

EMPr

Environmental Management Programme: Cato Ridge Land Development and Release Project

Annexure K to the Environmental Impact Report

**Cato Ridge Development Company
Limited**

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NOTE: Changes to this report made since the draft EMPr of 14 May 2023, have been marked in blue text (as used here) for ease of reference.

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GLOSSARY

ALOS	Advanced Land Observation Satellite
Amafa	Amafa aKwaZulu-Natali
AOO	Area of Occupancy
AQIA	Air Quality Impact Assessment
ATNS	Air Traffic Navigation Services
BTTS	Base Telecommunications Transmission Station
CA	Competent Authority
CAA	Civil Aviation Authority
CAP	Climate Action Plan
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CGS	Council of Geoscience
CIA	Cumulative Impact Assessment
COGTA	Department of Co-operative Governance and Traditional Affairs
COVID-19	Coronavirus disease
CR	Critically Endangered
CRA	Cato Ridge Alloys
CRDC	Cato Ridge Development Company
CRLHC	Cato Ridge Logistics Hub Consortium
CRW	Cato Ridge Works
CSF	Conceptual Spatial Framework
CSIR	Council of Scientific and Industrial Research
CV	Curriculum Vitae
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
DARD	Department of Agriculture and Rural Development
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs & Development Planning
DEAT	Department of Environmental Affairs and Tourism
DEM	Digital Elevation Model
DFFE	Department of Forestry, Fisheries and Environment
DFO	Dust Fallout
DMOSS	Durban Metropolitan Open Space System
DMR	Department of Mineral Resources
DMRE	Department of Mineral Resources and Energy
DOH	Department of Health
DOT	Department of Transport
DRDLR	Department of Rural Development and Land Reform
DSR	Draft Scoping Report
DTM	Digital Terrain Model
DWAF	Department of Water Affairs and Forestry (now DWS)
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioner Association of South Africa
ECA	Environmental Conservation Act
ECO	Environmental Control Officer
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
EI	Ecological Integrity
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EKZNW	Ezemvelo KZN Wildlife
EM	eThekweni Municipality
EMA	eThekweni Municipal Area
EMPr	Environmental Management Programs
EN	Endangered
EOO	Extent of Occurrence
EPA	Environmental Protection Agency

BMD	Biodiversity Management Department ¹
ES	Ecological Sensitivity
ESA	Environmental Site Agent
ETA	eThekweni Transport Authority
EWS	eThekweni Water and Sanitation
FEPA	Freshwater Ecosystem Priority Area
FESU	Fire and Emergency Services Unit
FPA	Fire Protection Association
FPO	Fire Protection Officer
GDP	Gross Domestic Product
GDS	Growth Development Study
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GN	Government Notice
GPS	Global Positioning System
HGM	Hydro Geomorphic
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IAIA	International Association of Impact Assessment
IAP	Invasive Alien Plant
ICAO	International Civil Aviation Organization
ICT	Inland Container Terminals
IDP	Integrated Development Plan
IEMA	Institute of Environmental Management & Assessment
IHI	Index of Habitat Integrity
ILP	Institute for Lighting Professionals
IPCC	International Panel on Climate Change
IPPU	Industrial Processes and Product Use
IUDF	Integrated Urban Development Framework
KZN	KwaZulu-Natal
KZN DOT	KwaZulu-Natal Department of Transport
KZNSS	KwaZulu-Natal Sandstone Sourveld
LA	Landscape Architect
LAP	Local Area Plan
LED	Local Economic Development
LT	Least Threatened
LUMS	Land Use Management Scheme
LVIA	Landscape and Visual Impact Assessment
mamsl	metres above mean sea level
ML	megalitre
MMFA	Municipal Finance Management Act
MPRDA	Minerals and Petroleum Resources Development Act
MPRs	Municipal Planning Regions
mPVC	Microcellular polyvinyl chloride
MSDF	Municipal Spatial Development Framework
MTREF	Medium Term Revenue and Expenditure Framework
MVA	Mega Volt Amp
NAAQS	National Ambient Air Quality Standards
NATCOR	Natal Corridor
NATMAP	National Transport Masterplan
NBA	National Biodiversity Assessment
NCR	The National Noise Control Regulations
NDA	Non-Disclosure Agreement
NDCR	National Dust Control Regulations
NDP	National Development Plan
NEM: AQA	National Environmental Management: Air Quality Act
NEM: BA	National Environmental Management: Biodiversity Act
NEM: PAA	National Environmental Management: Protected Areas Act
NEM: WA	National Environmental Management: Waste Act
NEMA	National Environmental Management Act
NFA	National Forests Act

