may be identified during excavations in the Western Cape.

Image	Description	Image	Description
	Leaves		Snail shells and other shells
	Fossil wood		Bones of larger animals
	The remains of fish and marine life (e.g. teeth, scales, starfish)		Large burrows made by moles and other animals
	Stromatolites		Traces made by burrowing insects (ants, wasps, dung-beetles etc.).
	Animal footprints		

Images provided by Dr John Almond

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