FINAL BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PLAN

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 FOR A WASTEWATER TREATMENT WORKS ON PORTION 73 (SUBDIVIDED PORTION 10) OF THE FARM TRICHARDTSFONTEIN 140 IS, MPUMALANGA REGION.

NAME OF APPLICANT: TERRA NOVA UTILITIES
TEL NO: 086 186 5826
POSTAL ADDRESS: POSTNET SUITE 293, PRIVATE BAG X1007, LYTTELTON
PHYSICAL ADDRESS:
TERRA NOVA ESTATE, TRIDCHARDT, SECUNDA, GERT SIBANDE DISTRICT MUNICIPALITY, MPUMALANGA PROVINCE

FILE REFERENCE NUMBER: DARDLEA 1/3/1/16/1G-113

July 2019

BECS Environmental (Pty) Ltd
In association with BECS Services (Pty) Ltd

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Executive summary

Applicant

BECS Environmental has been appointed by Terra Nova Utilities (TNU) to apply for a basic assessment as part of the construction of a sewerage works. Part of the service agreement with Govan Mbeki Municipality when Terra Nova Township (Town) was established is that it will be self-administered. This means that Terra Nova is basically a Private Town which is administered by the Terra Nova Homeowners Association (TNHOA).

TNU was established and contracted by TNHOA to provide the Town with basic utilities: Electricity, water, sewerage and refuse removal. The Towns water comes from Rand Water. Electricity is supplied by Govan Mbeki Municipality. Currently, Govan Mbeki Municipality also service the Town's sewerage.

Refer to Table 1 below for a description of the applicant, and Table 2 for a description of the landowner of the site, Portion 73 (a division of portion 10) of the farm Trichardtsfontein 140 IS).

Table 1: Description of the applicant

Project applicant	Terra Nova Utilities
Trading name	Terra Nova Utilities (TNU)
Contact person	Carel Janse van Rensburg
Telephone number	086 186 5826
E-mail address	carel@voltano.com

Table 2: Description of the landowner

Landowner	ECENCICO (Pty)Ltd
Contact person	Marnus van Zyl
Cell phone number	082 883 2751
E-mail address	tony@bluecor.co.za

Project description

TNU is currently operational and proposes the construction of a wastewater recycling plant on Portion 73 which was subdivided from Portion 10 of the Farm Trichardtsfontein 140 IS. The construction of the wastewater recycling plant requires a Basic Assessment process to be conducted for the activities that are listed under the National Environmental Management Act No 107 of 1998 (as amended) (NEMA). A Water Use License is also necessary for the construction of a sewerage works and a Water Use License Application (WULA) is currently underway.

Legal requirements

According to Section 24(2) and 24(5) of the National Environmental Management Act No 107 of 1998 (as amended) (NEMA):

'The Minister, or an MEC with the concurrence of the Minister, may identify (a) activities which may not commence without environmental authorisation(EA) from the competent authority; (b) geographical areas based on environmental attributes, and as specified in spatial development tools adopted in the prescribed manner by the Minister or MEC, with the concurrence of the Minister, in which specified activities may not commence without EA from the competent authority.

The Minister, or an MEC with the concurrence of the Minister, may make regulations consistent with subsection (4) laying down the procedure to be followed in applying for, the issuing of and monitoring compliance with EAs.'

PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

a) Details of the Environmental Assessment Practitioner

This section includes the following:

i. Details of the EAP;
ii. Expertise of the EAP, which includes the qualifications of the EAP (with evidence) and a summary of the EAP's past experience - in carrying out the EIA Procedure; and
iii. A declaration that the EAP is independent in a form as may be specified by the competent authority

BECS Environmental was appointed as an independent consultant (EAP) to meet the requirements as set out in regulation 13 of the EIA Regulations. Refer below to a description of the EAP and refer to Addendum 2 for a detailed CV of the EAP, which includes the expertise including qualifications and past experience.

Table 3: Description of the environmental assessment practitioner

Name of company	BECS Environmental
Postal address	PO Box 72960, Lynnwood Ridge, 0040
Telephone number	012 361 9970
Cell phone number	072 191 6074
Facsimile number	012 361 0645
E-mail address	salome@becsenv.co.za
Name of reviewer EAP	Salome Beeslaar
Expertise of EAP	B.Sc Environmental Science (UP), B.Sc Honours Geography (UP), M.Sc Geography (UP), Professional Scientist (Environmental Science)
Name of responsible EAP	Deshree Pillay
Expertise of EAP	B. Sc Environmental Science (UP), B. Sc Honours Geography & Environmental Science (UP)

I, Deshree Pillay (9505080248080), hereby declare that I have no conflict of interest related to the work of this report. Specially, I declare that I have no business, personal, or financial interests in the property and/or mining right being assessed in this report, and that I have no personal or financial connections to the relevant property owners, or mine. I declare that the opinions expressed in this report are my own and a true reflection of my professional expertise and that there are no circumstances that may compromise my objectivity in performing such work.

_____

Deshree Pillay
BSc Hons– Geography and Environmental Sciences
July 2019

b) Location of the overall activity

TNU is located within the Govan Mbeki Municipal Area. The Govan Mbeki Municipal Area is situated within the Gert Sibande District Municipality, the south – eastern part of the Mpumalanga Province. Secunda is the seat of the municipality. The major towns in Govan Mbeki are Bethal, Charl Cilliers, Embalenhle, Evander, Kinross, Leandra, Secunda and Trichardt. Neighbouring Local Municipalities within the Mpumalanga Province are Dipalaseng and Lekwa to the south, Victor Khanye, Emalahleni and Steve Tshwete to the north and Msukaligwa to the east. Gauteng Province is situated to the west. As requested by SASOL, even though the project is on a portion of portion 10 of the Farm Trichardtsfontein 140 IS, this report will reflect to subdivided portion number, ie portion 73 of the Farm Trichardtsfontein 140 IS.

Table 4: Farm names, 21-Digit Surveyor General codes, and coordinates

Farm Name	Portion 73 of subdivided Portion 10 of the Farm Trichardtsfontein 140 IS.
Property area (Ha)	17.86ha
Development footprint area (Ha)	0,36ha
Magisterial district	Gert Sibande District Municipality
Distance and direction from nearest town	1,17km of the N17 towards Trichardt
21-digit Surveyor General Code for each farm portion	Portion 73 of the farm Trichardtsfontein 140 IS: T0IS00000000014000073
Coordinates	S26^0.28’ 48.17”, E29^0.13’46.83”

c) Locality map

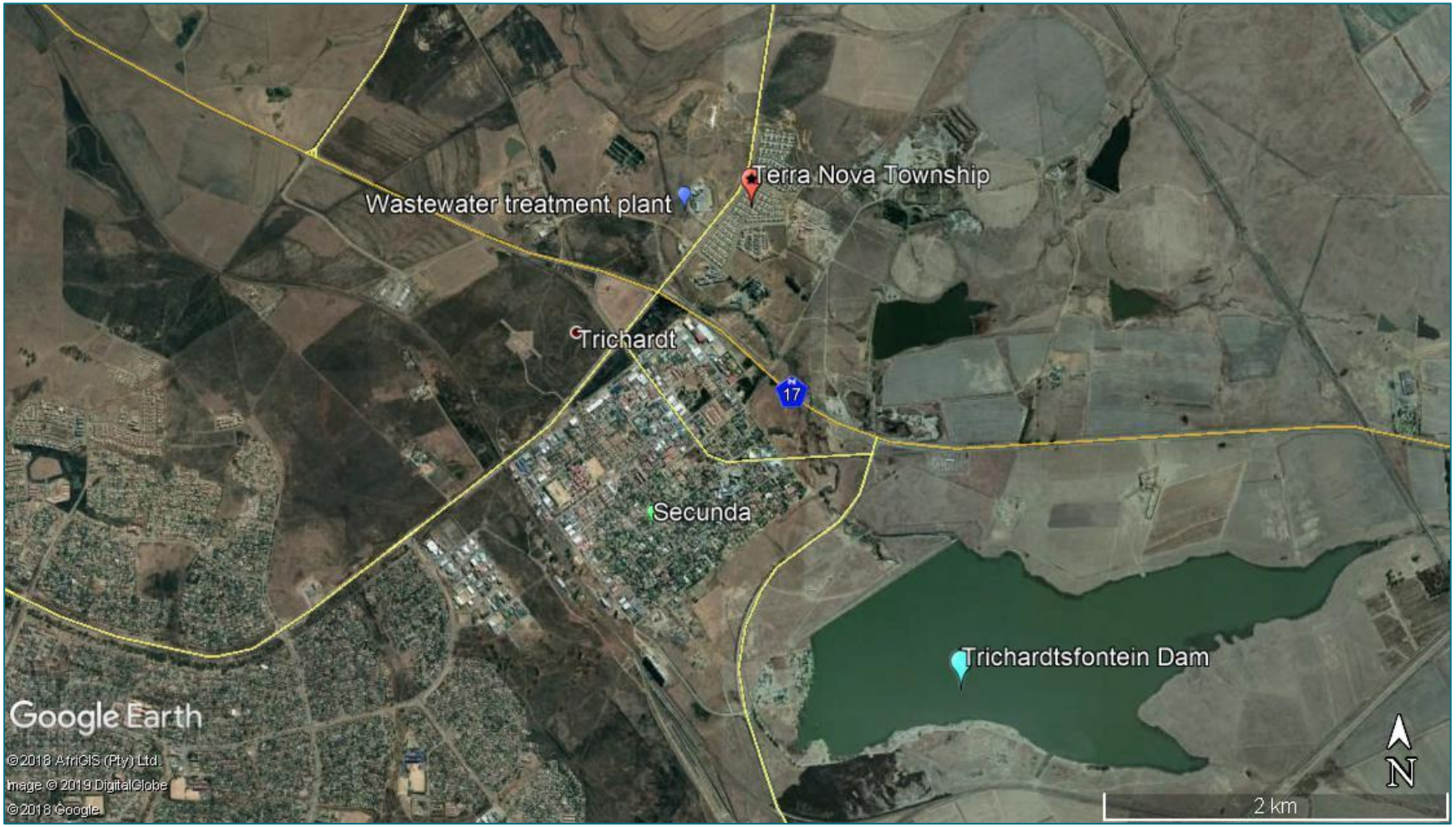

Figure 1: Locality map of the wastewater recycling plant

d) Description of the scope of the proposed overall activity

(i) Listed and specified activities

Refer to Table 5 below for a list of the specified activity applied for.