¹ Formerly EPCPD

NFEPA	National Freshwater Ecosystem Priority Areas
NHBRC	National Home Builders Registration Council
NHRA	National Heritage Resources Act
NIP	National Infrastructure Plan
NPAES	National Protected Areas Expansion Strategy
NRTA	National Road Traffic Act
NSDF	National Spatial Development Framework
NV	Ngongoni Veld
NWA	National Water Act
OGG	Other Geology Grasslands
OLS	Obstacle Limitation Surface
OSH	Occupational Safety and Health
OWMPR	Outer West Municipal Planning Region
OWSDP	Outer West Spatial Development Plan
PDA	Proposed Development Area
PES	Present Ecological State
PFS	Pre-Feasibility Study
PGDS	Provincial Growth and Development Strategy
PICC	Presidential Infrastructure and Coordinating Commission
PM	Particulate Matter
PoS	Plan of Study
PPP	Public Participation Process
PVC	Polyvinyl chloride
RCIA	Rapid Cumulative Impact Assessment
RCP	Representative Concentration Pathway
RDS	Rural Development Strategy
REC	Recommended Ecological Category
RMO	Resource Management Objective
RoW	Right of Way
SA	South Africa/n
SABAP	Southern African Bird Atlas Project
SACAA	South African Civil Aviation Authority
SACNASP	South African Council for Natural Scientific Professionals
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Resources Information System
SAICE	South African Institution of Civil Engineering
SALA	Subdivision of Agricultural Land Act
SANBI	South African National Biodiversity Institute
SANLC	South African National Land Cover
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SAPS	South African Police Services
SARPs	Standards and Recommended Practices
SCA	Systematic Conservation Assessment
SCC	Species of Conservation Concern
SDB	South Durban Basin
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SEZ	Special Economic Zone
SG	Surveyor General
SIP	Strategic Integrated Project
SMMEs	Small, Medium and Micro Enterprises
SPLUMA	Spatial Planning and Land Use Management Act
SWMP	Stormwater Management Plan
TEU	Twenty-Foot Equivalent Unit
TIA	Traffic Impact Assessment
TVET	Technical Vocational Education and Training
UCVB	Unchanneled Valley Bottom
UDL	Urban Development Line
UHI	Urban Heat Island
UNDP	United Nations Development Plan
UNFCCC	United Nations Framework Convention on Climate Change
uPVC	Unplasticized polyvinyl chloride
VAC	Visual Absorption Capacity

VECs	Valued Ecosystem Components
VN / VU	Vulnerable
VOC	Volatile Organic Compound
WHO	World Health Organisation
WUL	Water Use License
WULA	Water Use License Application
WWTW	Wastewater Treatment Works
ZTV	Zone of Theoretical Visibility

Requirements of Environmental Management Programmes

Appendix 4 of the National Environmental Management Act (Act No 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations 2014 (as amended) specifies the requirements of an Environmental Management Programme (EMPr). The table below serves as a map of how the requirements detailed in Appendix 4 have been adhered to.

Table 1: Requirements of an EMPr as detailed in Appendix 4 of the NEMA EIA Regulations 2014 (as amended).