Table 5: Specified activity applied for

Name of activity	Aerial extent of the activity	Listed activity	Applicable listing notice
Basic assessment: The development of infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse	The Wastewater Recycling plant will be located within 32m from the drainage line.	12(ii)	GNR 983

(ii) Description of the activities to be undertaken including associated structures and infrastructure

The utilisation of treated water from the Wastewater Recycling plant in activities such as Aquaponics and Hydroponics and irrigation of the gardens within the Estate. The infrastructure associated with the Water Recycling plant are a Sewage package plant, three fishponds connected to a hydroponic farm.

e) Policy and legislative context

Applicable legislation and guidelines used to compile the report	Description of legislation and guidelines used to compile the report (reference and description)	Reference where applied	How does this development comply with and respond to the policy and legislative context (significance)
Authorisation applications			
NEMA and the Environmental Conservation Act 73 of 1989 as amended (ECA)	The first listed activities which required an EA (referred to as a record of decision (RoD) in the past) commenced in 1998. These activities were published in the EIA Regulations of 1998 (GN1183). In 2006, the ECA activities and EIA Regulations were replaced by the first NEMA EIA Regulations. The second set of NEMA EIA activities replaced the first set of NEMA EIA activities in 2010. The third set of NEMA EIA activities commenced on 8 December 2014. According to these listings, a	Part A(d)(i)	This basic assessment application includes a listed activity under NEMA.

Applicable legislation and guidelines used to compile the report	Description of legislation and guidelines used to compile the report (reference and description)	Reference where applied	How does this development comply with and respond to the policy and legislative context (significance)
	Basic Assessment should be conducted if an activity on listing notice 1 or 3 is triggered. If an activity on listing notice 2 is triggered, then a full Environmental Impact Assessment (EIA) is required.		
National Water Act No 36 of 1998, (NWA)	Section 21 of the NWA sets out the water uses for which an IWUL is required. These water uses commenced on 1 October 1998, and include permissible water uses (water uses for which no licensing or registration is necessary), general authorisations (GA) (water uses for which registration only is required), and water use licenses (water used for which both registration and licensing is required). An existing lawful water use is any water use that commenced 2 years or more prior to the NWA and authorised under the old Act. These water uses are deemed lawful. In 1999, the GN 704 Regulations i.t.o. NWA was published.	Addendum 5 Please note the application is still an ongoing process.	The developer is currently applying for a WUL for a Section 21(g) and Section 21(e) General Authorisation and a Section 21(a), (b), (c), (i) Water Use License. A site meeting was held on the 18th March 2019 and a reference number will be issued upon receival of the WUL. The WULA was uploaded onto the DWS e-WULAAS.
NEMAQA	A list of activities which need an AEL was published in 2010 (GN 248 of 2010 i.t.o. the NEMAQA. This list was updated in 2013 (GN 893 of 2013 i.t.o. NEMAQA). These lists further included compliance timeframes for plant emission standards, whereby new plant had to comply to new plants emission standards on 1 March 2010; existing plants had to comply with existing plant standards on 1 March 2015, and existing plants have to comply with new plants standards on 1 March 2020.	N/A	This is not applicable to the development.

Applicable legislation and guidelines used to compile the report	Description of legislation and guidelines used to compile the report (reference and description)	Reference where applied	How does this development comply with and respond to the policy and legislative context (significance)
NEMWA	Waste management permits for certain waste activities were required form 1989 i.t.o. the ECA. These permits were repealed by the publishing of the first listed waste management activities licensing in 2009 (GN 718 of 2009 i.t.o. NEMWA). These listings were replaced by new listings in 2013 (GN 921 of 2013 i.t.o. NEMWA). If a site has a permit under ECA, this is still applicable until the National Department of Environmental Affairs (NDEA) requests an update under the new legislation (NEMWA).	N/A	This is not applicable to the development.
National Heritage Resources Act no 25 of 1999 (NHRA)	All required permits as per the Act.	N/A	Due to the size of the operation, this is currently not applicable to the proposed sewerage works. In the event of any heritage resource discovered, a qualified specialist will be appointed.
Section 15(1) of the National Forest Act No 84 of 1998 (NFA)	No person may cut, disturb, damage or destroy any protected tree; or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except under a licence granted by the Minister.	N/A	No protected flora was observed in the impacted area

f) Need and desirability of the proposed activities

As per the Guideline on Needs and Desirability in terms of the EIA Regulations (published 20 October 2014), the following table has been compiled:

Table 6: Need and Desirability of the proposed project

Guideline requirement	Comments on requirement
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	Threatened Ecosystems: Rand Highveld Grassland Threatened ecosystem code: Gm 11 Threatened ecosystem status: Vulnerable Sensitive, vulnerable, highly dynamic or stressed ecosystems: Govan Mbeki contains mainly the Grassland Biome. Grasslands within Govan Mbeki have irreversibly been transformed by mainly agriculture and mining. These land uses destroy biodiversity, but extensive livestock grazing can be reasonably biodiversity friendly, provided good management and safe stocking rates are applied. The Aquatic Ecology Assessment of The Proposed Terra Nova Wastewater Treatment Works (Limnology, 2019): stated that “A riparian area was observed on site. The system is in average condition (PES using WetHealth= C). The EIS of the system is also high (2.9). The impact assessment calculations determined the impact score to 10 (High): The project can be authorised but with strict conditions and high levels of compliance and enforcement in respect of the impact in question” Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"): ESA: FEPA sub catchments, cover approximately 3,47% of the total area. In terms of Critical Biodiversity Areas, CR rivers cover 14.33% and FEPA rivers cover 85.67%. Conservation targets: The development priorities providing focus to strategic development interventions support the crucial components that underlie sustainable development, i.e. need for basic infrastructure and development for the poor, economic growth and development, environmental conservation and improved livelihoods. The conservation of biodiversity, sustainable use of biological resources and the fair and equable sharing of benefits from the use of biodiversity within Govan Mbeki are protected by the: • South African Constitution (Act 108 of 1996) stating that everyone is entitled to an environment that is: • Not harmful to their health of wellbeing.
1.1 How were the following ecological integrity considerations taken into account?	
1.1.1 Threatened Ecosystems,	
1.1.2 Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure,	
1.1.3 Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),	
1.1.4 Conservation targets,	
1.1.5 Ecological drivers of the ecosystem,	
1.1.6 Environmental Management Framework,	
1.1.7 Spatial Development Framework, and	
1.1.8 Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	
1.2 How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	
1.3 How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	

Guideline requirement	Comments on requirement
	• Protected for the benefit of present and future generations through reasonable and other measures that prevent pollution and ecological degradation, promote conservation and secure the ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. <u>Ecological drivers of the ecosystem:</u> The ecosystem contains important aquatic ecosystems which provide important ecosystem services to the surrounding biotic and biotic environment. As a framework, the SDF addresses the following deliverables: appropriate densities, support of public transport, clustering and focus of economic activities, growth management, the enhancement and protection of residential environments, support of viable service and infrastructure provision, guiding and directing affordable housing developments, environmental management and provision of a framework for the upgrading and development of historic townships. (Govan Mbeki Municipality, 2014-2034) <u>Applicability to this development:</u> The development will ultimately reduce the current pollution of sewage into the aquatic ecosystems due to inadequate operations of the sewage works.
1.4 What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Building rubble will be generated as part of construction. All management measures are included in Section v. The screenings are taken by the municipality's Wastewater Treatment Works operator and disposed at the Wastewater Treatment Works as part of their screenings. The screening are disposed of at the municipality landfill site.
1.5 How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Heritage management measures will be implemented if any heritage resources are found. The heritage resources authority will be consulted, and a heritage impact assessment will be undertaken.

Guideline requirement	Comments on requirement
1.6 How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	This basic assessment application is for the construction of a sewerage works. No depletion of renewable or non-renewable resources are envisaged.
1.7 How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	
1.7.1 Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	
1.7.2 Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there	

Guideline requirement	Comments on requirement
more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)	
1.7.3 Do the proposed location, type and scale of development promote a reduced dependency on resources?	
1.8 How were a risk-averse and cautious approach applied in terms of ecological impacts?	All impacts have designated mitigation measures to ensure the impact is not severe and can be mitigated. All activities will be carried out in line with the plan of construction.
1.8.1 What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	No additional specialist studies will be conducted for this project unless specifically requested by the competent authority. The only study that will take place is the aquatic ecosystem delineation study. Therefore, information will be sourced from various existing documents.
1.8.2 What is the level of risk associated with the limits of current knowledge?	It is unclear what the level of risk will be on the various environmental components. However, impacts will be listed, and management measures stated.
1.8.3 Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	No additional risk-averse cautious approach will be followed.
1.9 How will the ecological impacts resulting from this development impact on people's environmental right in terms following	The project may cause a noise nuisance to the people in the area as construction will take place.
1.9.1 Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The community will have an increased access to adequate health and sanitation due to the construction of the sewerage works. Once the sewerage works is completed, it will prevent any effluent or discharge from entering the natural water sources in the area.
1.9.2 Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	
1.10 Describe the linkages and dependencies between human well-being, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on	

Guideline requirement	Comments on requirement
livelihoods, loss of heritage site, opportunity costs, etc.)?	
1.11 Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	
1.12 Considering the need to secure the ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	There is no alternative to this project. The no-go option is also assessed, which will ultimately have a more significant effect than the preferred alternative.
1.13 Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope, and nature of the project in relation to its location and existing and other planned developments in the area?	Refer to the cumulative impact assessment; Part A(H)(v)(3)
A. Promoting justifiable economic and social development	
2.1 What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	<u>The IDP and any other strategic plans, frameworks of policies applicable to the area:</u> The strategic objectives are as follow: (Govan Mbeki Local Municipality, 2018/2019) 1. To enhance revenue and secure financial stability 2. To provide sustainable services optimise operations and improve customer care 3. To facilitate and create an enabling environment for diversified local economic development, social cohesion and job creation 4. To enhance the capacity of human capital and deliver institutional transformation 5. To develop spatially integrated, safe communities and a protected environment <u>Spatial priorities and desired spatial patterns:</u> (Govan Mbeki Local Municipality, 2018/2019)
2.1.1 The IDP (and its sector plans' vision, objectives, strategies, indicators, and targets) and any other strategic plans, frameworks of policies applicable to the area,	
2.1.2 Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	
2.1.3 Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	
2.1.4 Municipal Economic Development Strategy ("LED Strategy").	
2.2 Considering the socio-economic context, what will the socio-economic impacts be of	

Guideline requirement	Comments on requirement
the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	
2.2.1 Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	The ultimate objective of this one holistic planning approach which commence with development of an SDF (that is inclusive of all current and future developments) is to inform and align operational plans ensuring planning is streamlined across sector departments. This approach eliminates duplication in the planning and budgeting processes ensuring that development transpires in a coordinated manner.
2.3 How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	<u>Spatial characteristics:</u> Natural areas within Govan Mbeki have irreversibly been transformed by mainly agriculture and mining. These land uses destroy biodiversity.
2.4 Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	<u>Municipal Economic Development Strategy:</u> The Govan Mbeki Local Municipality identified and commissioned the following key vision elements for economic development: • Creation of job opportunities. • Reduced dependency on government grants and reducing the poverty gap. • Economic growth based on key and diversified sectors. • SMME contribution to economic growth and development. • Creation of a district economic hub.
2.5. In terms of location, describe how the placement of the proposed development will: 2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other, 2.5.2. reduce the need for transport of people and goods, 2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport), 2.5.4. compliment other uses in the area, 2.5.5. be in line with the planning for the area, 2.5.6. for urban related development, make use of underutilised land available with the urban edge, 2.5.7. optimise the use of existing resources and infrastructure, 2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement), 2.5.9. discourage "urban sprawl" and contribute to compaction/densification,	<u>Development applicability:</u> The sewerage works will help increase the standards of health and sanitation in the area. This will provide social upliftment for the surrounding community as a new water provider will be present.

Guideline requirement	Comments on requirement
2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs, 2.5.11. encourage environmentally sustainable land development practices and processes, 2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.), 2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential), 2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and 2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	
2.6 How were a risk-averse and cautious approach applied in terms of socio-economic impacts? Level of risk associated with limits of current knowledge related to the following: Inequality, Social fabric, Livelihoods, Vulnerable communities, Critical resources, Economic vulnerability and Sustainability	Refer to the impact assessment; Part A(H)(v)(1)
2.6.1 What are the limits of current knowledge (note: the gaps, uncertainties, and assumptions must be clearly stated)?	IDPs, SDFs, and other published documents are used to determine the socio-economic aspects of the area.
2.6.2 What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability, and sustainability) associated with the limits of current knowledge?	A wetland delineation is conducted by a specialist. No other specialist studies were done due to the size of the development.

Guideline requirement	Comments on requirement
2.6.3 Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
2.7 How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	This project will not affect these aspects.
2.7.1 Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	
2.7.2 Positive impacts. What measures were taken to enhance positive impacts?	
2.8 Considering the linkages and dependencies between human well-being, livelihoods, and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	This basic assessment application is for the construction of a sewerage works. No depletion of renewable or non-renewable resources is envisaged.
2.9 What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	Environmental Health and Safety (EHS) risks and project hazards are identified as early as possible. Health and safety training will be done, and PPE will be provided.
2.10 What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	The construction of the sewage works will ultimately lead to the reduction of sewage waste released into the aquatic ecosystems.
2.11 What measures were taken to pursue equitable access to environmental resources, benefits, and services to meet	

Guideline requirement	Comments on requirement
basic human needs and ensure human well-being, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	
2.12 What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	
2.13 What measures were taken to:	Refer to Part A(H)(ii) for public participation.
2.13.1 ensure the participation of all interested and affected parties,	
2.13.2 provide all people with an opportunity to develop the understanding, skills, and capacity necessary for achieving equitable and effective participation,	
2.13.3 ensure participation by vulnerable and disadvantaged persons	
2.13.4 promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means	
2.13.5 ensure openness and transparency, and access to information in terms of the process	
2.13.6 ensure that the interests, needs, and values of all interested and affected parties were taken into account and that adequate recognition was given to all forms of knowledge, including traditional and ordinary knowledge, and	
2.13.7 ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein was be promoted	
2.14 Considering the interests, needs, and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing	

Guideline requirement	Comments on requirement
opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	
2.15 What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	All contractors, sub-contractors and workers will attend compulsory environmental awareness. This training will highlight the dangers associated with the workplace.
2.16 Describe how the development will impact on job creation in terms of, amongst other aspects:	This information will only be available once this application has been approved and the community has been consulted.
2.16.1 the number of temporary versus permanent jobs that will be created,	
2.16.2 whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	
2.16.3 the distance from where labourers will have to travel,	
2.16.4 the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	
2.16.5 the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but the impact on 1000 agricultural jobs, etc.).	
2.17 What measures were taken to ensure:	A summary of various legislation is included in Part A(e) of this report. All organs of state will receive this BAR. Any comments from them will be incorporated into the final decision. The community will be also involved in the procedural requirement.
2.17.1 that there were intergovernmental coordination and harmonisation of policies, legislation, and actions relating to the environment	
2.17.2 that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	
2.18 What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public	

Guideline requirement	Comments on requirement
interest, and that the environment will be protected as the people's common heritage?	
2.19 Are the mitigation measures proposed realistic and what long-term environmental legacy and the managed burden will be left?	Residual impacts are discussed in Part B(d)(i)(2) of this BAR.
2.20 What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	There are provisions made to ensure that environmental pollution does not occur.
2.21 Considering the need to secure the ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	There is no alternative to this project and the placement of the site was done in consultation with a SACNASP registered ecologist
2.22 Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope, and nature of the project in relation to its location and other planned developments in the area?	Refer to the cumulative impact assessment as part of the impact assessment: Part A(h)(v).

g) Motivation for the overall preferred site, activities and technology alternative

The preferred site was chosen due to its proximity to the town that the wastewater treatment works will provide water to. If a site is chosen further away, excessive transportation costs will be endured, and new land will be disturbed leading to further environmental damage. There are no technological alternatives considered. Refer to Part A(p)(i) below for a motivation of the activities that will take place. This placement is also on the portion 73 subdivision of Trichardtsfontein. If it moves it will fall on the remainder of portion 10 of Trichardtsfontien which is owned by SASOL.

The final decommissioning and rehabilitation has been discussed with the community. The activities in this BAR is the most effective way to rehabilitate the area.

h) Full description of the process followed to reach the proposed preferred alternatives within the site

i) Details of the development footprint alternatives considered

The following definition of "alternatives" is given in the EIA Regulations: *""alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the -*

(a) property on which or location where the activity is proposed to be undertaken;

(b) type of activity to be undertaken;

(c) design or layout of the activity;

(d) technology to be used in the activity; or

(e) operational aspects of the activity; and includes

(f) the option of not implementing the activity.

As seen above, there are no alternatives that are being are applied for in conditions (a) to (f). A comparison of impacts for the preferred and no-go option is included in Part A, Section vii.

ii) Details of the Public Participation Process Followed

According to the Publication of Participation Guideline (NEMA), and I&AP is:

"(a) any person, group or persons or organisations interested in or affected by an activity, and (b) any organ of state that may have jurisdiction over any aspect of the activity".

This definition is more detailed in the Guideline for consultation with communities and I&APs:

"Interested and affected' parties include, but are not limited to; (i) Host Communities, (ii) Landowners (Traditional and Title Deed owners), (iii) Traditional Authority, (iv) Land Claimants, (v) Lawful land occupier, (vi) The Department of Land Affairs, (vii) Any other person (including on adjacent and non-adjacent properties) whose socio-economic conditions may be directly affected by the proposed prospecting or mining operation (viii) The Local Municipality, (ix) The relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project."

The process followed adheres to the National Environmental Management Act 107-1998 - National guideline on minimum information (20180209-GGN-41432-00086) and the 2012, IEM Guideline Series 7, Public participation, GN 807.

(a) Formal announcement of the project

An advertisement was published in the local newspaper "Ridge Times" on 17th April 2019. Refer to Addendum 4A for a copy and proof of this advertisement. One site notice was placed onsite on 17th April 2019. Refer to Addendum 4B for a copy and proof of the site notices placed. Letters were sent to all stakeholders on 17th April 2019. Refer to Addendum 4C for this letter as well as proof of the letters sent. The final Basic Assessment Report will be sent to all Interested and Affected Parties.

Details of the application were included in the notices placed in the designated area mentioned above. The nature and the location of the activity, where further information can be obtained was added to the site notice. The applicant's intention to submit an application is clearly stated on the notice and comments in response to the site notices and advertisements are acknowledged. The competent authority will receive a copy of the newspaper advertisement which indicates the name of the newspaper and the date of publication. A picture of the site notice along with the coordinates of the site notice will also be sent to the competent authority and lastly copies of the written notices that were submitted by email or hand delivered will also be sent to the competent authority.

(b) Basic Assessment

The BAR is sent to all stakeholders and registered Interested and Affected Parties. Refer to Addendum 4D for proof of the BAR sent to all.

All I&APs are given the opportunity to comment on the final report if they are registered. This includes any issues that they have with the proposed activity and that they believe may be of significance in the consideration of the application. These comments need to be submitted within the specified timeframe.

The submission of the comments is received by the EAP. The organs of state have 40 days to comment (failing to do so will be taken as no comment) The DWS has 60 days in which to comment. If there are no comments within this time, then it will be regarded as no comments given to the CA.

Comments and responses are included in a separate report what is submitted with the BAR. Within 12 days of the date of decision taken by the department, all I&APs should be notified. They should also be notified that an appeal may be lodged.
All comments are included in Part A(h)(iii) below.

(c) Decision making announcement to stakeholders and I&APs

To be provided once received.

iii) Summary of issues raised by interested and affected parties and an indication of the manner in which the issues were incorporated, or the reasons for not including them

Refer below to a summary of all issues raised by the stakeholders and I&APs.

Table 7: Interested and affected parties identified

Interested and Affected Parties	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where issues and or response were incorporated
Affected parties				
Landowner/s				
Marnus Van Zyl	None	None	N/A	N/A
Lawful occupier/s of the land				
Ecencico (Pty)Ltd	None	None	N/A	N/A
Landowners or lawful occupiers on adjacent properties				
J A Kruger Familie Trust	None	None	N/A	N/A
Agata Eiendomme Cc	None	None	N/A	N/A
Sasol Mining Pty Ltd	Refer below			
Kathy Trust	None	None	N/A	N/A
Noord Vrystaat Graan & Vee Pty Ltd	None	None	N/A	N/A
Vosstoffel Pty Ltd	None	None	N/A	N/A
Ward councillor - Ward 25				
Ciska Botha	None	None	N/A	N/A
Gert Sibande District Municipality				
Fortunate	None	None	N/A	N/A
Govan Mbeki Municipality Local Municipality				
Cllr NE Nkosi	None	None	N/A	N/A
Organs of state				
DWS Mpumalanga	None	None	N/A	N/A
Communities				
Trichardt residential community	Refer below			
Mpumalanga Tourism and Parks Agency				
Lorraine	None	None	N/A	N/A
Department of Agriculture, Rural Development, Land and Environmental Affairs				
Sindisiwe Mbuyane	None	None	N/A	N/A
Department of Agriculture, Forestry and Fisheries				
Pamela Ntuli	None	None	N/A	N/A
Other Competent Authorities affected				
South African Heritage Resources Agency (SAHRA)	None	None	N/A	N/A
Other affected parties				

Interested and Affected Parties	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where issues and or response were incorporated
Historically disadvantaged communities				
None identified	None	None	N/A	N/A
Land claimants				
	None	None	N/A	N/A
Interested parties				
Sasol Mining Pty Ltd	17th April 2019	There was an issue raised regarding Sasol Pty Ltd being the landowner of Portion 10 of the farm Trichardsfontein 140 IS *"Hi Deshree* *Thank you for your email, please accept my apologies for only replying now.* *Title deed number T1805/2011 refers to three properties:* *1. Remainder of Portion 10 of Trichardtsfontein 140 IS – subsequently sold to Ecencico (Pty) Ltd under T7261/2012 (see bottom of page 5) (and thus no longer part of T1805/2011)* *2. Portion 73 of Trichardtsfontein*	It has been confirmed that the WWTW falls on portion 73 (a portion of portion 10) which is not owned by SASOL.	N/A