Requirement		Reference
1(a)	(i) details of the EAP who prepared the EMPr; and	Section 1.4
	(ii) details of the expertise of that EAP to prepare an EMPr, including a curriculum vitae	Section 1.4
1(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 2
1(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Appendix 1
1(d)	a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including -	Section 3, 4.15 & 6
	(i) planning and design;	Section 4.15
	(ii) pre-construction activities;	Section 4.15 & 6
	(iii) construction activities;	Section 4.15 & 6
	(iv) rehabilitation of the environment after construction and where applicable post closure;	Section 4.15 & 6
	(v) where relevant, operation activities;	Section 7
1(e)	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d)	Section 5, 6, 8 & 9
1(f)	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	Section 4.15, 6, 7 & 9
	(i) (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 3, 4.15, 6, 7 & 9 and All Tables
	(ii) (ii) comply with any prescribed environmental management standards or practices;	Section 3, 4.15, 6, 7, 9 & 10
	(iii) (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	Section 4.13 Section 9.2.7 & 9.2.2 Section 9
	(iv) (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	N/A
1(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 4.10 and Section 4.15, 6, 7 & 9
1(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f)	Section 4.10 and Section 4.15, 6, 7 & 9
1(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 4.10 and Section 4.15, 6, 7 & 9
1(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 4.15, 6, 7 & 9
1(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 4.10
1(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 4.10
1(m)	an environmental awareness plan describing the manner in which -	Section 4.12
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 4.12
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 4.12
1(n)	any specific information that may be required by the Competent Authority.	None to date.

1 OVERVIEW

1.1 PURPOSE OF THIS EMPR

The purpose of this document is to provide environmental management practices and recommendations to ensure that the known and possible impacts associated with the proposed Cato Ridge Land Development and Release project and its associated infrastructure are avoided, managed, mitigated and/or kept to acceptable levels. This EMPr is thus intended for use by all role players in the development of the project, but most importantly will form part of the contract documentation for all Contractors pertaining to the construction and operation of the project. The recommendations included herein apply to the following stages of the proposed development:

- Planning and design.
- Pre-construction and construction.
- Operation; and
- Closure and decommissioning

This EMPr aims to provide for long-term management of the study area, through measures to address, *inter alia*, control and eradicate alien and invasive species, manage stormwater, control erosion, rehabilitate and restore ecosystems and mitigate other environmental impacts that would allow for the monitoring and control of activities associated with the Project. This EMPr be appended to any sales or lease agreements and will be binding on prospective tenants/ developers.

This EMPr aims for alignment and optimisation of environmental management processes with conditions of authorisations that may arise. Any conditions of authorisation contained in the Environmental Authorisation (EA) that contradict the recommendations made in this EMPr, supersedes the recommendations of this document. Prior to development, the EMPr must be updated to contain all conditions of authorisation contained in the EA, any relevant conditions of other environmental and/or land use permits and be modified as per specialist recommendations as a result of micro-siting. Once any required amendment/ updates/ modifications have been made to the EMPr, it will be made available to stakeholders for a 30-day comment period, whereafter the final EMPr and layout will be submitted to the Competent Authority (CA) for decision-making.

The intention is also that the document is dynamic, and that improvements and inclusions can be added as the project progresses and as the need arises, granted the necessary authorisations for such amendments are acquired.

A hard copy of the EMPr must always be in the site office and made available to officials upon request.

1.2 LEGAL REQUIREMENTS OF AN EMPR

The content of EMPRs must meet the requirements in Section 24N (2) and (3) of NEMA and Appendix 4 of the NEMA EIA Regulations 2014. Appendix 4 of the EIA regulations specify the required contents of an EMPr. This (see **Table 1** above) and the guideline of the Western Cape Department of Environmental Affairs & Development Planning (DEA&DP)^{2, 3} *Guideline for Environmental Management Plans* (2005) have been considered in compiling this document.

The DEA&DP guideline defines an EMPr as:

“An environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced”.

The EMPr must address the potential environmental impacts of the proposed activity on the environment throughout the project life cycle, including an assessment of the effectiveness of monitoring and management arrangements after implementation. EMPRs must be submitted together with the Environmental Impact Report (EIR) so that they can be considered simultaneously. Section 24N (2) and (3) of the NEMA lists the requirements of an EMPr presented in **Table 2**.