Interested and Affected Parties	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where issues and or response were incorporated
		140 IS (now Terra Nova x 4) *3. Portion 69 of Trichardtsfontein 140 IS (now Terra Nova)* *As per page 5, Portions 70 (now Terra Nova x 1) , 71 (now Terra Nova x 2) and 72 (now Terra Nova x 3) was subdivided from Portion 10 prior to the transfer of Portion 10 to Ecencico.* *We still believe that the proposed development is situated on Terra Nova x 4 – may I suggest that you plot the coords of the attached sg diagram onto your plan, to confirm the correct erf number in Terra Nova?* *Please do not hesitate to contact us should you require any additional information."*		

Interested and Affected Parties	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where issues and or response were incorporated
Marlene Van Der Linde	18th April 2019	Thanks for the quick reply and adding me on the list; I look forward to reading the reports - always interesting to learn more about the area around here. I was actually wondering about listed activity 25 of the BA - treatment of wastewater of more than 2000m3 per day. I suppose the plant is under the limit if you guys didn't add it on the list.	The plant does fall under these limits.	Part A(d)
Sean Fourie	23rd April 2019	Main concern is that we might experience a unpleasant smell, depending on wind direction smells can travel far and would not want to be at home experiencing the smell of the plant	According to the designer of the WWTW, this is not anticipated to be a problem.	
Makika Phiri	23rd April 2019	Permission can be granted as this will help with an effective and efficient waste management. Also request the use of professional and	Thank you for granting Terra Nova with permission to go ahead with the development.	N/A

Interested and Affected Parties	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where issues and or response were incorporated
		experienced personel.		
Lazarus	23rd April 2019	Registered as an I&AP	Registered as an &AP.	Part A(h)(v)
	20th June 2019	Telephonically requested addendums and word document of the BAR	Sent the addendums and responded to his request.	Part A(h)(v)
Matilda Nkoano	13th May 2019	I'm in support of this initiative, I just have one concern. The proposed area is too close to the complex so the smell will be unbearable and how will you monitor the gas release so as not to affect people in the adjacent area.	According to the designer of the WWTW, this is not anticipated to be a problem.	Part A(h)(v)

iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

The environmental attributes described below include socioeconomic, social, heritage, cultural, geographical, physical and biological aspects. Refer below for the following:

a. Type of environment affected by the proposed activity - its current geographical, physical, biological, socioeconomic, and cultural character;
b. Description of the current land uses;
c. Description of specific environmental features and infrastructure on the site; and
d. Environmental and current land use map - which shows all environmental, and current land use features.

1 Geology

The following information is extracted from the Spatial Development Framework (Govan Mbeki, 2014-2034).

The geology of Govan Mbeki is dominated by sedimentary rocks of the Vryheid Formation of the Ecca Group, Karoo Supergroup. These rocks primarily consist of sandstones, shales and coal beds and are extensively intruded by dolerites of Jurassic age. Quaternary alluvial deposits are present in topographical lower lying areas adjacent to the major surface water drainage bodies.

2 Climate

The following information is extracted from the Spatial Development Framework (Govan Mbeki, 2014-2034).

An extremely varied climate associated Highveld also experiences a summer rainfall during the months of October to February and has contrasting temperatures of 8 degrees to 26 degrees during this time. Winter temperatures average in the range of 19 degrees during the months of April to August. Characterised by dry conditions. Frost occurs

3 Topography

The following information is extracted from the Spatial Development Framework (Govan Mbeki, 2014-2034).

Govan Mbeki is fairly flat with altitudes varying from 1500 to 1820 m above sea level. Most of the area is situated between 1560 to 1640 m above sea level. The region is fairly flat with areas having no more of a slope of 9%. Elevation of the vicinity of the proposed wastewater treatment plant is 1599m on average. The maximum slope is 11.3%, -7,8% and the average slope is 6,3% and -2,8%.

4 Soil

Information from this section was extracted from the SANBI BGIS map viewer (accessed 14th May 2019).

The soils in the proposed region of study can be described as strongly structured cracking soils, mainly dark coloured, dominated by swelling clays (vertic soils). They may occur associated with one or more of melanic and red structured soils.

The soil class consists of an association of Classes 5, 6, 10, 11, 12: Undifferentiated clays. According to Fey (2010), vertic soils are problematic soil types from a management perspective (Fey, 2010). Their tendency to alternate from being either too dry and hard or excessively wet and sticky means that the ‘workable’ is very short or non-existent.

There are difficulties experienced agricultural management of such soils which has meant that many areas of vertic soils are used for grazing to produce sweet veld which allows all-year grazing potential.

5 Pre-construction land capability, land use and existing infrastructure

Referring to GoogleEarth images taken from 2003, there are no existing infrastructure on the site itself. Construction of the Terra Nova development commenced in approximately 2009 which is adjacent to the site.

There pre-construction land capability and land use is wilderness.

6 Vegetation and Animal life

The vegetation type of the study area has been characterised as the Soweto Highveld Grassland which is located within the Grassland biome. Soweto Highveld Grassland is classified as Endangered according to Mucina & Rutherford (2006) due to large scale transformation through mining, cultivation and urban sprawl. Furthermore, Soweto Highveld Grassland is also listed as a Vulnerable ecosystem in terms of Section 52 of the National Environmental Management: Biodiversity Act. The vegetation type code is 8.

The following information is extracted from Ferrar A.A. & Lötter, M.C.(2007) Mpumalanga Biodiversity Conservation Plan Handbook. Mpumalanga, Tourism & Parks Agency, Nelspruit.

The cool, dry open landscapes of the Highveld, mainly above 1000 m, with rainfall of over 500 mm/yr, is subjected to the common occurrence of frost, hailstorms and lightning strikes. The natural occurrence of fire and these other defoliating events favour grassland plants over woody species and help maintain the open treeless character of grasslands.

Fire is a characteristic feature of grassland and is a necessary component of good land management. Grassland plants depend on fire, they resprout annually from their root-stocks. Without frequent fire, grasslands eventually become invaded with woody species and some herbaceous plants die. Regular burning to complement good grazing management helps to prevent the increase of species unpalatable to livestock, including woody species that form bush encroachment.

Studies of grassland vegetation activity from satellite data indicate that grasslands are strongly seasonal with a late summer maximum in vegetation activity and near complete termination of activity during winter months.

8 Surface water

8.1 Surface water hydrology

Information for this section was extracted from SANBI (2003): Grassland Ecosystem Guidelines Landscape interpretation for planners and managers.

The wastewater treatment plant falls within the B11D quaternary catchment and within the Olifants water management area. The wetland class in the study region is NWCS L4 class which is categorised

as a Mesic Highveld Grassland Group 3 Seep. The water originating from the Trichardspruit which passes through the study area as seen in Figure 2 below drains into the Trichardtsfontein Dam.

General characteristics of this group of ecosystems are that they:

- Are made up of highly productive sourveld grasslands characterised by long-lived grasses that favour re sprouting, and other plants that show a tendency to store carbohydrates in specialised underground storage organs; plants withstand above-ground disturbance by being long-lived with only occasional replacement from seed.
- Are adapted to a climate characterised by high summer rainfall (700 – 1 200 mm mean annual precipitation), combined with warm summer temperatures and cool to cold winters with a moderate to high incidence of frost.
- Occur at mid-altitudes (1 300 – 1 800 m) in varied landscapes that include extensive flat or undulating plains broken by low hills and ‘tafelbergs, rocky outcrops, steep boulder-strewn slopes and deep river valleys.
- Occur on soils that are generally deep, fertile and free-draining but can have impervious layers of hardpan or ‘ouklip’ (impervious soil layers, often infused with minerals such as calcium carbonate or iron oxide). The diversity of soil types is influenced by the underlying geology which includes base layers of sedimentary rock (shales, mudstones and sandstones), cut through by dykes and ridges of dolerite, quartzite and gabbro.

The Aquatic Ecology Assessment of The Proposed Terra Nova Wastewater Treatment Works (Limnology, 2019) stated that:

The aquatic ecosystems of the study site are in average condition (Wetland IHI PES= C) with the EIS of the system calculated to High. The water quality of the system for chemical aspects are within range but the microbiological aspects showing clear signs of faecal coliform pollution in the system. The faecal coliform pollution source is not clear. It is suspected to originate from the town of Trichardt close to the study site. this indicates municipal services degrading in the town leading to sewage pollution in the river system. Currently all the sewage from the Terra Nova development is pumped to the municipal WWTW on the opposite bank of the river. The WWTW is kept operational by the developers of Terra Nova to ensure the system remains functional.

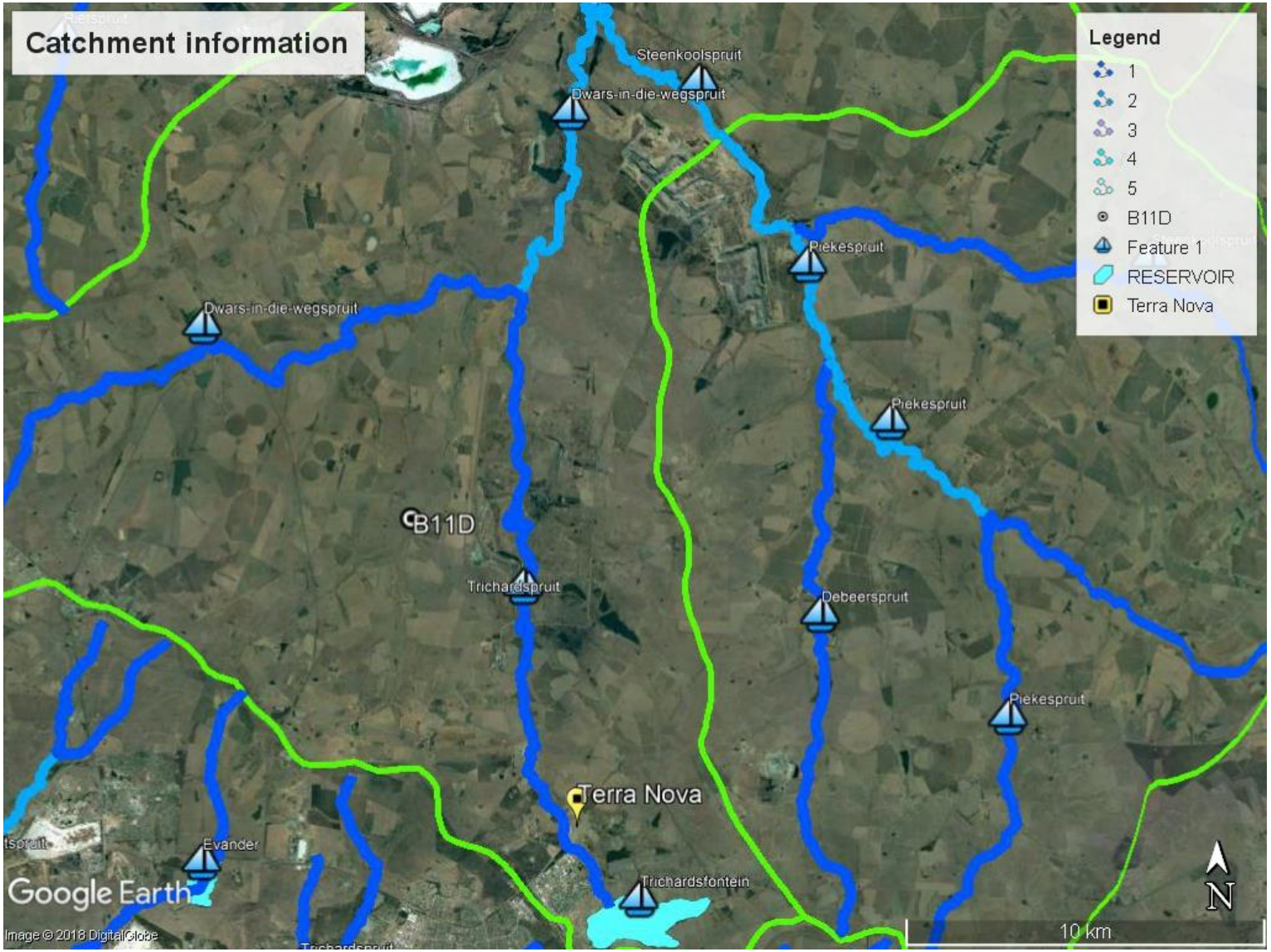
Catchment information
Legend
1
2
3
4
5
B11D
Feature 1
RESERVOIR
Terra Nova
Steenkoolspruit
Dwars-in-die-wegspruit
Piekespruit
Dwars-in-die-wegspruit
Piekespruit
B11D
Trichardspruit
Debeerspruit
Piekespruit
Terra Nova
Evander
Trichardsfontein
Google Earth
Image © 2018 DigitalGlobe
N
10 km

Figure 2: B11D catchment information

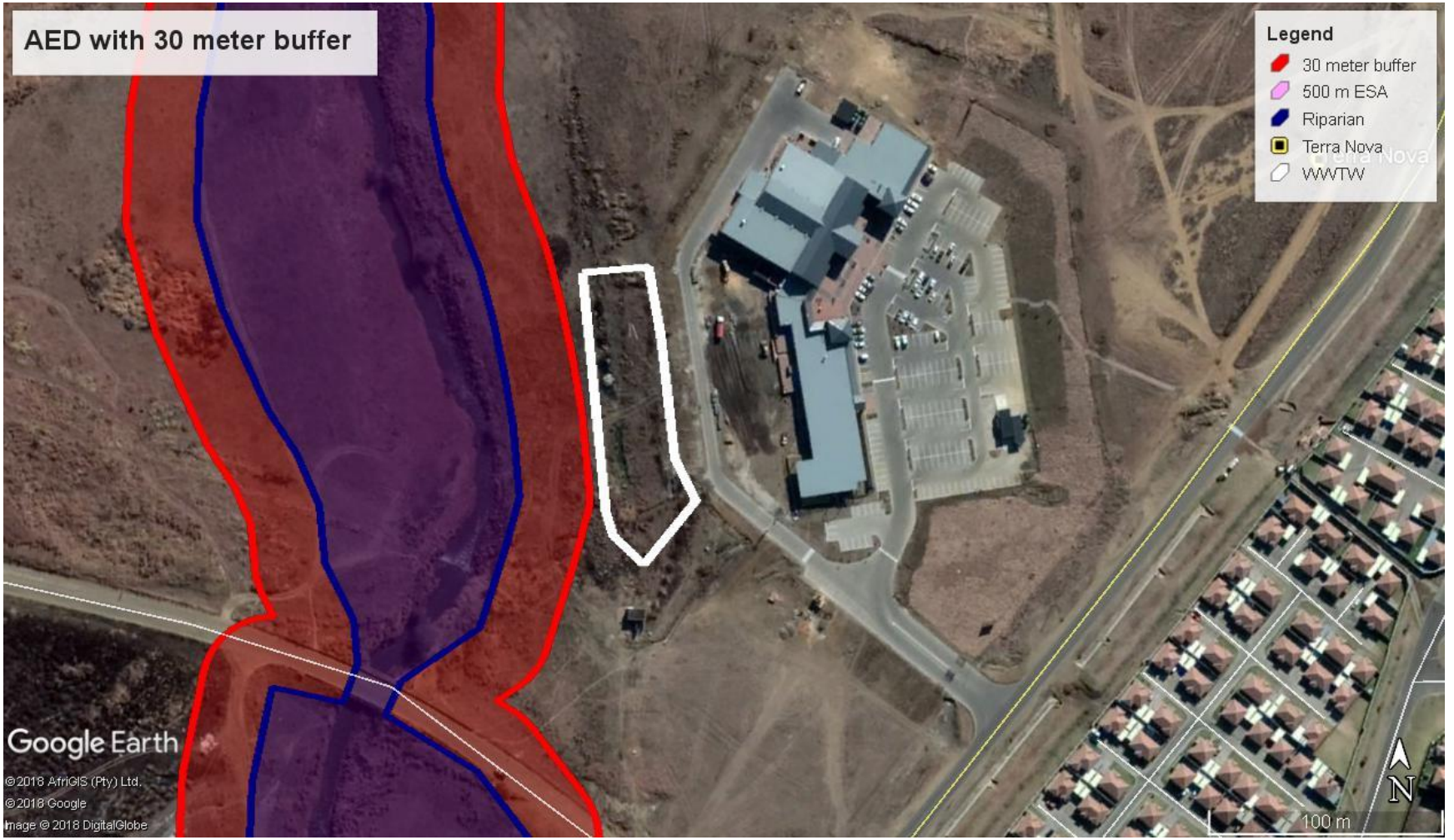

Figure 3: Aquatic ecosystem delineation

9 Groundwater

9.1 Groundwater use

The following information is extracted from the Spatial Development Framework (Govan Mbeki, 2014-2034).

Groundwater is being used by farming communities as the primary source of water as well as for garden watering on some stands. The majority of these boreholes are not registered.

10 Cultural and heritage resources

No study was done due to the size of the development.

11 Sensitive features

Refer to section 8 (Figure 3) for the riparian boundary. The WWTW falls outside this boundary but within 32m of the boundary.

12 Regional socio-economic aspects

The following information was extracted from the Integrated Developmental Plan (Govan Mbeki, 2018-2019)

The latest Community Survey 2016 as issued by STATSSA, indicated Govan Mbeki has the 1st largest population in the Gert Sibande District with a population size of 340091 in 2016 compared to 294538 in 2011. The population grew on average by 3.1 % between 2011 and 2016 as compared to the district wide growth of 1.88 %.This could be the result of people migrating to the municipality seeking job opportunities as Govan Mbeki is considered to be one of the economical hubs of Mpumalanga for job seekers.

Govan Mbeki is the most prominently 2nd fastest growing population with an annual population growth rate of 3.10% in the whole of the Mpumalanga Province after Steve Tshwete with a population growth of 4.29%.
A population growth of this proportion is likely to place strain on existing backlogs and the municipality's ability to effectively service the community. Because of the increase in households which directly demand services.

The analysis of the age and gender distribution of Govan Mbeki Municipality will particularly highlight growth trends, the gender ratio, and functional age categorisation and how the age distribution impacts dependency on the working population. These statistics provide important insights into the age groups, where the bulk of the population is located and to target government, civil society and non-governmental programmes more effectively.

To ensure basic service delivery to all, municipal budget allocations should be informed by credible and accurate assumption regarding the number of households within a municipal area. According to Census 2011 and the recent 2016 Community Survey done by Stats SA.

The number of households for the Govan Mbeki Municipal Area increased from 83874 in 2011 to 108894 in 2016. The statistical data offers insight into the fact that Govan Mbeki has experienced the highest population and household growth annually.

An annual growth increase of 5.80% in the total number of households within the municipal area and rank Govan Mbeki as the fastest growing population in Gert Sibande district with an Average Household size of 3.12%.

1. Housing demand, and availability

The settlement of people within Govan Mbeki needs to be distributed to and structured within the definite development nodes, provide for a residential mix satisfying the needs of all income groups.

The future demand for housing is based on the following:

- Base Population: 2011:294,539 (StatSA)
- Average household size: 3.5
- Growth 2011-2018: 3% p.a.
- Growth 2018-2033: 2% p.a.

The provision of housing in for the 5-year periods spanning over the next 20 years is based on:

- A base population:294,539 in 2011 (StatSA)
- An average household size: 3.5
- A growth of 3% p.a. for the period 2011-2019
- A growth of 2% p.a. for the period 2019-2034

2. Social infrastructure - schools, hospitals, sporting and recreating facilities, shops, police, civil administration

- Social infrastructure/facilities includes education, health and emergency services, social and cultural facilities, social services, civil services, and recreational infrastructure
- Eliminate inequalities among and within communities
- Improve the quality of life especially of poor communities, provide for law and order, and enhance the stability of a community
- Promote equitable access to social services for all communities and contribute to the development of integrated and sustainable human settlements through the application of norms and standards for social infrastructure requirements.
- Ensure that sufficient land is reserved for these essential facilities.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts, can be reversed, may cause irreplaceable loss of resources; and can be avoided, managed or mitigated;

The following environmental components are not assessed as part of this study as they will not be affected by the development; geology, topography and visual aspects, air quality, and environmental noise. It must be further noted that there are no significant levels of topsoil or vegetation found on site. The development is taking place in a region that has a current land use zone classed as residential. Therefore, the general area has already been disturbed prior to the commencement of the development.

The only alternative will be the no-go alternative. Refer to Part A section h(vii) for a comparison between the impacts of the preferred alternative and the no-go option.

1. Soils, land capability, surrounding land use and landscape character

Activities:

A. Removal of all vegetation and topsoil for the development of the hydroponics system, fishponds and treatment package plant.
B. All activities which use hazardous substances including driving of vehicles and machinery and the potential spillage of chemicals used in the treatment plant.
C. Waste generation.