Table 2: Requirements of an EMPr according to Section 24N (2) and (3) of the NEMA

24N. (2)	<i>the environmental management programme must contain-</i>
(a)	<i>information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of –</i>
	<i>(i) planning and design.</i>
	<i>(ii) pre-construction and construction activities.</i>
	<i>(iii) the operation or undertaking of the activity in question.</i>
	<i>the rehabilitation of the environment; and closure, where relevant.</i>
(b)	<i>details of –</i>
	<i>(i) the person who prepared the environmental management programme; and</i>
	<i>(ii) the expertise of that person to prepare an environmental management programme</i>
(c)	<i>a detailed description of the aspects of the activity that are covered by the draft environmental management plan.</i>
(d)	<i>information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a).</i>
(e)	<i>information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on compliance.</i>
(f)	<i>as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and</i>
(g)	<i>a description of the manner in which it intends to-</i>
	<i>(i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation.</i>
	<i>(ii) remedy the cause of pollution or degradation and mitigation of pollutants; and</i>
	<i>(iii) comply with any prescribed environmental management standards or practices.</i>
(3)	<i>the environmental management programme must, where appropriate-</i>
(a)	<i>set out time periods within which the measures contemplated in the environmental management programme must be implemented.</i>
(b)	<i>contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting area or mining area in question; and</i>
(c)	<i>develop an environmental awareness plan describing the manner in which-</i>
	<i>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</i>
	<i>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.</i>

² The DEA&DP's guideline is used even though the proposed project is based in the KwaZulu Natal Province, as there is no national EMPr guideline.

³ Lochner, P. 2005. *Guideline for Environmental Management Plans*. CSIR Report No ENV-S-C 2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

1.2.1 Listed Activities in terms of NEMA.

The NEMA provides the framework for environmental decision-making in the country. The EIA Regulations serve as the specific instrument through which development decisions are made.

South Africa has rigorous and comprehensive environmental legislation aimed at preventing environmental degradation. Section 28(1) of NEMA places a “duty of care and remediation of environmental damage” on every person who causes, has caused, or may cause, significant environmental degradation. This is a far-reaching obligation, and accordingly, those parties responsible for the degradation of the environment have a legal duty to avoid, minimise or mitigate such impacts.

This has resulted in a set of Listed Activities that can be triggered by developments of a certain nature and/or taking place in sensitive environments, e.g., watercourses. If a development triggers a Listed Activity, the EIA Regulations required it to undergo an Environmental Impact Assessment (EIA) through a Basic Assessment (BA) process or Scoping and Environmental Impact Report (SEIR). The following listed activities have been identified as being applicable to this proposed project:

Table 3: Applicable listed activities in terms of GN No. 983 of 2014 (Listing Notice 1)

Act No.	Listed activity	Relevance of the activity
9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or stormwater— (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more. excluding where— (a) such infrastructure is for bulk transportation of water stormwater or stormwater drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	The Project includes the development of water and stormwater pipelines (linking to the surrounding reticulation) and attenuation ponds. The bulk water and stormwater pipelines will be located inside and outside existing road reserves and will exceed 1000 metres in length. The proposed bulk stormwater infrastructure maybe 0.4 or more metres in diameter with a peak throughput of greater than 120 litres per second. The diameter and throughput may exceed the thresholds mentioned for stormwater infrastructure.
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is— (b) 2 kilometres or shorter in length.	The following transmission lines are proposed: Phase 1 (PDA 2): Approx. 788 m long 33 kV powerline from CRW to the new southern substation within Phase 1 (PDA 2). Phase 2 (PDA 3) – two alternative options: - Option 1 – (eastern) requires approx. 384 m 33 kV powerlines – described as “electrical cable with 7 m servitude” below ground. The proposed substation is outside of the Assmang/CRDC landholdings and within an existing substation complex. - Option 2 – (western) requires approx. 638 m 132 kV overhead powerlines with 36 m servitude. The proposed substation and powerline are proposed on Assmang/ CRDC land outside the proposed Phase 2 (PDA 3) footprint. The total length of the proposed transmission lines is between 1172 – 1426 m. Note that only Phase 2 Option 2 electrical connections exceed the specified 33kV
12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres: or	While the revised layout avoids all watercourses and wetlands with the main development, the stormwater and effluent discharge points will take place within 32 m