Aspect and impact description:

(1) Loss of topsoil and land capability.
(2) Soil erosion due to removal of vegetation.
(3) Soil pollution from spillages of hazardous chemical substances and incorrect disposal of waste

CONSEQUENCE		
Nature / Intensity / Severity of Impact	**Before management**	**With management**
(1) No loss of topsoil and land capability anticipated.	0	0
(2) Soil erosion will lead to low severity.	1	0

(3) Soil pollution of minor spillages will be low.	2	0
Spatial extent of Impact	**Before management**	**With management**
(1) No loss of topsoil and land capability anticipated.	0	0
(2) Soil erosion will be contained on site.	1	1
(3) Soil pollution will be contained on site, and with management to the activity itself.	1	1
Duration of Impact	**Before management**	**With management**
(1) No loss of topsoil and land capability anticipated.	0	0
(2) Soil erosion will be permanent if not rehabilitated.	4	3
(3) Soil pollution will be long-term if not removed.	3	1
LIKELIHOOD		
Probability of potential occurrence of the Impact	**Before management**	**With management**
(1) No loss of topsoil and land capability anticipated.	0	0
(2) Soil erosion is probable.	1	0
(3) Soil pollution is probable.	1	0
Frequency of potential occurrence of the Impact	**Before management**	**With management**
(1) No loss of topsoil and land capability anticipated.	0	0
(2) Soil erosion could take place regularly.	2	1
(3) Soil pollution could take place regularly.	2	1
SIGNIFICANCE	**Before management**	**With management**
(1) The risk of loss of topsoil and land capability will not be applicable.		
(2) Soil erosion will be low before and after management.	10	6
(3) Soil pollution will be low before and after management.	10	3
Cumulative impacts All other activities in the area could also lead to loss of topsoil, erosion as well as soil pollution as the residential area is close to the development.		
Environmental objective To reduce the loss of topsoil and land capability. To prevent soil erosion.		

To prevent soil pollution.						
Management measures to be applied	**Phase applicable to management measure**	**Management tools**	**Monitoring programmes**	**Management timeframe and schedule**	**Responsibilities for implementation and long-term maintenance**	**Mitigation hierarchy**
Topsoil to be sourced and brought into the developmental area to be used for stabilisation.	Closure phase	Rehabilitation Plan	Site inspection	As per rehabilitation plan.	Project manager.	Rehabilitate.
Erosion measures should be put in place such as the continuous tillage of soil or the planting of vegetation around the development.	Operation phase.	Rehabilitation plan.	Ste inspection.	Continuously through closure.	Project manager and site surveyor.	Rehabilitate.
All vehicles and machinery must be maintained to prevent soil pollution.	Operation and decommissioning phase	Maintenance register	Checking of maintenance schedule	As per schedule of maintenance register	Project manager.	Prevent.
Waste to be removed to licenced facilities and a safety disposal certificate to be provided to the site.	Operation and decommissioning phase	Waste documents	Site inspection	Continuous	Project manager.	Prevent
No illegal dumping of any waste may take place.	Operation and decommissioning phase		Site inspection	Continuous	Project manager.	Prevent
All polluted soil will be removed as hazardous waste.	Operation and decommissioning phase	Waste documents	Site inspection	Continuous	Project manager.	Minimise
Stakeholder expectations and / or comments None received.						
Long-term environmental legacy and managed burden left With adequate management, there will be no long-term environmental legacy or managed burden left.						

2. Surface water and ground water

Activities:

(1) All activities which use hazardous substances including driving of vehicles and machinery. Refer to Part A, section v(1) for management measures.
(2) Wastewater treatment activities.
(3) The production of sludge during operation.
(4) Construction and operation of Wastewater Treatment works

Aspect and impact description:

(1) Alteration of drainage patterns due to development and other infrastructure; which also leads to loss of surface water in the wetland area.
(2) Increased urban or stormwater run-off caused by an increase in hardened surfaces
(3) Attraction of flies and mosquitoes.
(4) Overspill of sludge can pollute surrounding environment.

CONSEQUENCE		
Nature / Intensity / Severity of Impact	**Before management**	**With management**
(1) Alteration of drainage patterns and loss of surface water could alter environmental functions.	2	1
(2) Pollution of surface water could alter environmental functions.	2	1
(3) Attraction of flies and mosquitoes to the site.	2	1
(4) Pollution of surface water due to sludge could result in heavy metals in the water.	2	1
Spatial extent of Impact	**Before management**	**With management**
(1) Alteration of drainage patterns and loss of surface water will be localised.	3	3
(2) Pollution of surface water will be localised.	3	1
(3) Attraction of flies and mosquitoes will be localised.	3	1
(4) Sludge overflows will be localised	3	1
Duration of Impact	**Before management**	**With management**
(1) Alteration of drainage patterns and loss of surface water will be permanent without rehabilitation.	4	3
(2) Pollution of surface water will be long-term without management.	3	1
(3) Vectors may be present in the long-term without management.	3	1
(4) Sludge overflows will be short-term with management.	2	1
LIKELIHOOD		

Probability of potential occurrence of the Impact	**Before management**	**With management**
(1) Alteration of drainage patterns and loss of surface water is definite.	3	2
(2) Pollution of surface water is probable.	2	1
(3) Vectors attracted to the wastewater treatment plant is definite.	3	1
(4) Sludge overflows are probable.	2	1
Frequency of potential occurrence of the Impact	**Before management**	**With management**
(1) Alteration of drainage patterns and loss of surface water is regularly.	2	1
(2) Pollution of surface water will be regularly.	2	1
(3) The presence of vectors around the site will be regular.	2	1
(4) Currently there are no sludge overflows as the development has not yet occurred.	0	0
SIGNIFICANCE	**Before management**	**With management**
(1) Alteration of drainage patterns and loss of surface water will be medium before and low after management.	14	10
(2) Pollution of surface water will be medium before and low after management.	12	5
(3) Attraction of vectors to the site will be medium before and low after management.	13	5
(4) Sludge overflows will be low before and after management.	9	4
Cumulative impact There are various activities in the area that can also impact on the water resources in the area.		
Environmental objective To minimise any alterations in drainage patterns. To prevent the contamination and sedimentation of surface water resources. To minimize the attraction of vectors to the site. To avoid sludge overflows.		

Management measures to be applied	**Phase applicable to management measure**	**Management tools**	**Monitoring programmes**	**Management timeframe and schedule**	**Responsibilities for implementation and long-term maintenance**	**Mitigation hierarchy**
There will be a berm for stormwater overflows. These berms must be above the 1:100-year flood line.	Operation and decommissioning phase	Stormwater design	Site inspections.	Continuous	Project manager.	Minimise.

The design capacity compensates for no overflows.	Operational phase.	Engineer designs.	Site inspections.	Site inspections.	Site engineer.	Prevent.
Telematics will be used to indicate overflows.	Operational phase.	Telematics devices.	Site readings and inspections.	Site inspections.	Project manager and personnel.	Prevent.
Screenings from the WWTW must be disposed of responsibly and within the guidelines of legislation	Operational phase.	Standards and applicable legislation.	Site inspections.	Site inspections.	Project manager and personnel.	Prevent.
Access roads and access manholes must be outside the 1: 100-year flood line.	Operational phase.	Aquatic delineation report.	Monitoring programme.	Continuous.	Project manager and wetland specialist.	Prevent.
Stakeholder expectations and / or comments None received.						
Long-term environmental legacy and managed burden left With adequate management, there will be no long-term environmental legacy or managed burden left.						

3. Archaeological, historical and cultural aspects

Activity:

(1) Various activities on site.

Aspect and impact description:

(1) Destruction of any archaeological, historical and cultural unearthed. There are no known sites of archaeological and cultural interest in any of the construction areas.

CONSEQUENCE		
Nature / Intensity / Severity of Impact	**Before management**	**With management**
(1) Destruction of any archaeological, historical and cultural unearthed will alter the environmental functions.	2	0
Spatial extent of Impact	**Before management**	**With management**
(1) Destruction of any archaeological, historical and cultural unearthed will be at the activity.	1	1
Duration of Impact	**Before management**	**With management**

(1) Destruction of any archaeological, historical and cultural unearthed will be permanent.	4	4
LIKELIHOOD		
Probability of potential occurrence of the Impact	**Before management**	**With management**
(1) Destruction of any archaeological, historical and cultural unearthed is unlikely.	0	0
Frequency of potential occurrence of the Impact	**Before management**	**With management**
(1) Destruction of any archaeological, historical and cultural unearthed has not yet happened.	0	0
SIGNIFICANCE	**Before management**	**With management**
(1) Destruction of any archaeological, historical and cultural unearthed will be low before and after management.	7	5
Cumulative impacts None currently.		
Environmental objective Ensure that if any archaeological, historical and cultural resource is unearthed, it would be correctly managed.		

Management measures to be applied	Phase applicable to management measure	Management tools	Monitoring programmes	Management timeframe and schedule	Responsibilities for implementation and long-term maintenance	Mitigation hierarchy
Archaeological deposits can occur below ground level. Should any archaeological artefacts or skeletal material be revealed in the area during construction activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (cf. HRA). Prior to the commencement of any work or action that will impact or effect a heritage resource, the relevant authorisation must be obtained from the SAHRA. Where there is uncertainty with regard to the status of a heritage resource, object, place or artefact, or any legislative or other policy issue	Operational	Basic awareness	Site inspections	Inspections during construction.	Project manager	Prevent

the SAHRA can be contacted for clarity: SAHRA, P.O. Box 2771, CAPE TOWN, 8000, Tel: (021) 465 2198, Fax: (021) 465 5789, Email: info@sahra.org.za						
Stakeholder expectations and / or comments None received.						
Long-term environmental legacy and managed burden left With adequate management, there will be no long-term environmental legacy or managed burden left.						

4. Socio-economic

Activity:

(1) Odour emitted through the transport of sewage to the Works

(2) Increased traffic to site due to road tankers

Aspect and impact description:

(1) Safety of community due to traffic from the development.

(2) Odour can disrupt people living nearby.

Method for assessing risks:

Impact assessment and management has been added where necessary.

CONSEQUENCE		
Nature / Intensity / Severity of Impact	**Before management**	**With management**
(1) Safety of community due to traffic from the development could lead to fatalities, if not managed.	3	0
(2) No such odour anticipated.	0	0
Spatial extent of Impact	**Before management**	**With management**
(1) Safety of community due to traffic from the development will be localised.	3	3
(2) No such odour anticipated.	0	0
Duration of Impact	**Before management**	**With management**
(1) Safety of community due to traffic from the development will be long term.	3	2

(2) No such odour anticipated.	0	0
LIKELIHOOD		
Probability of potential occurrence of the Impact	**Before management**	**With management**
(1) Safety of community due to traffic from the development is probable.	1	0
(2) No such odour anticipated.	0	0
Frequency of potential occurrence of the Impact	**Before management**	**With management**
(1) Safety of community due to traffic from the development has not yet happened.	0	0
(2) No such odour anticipated.	0	0
SIGNIFICANCE	**Before management**	**With management**
(1) Safety of community due to traffic from the development will be medium before and low after management.	11	7
(2) The risk odour will be not applicable. .		
Cumulative impacts All roads in the area contribute to traffic. All other activities including the N4 increase safety risk of the community.		
Environmental objective To ensure the safety of the community on the site and reduce the possible odours.		

Management measures to be applied	**Phase applicable to management measure**	**Management tools**	**Monitoring programmes**	**Management timeframe and schedule**	**Responsibilities for implementation and long-term maintenance**	**Mitigation hierarchy**
All vehicles will drive within the speed limits of the development and adhere to national road regulations.	Operational	Signage.	Site inspections.	Continuous.	All personnel.	Prevent.
Improve ventilation; If septic conditions develop, chemical dosing will assist in reducing the concentration of odorous emissions;	Operational	Chemical dosing.	Site inspections.	Continuous.	Site manager.	Minimise.

Minimize intermediate storage; Regular cleaning to remove accumulations;	Operational until closure.	Maintenance register.	Site inspections.	Continuous.	Cleaning personnel.	Minimise.
Stakeholder expectations and / or comments Concerns were raised regarding the proximity of the wastewater treatment works to the residential area. Due to the proximity, residents are concerned that there might be an unpleasant odour emitted from the works.						
Long-term environmental legacy and managed burden left With adequate management, there will be no long-term environmental legacy or managed burden left.						

vi) The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives

Impact Assessment:

The methodology used to assess the significance of an impact is based on the requirements as set out in EIA Regulations, (GN 982) of 2014. The impact significance methodology described below also complies to Appendix B of the Operational Guideline to Integrated Water and Waste Management of 2010 in terms of the NWA. In the event of any Section 21c&i water uses in terms of the NWA being assessed, Appendix A of the General Authorisations of 2016, GN 509 in terms of the NWA will be used to construct a risk matrix. Regulation 3(b) of the General Authorisations of 2016, GN 509 in terms of the NWA states that a suitably qualified SACNASP professional member must determine risks associated with this risk matrix.

Impact identification and prediction means forecasting the change of environmental parameters due to developmental patterns. These parameters may also be changing due to climate change and should be included.

Method of assessment: Impact identification and prediction is a stepwise procedure to identify the direct, indirect and cumulative impacts (relating to both positive and negative impacts) for which a proposed activity and its alternatives will have on the environment as well as the community. This should be undertaken by determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity aspects of sites and locations as well as the risk of impact of the proposed activity. Refer to part A(h)(iv) for a complete description of these environmental attributes. Sources of data to be used for gathering data on the environmental attributes as well as the impacts include; monitoring / sampling data collected and stored, assumptions and actual measurements, published data available from the departments or other stakeholders in the area as well as specialist studies. Likely impacts should be described qualitatively and then studied separately in detail. This provides consistent and systematic basis for the comparison and application of judgements.

Significance rating: Ratings should then be assigned to each criterion. Significance of impacts should be determined for each phase of the developmental lifecycle this includes; preconstruction, construction, operational, closure (including decommissioning) and post closure phases. The significance of impacts should further be assessed both with and without mitigation action. The description of significance is largely judgemental, subjective and variable. However, generic criteria can be used systematically to identify, predict, evaluate and determine the significance of impacts resulting from project construction, operation and decommissioning. The process of determining impact magnitude and significance should never become mechanistic. Impact magnitude is determined by empirical prediction, while impact significance should ideally involve a process of determining the acceptability of a predicted impact to society. Making the process of determining the significance of impacts more explicit, open to comment and public input would be an improvement of environmental

assessment practice. Impact magnitude and significance should as far as possible be determined by reference to either legal requirements (accepted scientific standards) or social acceptability. If no legislation or scientific standards are available, the EAP can evaluate impact magnitude based on clearly described criteria. A matrix selection process is the most common methodology used in determining and ranking the site sensitivities:

- The consequence: includes the nature / intensity / severity of the impact, spatial extent of the impact, and duration of the impact.
    - The nature / intensity / severity of the impact: An evaluation of the effect of the impact related to the proposed development on the receiving environment. The impact can be either positive or negative. A description should be provided as to whether the intensity of the impact is high, medium or low or has no impact in terms of its potential for causing negative or positive effects. Cognisance should be given to climate change which may intensify impacts.
    - The spatial extent of the impact: Indication of the zone of influence of the impact: A description should be provided as to whether impacts are either limited in extent or affect a wide area or group of people. Cumulative impacts must also be considered as the extent of the impact as may increase over time.
    - The duration of the impact: It should be determined whether the duration of an impact will be short-term, medium term, long term or permanent. Cumulative impacts must also be considered as the duration of the impact as it may increase over time.
- The likelihood: includes the probability of the potential occurrence of the impact, and frequency of the potential occurrence of the impact
    - The probability of the impact: The probability is the quality or condition of being probable or likely. The probability must include the degree to which these impacts can be reversed; may cause irreplaceable loss of resources; and can be avoided, managed or mitigated
    - The frequency of the potential occurrence of the impact.
- The significance: This is worst case scenario without any management measures. See below how significance is determined: Impact that may have a notable effect on one or more aspects of the environment or may result in noncompliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence. Mitigation measures should be provided with evidence or motivation of its effectiveness

Example of significance rating:

			Before management	**With management**
CONSEQ	**Nature / Intensity / Severity of Impact**			
	Negligent	The impact is listed but it is deemed negligent.	0	0

	Low	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are not affected.	1	1
	Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are altered	2	2
	High	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	3	3
	Spatial extent of Impact			
	Activity	Impact occurs only at activity	1	1
	Site	Impact occurs on the site	2	2
	Local	Impact occurs outside of site but within boundaries.	3	3
	Regional	Impact occurs outside of local boundaries.	4	4
	Duration of Impact			
	Short-term	Through dilution and dispersion, the impact reduces to insignificant within 1 week.	1	1
	Medium-term	Through dilution and dispersion, the impact reduces to insignificant within the life of the development.	2	2
	Long-term	The impact will cease after the operational life of the mine either because of natural process or by human intervention	3	3
	Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.	4	4
LIKELIHOOD	**Probability of potential occurrence of the Impact**			
	Improbable	The possibility of the impact materializing is very low either because of design or historic experience	0	0
	Probable	There is a distinct possibility that the impact will occur	1	1
	Highly probable	It is most likely that the impact will occur	2	2
	Definite	The impact will occur regardless of any prevention measures	3	3
	Frequency of potential occurrence of the Impact			
	Currently not occurring	Currently this impact is not occurring.	0	0
	Once-off	Impact occurs only once-off	1	1
	Regularly	Impact occurs regularly.	2	2
	Continuously	Impact occurs continuously	3	3

CONSEQUENCE											
LIKELIHOOD		2	3	4	5	6	7	8	9	10	11
	0	2	3	4	5	6	7	8	9	10	11

	1	3	4	5	6	7	8	9	10	11	12
	2	4	5	6	7	8	9	10	11	12	13
	3	5	6	7	8	9	10	11	12	13	14
	4	6	7	8	9	10	11	12	13	14	15
	5	7	8	9	10	11	12	13	14	15	16
	6	8	9	10	11	12	13	14	15	16	17

Low	Where it will not have a significant influence on the environment. Management measures can be proposed to ensure that significance does not increase	3- 10
Medium	Where it could have a significant influence on the environment unless it is mitigated or managed	11- 15
High	Where it would have a significant influence on the environment regardless of any possible mitigation and hence must be either avoided or managed	16- 17
Medium positive	In the case of an impact having a positive outcome.	High positive

Mitigation and management

Management methodology is based on the requirements as set out in EIA Regulations, (GN 982) of 2014 i.t.o. the NEMA.

Management statements detail the processes, procedures and practices required to achieve an impact management outcome. A hierarchy of management tools used can also be used as seen below.

Mitigation should include measures in the following order of priority. The aim is to prevent adverse impacts from happening or, where this is unavoidable, to limit their significance to an acceptable level.

Avoiding or preventing impacts

If the biodiversity (an ecosystem, habitat for threatened species, ecological corridor or area that provides essential ecosystem services) is of conservation value or importance, it is best to plan to avoid or prevent impacts altogether by changing the location, siting, method or processes of the activities and related infrastructure.

Minimising impacts

Minimising impacts of the wastewater treatment works is a mitigation measure that deals with the environment in general. In areas where the biodiversity is to be affected is of conservational value or importance, then every effort should be made to minimise those impacts that cannot be avoided or prevented. Terra Nova Utilities (Pty) Ltd companies should strive to minimise impacts on biodiversity to ensure environmental protection. Section 2 of NEMA contains environmental management principles that resonates with minimising the impact rather than stopping at mitigation, this is imperative in for the development.

Rehabilitating impacted areas

Rehabilitation is the measures that are undertaken to "as far as it is reasonably practicable, rehabilitate the environment affected by the development to its natural or predetermined state or to a land use which aligns to the generally accepted principle of sustainable development. A closure plan is an essential part of rehabilitation and must be developed based on the establishment of the closure objectives and criteria.

Biodiversity offsets

Biodiversity offsets are measurable conservation gains that help to balance any significant biodiversity losses that remain after actions to avoid, minimise and restore negative impacts have been taken. They are the last stage of mitigation and should be considered after appropriate avoidance, minimisation, and rehabilitation/restoration measures have been applied already.

When dealing with management, impact management outcomes must:

- be set for the expected activity-based impacts;
- describe the desired outcome of the management measure/s prescribed or the standard to be achieved (environmental objective);
- be clearly documented and identified per project phase as in the impact identification and significance rating process (this must be aligned to the developmental closure objectives, and must therefore include predicted long-term result of the applied management measures);
- be measurable to determine compliance, which includes time frames and schedule for the implementation of the management measures; responsibilities for implementation and long-term maintenance of the management measures; financial provision for long-term maintenance; and monitoring programmes to be implemented;
- be informed by stakeholder expectations; and
- ensure legal compliance;

Finally, the impact assessment must refer to the residual and latent impact after successful implementation of the management measures.

vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

Refer to Part A, Section v for all impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources; and can be avoided, managed or mitigated.

The only alternative considered is the no-go option for which the impact is assessed in Part A(l)(iii) below

viii) The possible mitigation measures that could be applied and level of residual risk

Refer to Part A(h)(v) above for possible mitigation measures that could be applied and the level of risk.

ix) The outcome of the site selection matrix

Site selection was based on the included environmental components and site considerations as seen in Part A(h)(iv). Therefore, the development will take place on the site currently chosen.

x) Statement motivating the alternative development located within the overall site

The development will be discussed with the community. The activities in this BAR is the most effective way to rehabilitate the area.

x) Concluding statement indicating the preferred alternatives, including preferred location of the activity

This is the first BAR compiled for the development therefore no alternatives were considered.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity

Refer to Part A(h)(v) above for a full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

j) Assessment of each identified potentially significant impact and risk

This section includes all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Refer to Part A(h)(v) for a complete impact assessment.

k) Summary of specialist reports

A riparian area was observed on site. The system is in average condition (PES using WetHealth= C). The EIS of the system is also Very high (3.2). The impact assessment calculations determined the impact score to **12 (High): "The project can be authorised but with strict conditions and high levels of compliance and enforcement in respect of the impact in question".**

The proposed activities on site include the construction and operation of a Wastewater Treatment works (WWTW). The WWTW will be constructed on a bermed area to reduce risk of pills into the natural aquatic ecosystem. Water samples for the planning of the treatment plant indicated the river to be

currently polluted by coliforms. This can be attributed to a failure of the municipal infrastructure thus leading to sewage entering the river system. The planned sewage works will link to an existing sewage pump house and reduce the flows into the municipal WWTW that is overworked and ill equipped. this is expected to reduce current coliform pollution into the river and reduce the risks associated with the municipal WWTW.

All environmental assessments (including biodiversity assessments) must always be based on the three main aspects of the National Environmental Management Act, 1998 (Act No. 107 of 1998). These main aspects are the social, the economic, and the environmental aspects of the proposed development. It is also of concern that these aspects must be in balance and that if one outweighs another, good reasoning be sought to ensure the balance is restored. A buffer of 30 meters must be applied to the aquatic ecosystem found on the study site (see section 1.1 and Figure 33) of the wetland assessment). It must be clearly noted that any development on the study site will have an impact on the aquatic ecosystems and must be authorised in terms of Section 21 of the National Water Act (1998). A summary of findings is given in Table 8 below.

Table 8: Summary of findings

Aquatic ecosystem classification	Riparian
Present Ecological Score (PES)	C
Recommended Ecological Management Class (EIS/REMS)	Very High
Ecological risk assessment	High
Buffers	30 meters- development footprint must be outside 1:100 year floodline
Notice 509 GA or WUL score	Excluded due to activities planned
Sensitivity of aquatic ecosystems	High (red) (**Figure 33**)
Does the specialist support the development?	Yes- the new WWTW will reduce the impact of the municipal WWTW not operating currently at 100%.
Recommendations	• Aquatic ecosystem rehabilitation plan must be compiled, • Aquatic ecosystem monitoring plan must be compiled, • Automated monitoring of levels with telemetry must be installed to warn operators of possible risks

l) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment

Environmental component	Description of impact
Soils, land capability, surrounding land use and landscape character	Removal of topsoil and vegetation. Hazardous substances spillage and waste generation.
Vegetation and animal life	Removal of topsoil and all other activities on site.
Surface and ground water	Hazardous substances spillage.
	Wastewater treatment activities.

Environmental component	Description of impact
	Sludge production.
	Construction and operation of the Wastewater Treatment works.
Archaeological, historical and cultural aspects	Activities on site causing disturbance.
Socio-economic	Safety of community due to traffic from development.
	Odour can disrupt people living nearby.
Air quality	None envisaged.
Geology	
Noise, vibration, and shock	
Visual impact	
Topography	

(ii) Final Site Map

Refer to Addendum 1 for all the maps.

(iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives

Environmental Component	Preferred alternative	No-go option
Soils, land capability, land use and landscape character	The preferred alternative would result in minimal disturbance in the soil and landscape character as the soil has a low agricultural potential.	The no go option would result in the preservation of topsoil and land capability as well as the prevention of soil erosion and soil pollution. However due to extensive research it was determined that the soil has a low agricultural potential.
Vegetation and animal life	During a site visit, it was observed that there were no animals on site and vegetation growth is at a minimal. The construction of the wastewater treatment facility will result in the disturbance to existing vegetation.	The no go option will ensure that the vegetation on site will remain in place and the ecosystem functioning will not be disturbed.
Surface water and ground water	The drainage pattern within the area may be affected with the proposed development due to the proximity to the water course. However, a buffer has been created along the water source and a wetland assessment was undertaken. The development will	In terms of drainage patterns in the area, the no go option would result in the continuity of normal drainage patterns.

Environmental Component	Preferred alternative	No-go option
	take place in consideration of the buffer.	
	There will be additional storm water run-off due to the hardened surfaces from construction of the wastewater treatment facility. However, there are storm water management measures in place to mitigate this.	The no go option would ensure that there is no increased storm water run-off caused by the increase in hard surfaces.
	Water samples for the planning of the treatment plant indicated the river to be currently polluted by coliforms. This can be attributed to a failure of the municipal infrastructure thus leading to sewage entering the river system. The preferred alternative will link to an existing sewage pump house and reduce the flows into the municipal WWTW that is overworked and ill equipped. this is expected to reduce current coliform pollution into the river and reduce the risks associated with the municipal WWTW.	The no-go option would result in the continuous pollution of the river system.
Archaeological, historical and cultural aspects	The preferred alternative may result in the disturbance of Archaeological, historical and cultural aspects. However, if any are found, construction will stop, and a specialist will be consulted.	The no go option would ensure that there will be no damage to any archaeological, historical and cultural sites.
Socioeconomic	The development may cause disturbance to the surrounding community in the form of odour and an increase in traffic. However, as per Part A(v) above, there are mitigation measures in place for this.	Due to the increased traffic associated with the development and odour, the surrounding community may be disturbed with this alternative. However, water will be provided to the community for usage due to the wastewater treatment plant.

m) Proposed impact management objectives and the impact management outcomes for inclusion in the environmental management programme

Refer to Part A(h)(v) for all Proposed impact management objectives and the impact management outcomes.

n) Aspects for inclusion as conditions of Authorisation

The commitments addressed in the environmental authorisation will only be included once an EA is granted. Compliance to the EA will be ensured along with waste management, environmental emergencies, environmental awareness and handling of any hazardous substances. A WULA has also been made and the conditions of the WUL will be adhered to upon granting of the WUL.

o) Description of any assumptions, uncertainties, and gaps in knowledge

This BAR is compiled using already existing information. Aquatic ecosystem delineation report will be completed.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorised or not

Water scarcity is a recurring problem in South Africa as Sub-Saharan Africa is an arid part of the world (Bhagwan *et al.*, 2014). Due to this, the country faces many challenges regarding the provision of water. The proposed wastewater treatment plant will not only enhance sanitation but will also aid in water distribution for the town.

Water samples for the planning of the treatment plant indicated the river to be currently polluted by coliforms. This can be attributed to a failure of the municipal infrastructure thus leading to sewage entering the river system. The preferred alternative will link to an existing sewage pump house and reduce the flows into the municipal WWTW that is overworked and ill equipped. this is expected to reduce current coliform pollution into the river and reduce the risks associated with the municipal WWTW.

ii) Conditions that must be included in the authorisation

Refer to Part A(n) above for compliance to the provisional EA and WUL conditions.

q) Period for which the Environmental Authorisation is required

Until the developer decides to decomission the plant.

r) Undertaking

The undertaking required to meet the requirements of this section is provided at the end of the EMP and is applicable to both the Basic Assessment Report and the EMP.

s) Financial Provision

This is not applicable.

t) Specific Information required by the competent Authority

No specific information was requested.

u) Other matters required in terms of sections 24(4)(a) and (b) of the Act

None envisaged.

PART B

ENVIRONMENTAL MANAGEMENT PLAN

1) Draft environmental management programme

a) Details of the Environmental Assessment Practitioner

Refer to Part A(a) for the requirement for the provision of the details and expertise of the EAP.

b) Description of the Aspects of the activity

Refer to Part A(h)(v) of this BAR.

c) Composite map

Refer to Addendum 1 for all the maps.

d) Description of impact management objectives including management statements

i) All listed and specified activities triggered and being applied for; and

Refer to Part A(d)(i) above.

ii) A description of the associated structures and infrastructure related to the development;

Refer to Part A(d)(ii) above.

f) 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;

(ii) comply with any prescribed environmental management standards or practices;

(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and

(iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable

Refer to Part A(h)(v) above for compliance to prescribed environmental practices and refer to Part A(e) above for compliance environmental legislation and standards.

g) Mechanisms for monitoring the implementation of the impact management actions contemplated in paragraph (f)

1. Site inspection

Mechanism for monitoring compliance	Monitoring and reporting frequency	Responsible persons

• Inspect soil for erosion.	Monthly	Site personnel
• Inspect storage of hazardous substances including bunding of area, 16-point safety data sheet, spill kits, cleaning of spillages and removal of contaminated soil.	Monthly.	
• Inspect storage of all waste, removal and correct disposal of waste, and signs of illegal dumping.	Daily	Site personnel
• Inspect to ensure personnel does not kill animals or remove vegetation.	As necessary	Site personnel
• Inspect areas for alien vegetation.		Specialist
• Monitoring fences to ensure no infringement.	Monthly.	Site manager.
• Inspection of aquatic ecosystems.	As necessary.	Specialist.
• Inspect roads for speeding of vehicles, dust generation and watering of roads.	Daily	Site manager.
• Inspect all new area to be developed for any archaeological deposits.	During construction phase as necessary.	Site personnel
• Inspect all ventilation systems to ensure proper operation.	Daily	Site manager
• Inspect all pumps for overflows into the effluent channels	Monthly.	Site manager
• Inspect all skips to minimise vector attraction	Daily	Site manager

1. Maintenance register

Mechanism for monitoring compliance	Monitoring and reporting frequency	Responsible persons
• Inspect maintenance register to ensure all vehicles and machinery are maintained when necessary. .	Monthly	Construction managers and site personnel
• Pond detection leakage system added to maintenance register.	Monthly	Engineer

2. Rehabilitation plan

Mechanism for monitoring compliance	Monitoring and reporting frequency	Responsible persons
• Revegetation and seeded areas must be monitored to ensure adequate establishment.	During and after revegetation	Site personnel or specialist

h) Monitoring and reporting frequency

Refer above

i) Responsible persons

Refer above

j) Time period for implementing impact management actions

Refer above

k) Mechanism for monitoring compliance

Refer above

l) A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;

The monitoring plan will be audited to ensure effective implementation. The Health Safety and Environmental Manager will conduct internal audits and an EAP will conduct external audits. This will be done annually.

m) Environmental awareness plan

This section includes:

1. Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
2. The manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

The following was extracted from the Environmental training procedure (BECS Environmental, 2016) and is an awareness for the entire site.

i) General environmental awareness training

1. Management will identify environmental awareness needs and related environmental topics.
2. The environmental awareness will include:
   a. The significant environmental impacts, actual or potential, of their work activities and the benefits of improved personal performance; and
   b. The potential consequences of departure from specified operating procedures.
3. Environmental awareness training will form part of the safety talks prior to each shift.
4. Visual aids will be used, where applicable to help with awareness training. These could be in the form of posters displayed at specific work areas after training was done.

n) Specific information required by the Competent Authority

No specific information was requested.

2) Undertaking

The EAP herewith confirms

a) the correctness of the information provided in the reports ☒

b) the inclusion of comments and inputs from stakeholders and I&APs ☒

c) the inclusion of inputs and recommendations from the specialist reports where relevant ☒

d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed ☒

Full names and surname of the EAP	Deshree Pillay
Signature of the EAP	
Name of Company	BECS Environmental
Date	15th May 2019

-END-

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