Act No.	Listed activity	Relevance of the activity
	(ii) infrastructure (including borrow pits) or structures with a physical footprint of 100 square metres or more. where such development occurs— (a) within a watercourse. (b) in front of a development setback; or I if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse: — excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. (cc) activities listed in Activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies. (dd) where such development occurs within an urban area. (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	of natural drainage lines or wetlands and exceed 100 square metres together and therefore would trigger this activity.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse. but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback. (b) is for maintenance purposes undertaken in accordance with a maintenance management plan. It falls within the ambit of activity 21 in this Notice, in which case that activity applies. (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or I where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	Excavation, removal and infill of soil may be required to allow the placement of stormwater and effluent discharge points/structures within the watercourse may require excavation and infilling of materials.
26	Residential, retail, recreational, tourism, commercial or institutional developments of 1 000 square metres or more, on land previously used for mining or heavy industrial purposes: — excluding — (15) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or (iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum	From the aerial imagery and based on recent site visits, there is evidence of small-scale, unlicensed sand mining at sites across the study area (see photographs below, dated August 2021). A high level of sand mining activity was evident at the site of the proposed Option 2 powerline servitude, west of Phase 2 (PDA 3) footprint. For this reason, any development within the already disturbed sand mining areas would trigger this activity.

Act No.	Listed activity	Relevance of the activity
	Resources Development Act, 2002 (Act No. 28 of 2002) for such land.	
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (15) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare. excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The proposed development would be developed on vacant land currently used for grazing by the surrounding communities, which constitutes an agricultural activity. This development would occur outside an urban area, where the total land to be developed will exceed 1ha. This activity will therefore be applicable.
45	The expansion of infrastructure for the bulk transportation of water or stormwater where the existing infrastructure- has an internal diameter of 0,36 metres or more; or has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1 000 metres in length: or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more. excluding where such expansion- (aa) relates to the transportation of water or stormwater within a road reserve or railway line reserve; or (bb) will occur within an urban area.	The upgrades of the bulk water supply would exceed 1,000m in length and will be located outside an urban area. The dimensions and throughput of the existing infrastructure are currently unknown, however, once these are confirmed this activity will be confirmed. Due to the expansion length, it is anticipated that this activity could be applicable.
46	The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes where the existing infrastructure— has an internal diameter of 0,36 metres or more: or has a peak throughput of 120 litres per second or more; and where the facility or infrastructure is expanded by more than 1 000 metres in length: or where the throughput capacity of the facility or infrastructure will be increased by 10% or more. excluding where such expansion— (aa) relates to the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes within a road reserve or railway line reserve; or (bb) will occur within an urban area.	The upgrades of the bulk sewer system would exceed 1 000 metres in length and will be located outside an urban area and mostly outside of road reserves as well. The dimensions and throughput of the existing infrastructure are currently unknown, however, once these are confirmed, this activity will be confirmed. Due to the expansion in length, it is anticipated that this activity could be applicable.
56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— (15) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres:	Proposed road upgrades may include the widening of existing roads, including Eddie Hagen Drive.

NOTE: The modular wastewater treatment plant and effluent discharge point constructed for Phase 1 will service the development until a connection to the future planned Municipal truck sewer and Hammarsdale Wastewater Treatment Works (WWTW) can be established around 2032 when the new trunk sewer and upgrades of Hammarsdale WWTW are commissioned. At that time the modular wastewater treatment plant and discharge point would no longer be required and will be decommissioned. At that time, the closure and decommissioning of this facility would trigger Activity 31 of Listing Notice 1 and would require Environmental Authorisation.

Table 4: Applicable listed activities in terms of GN No. 984 of 2014 (Listing Notice 2)

Act No.	Listed activity	Relevance of the activity
15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	This activity is applicable since the proposed development footprint across the entire study area exceeds 20 ha in extent.
27	The development of a road—catering for more than one lane of traffic in both directions.	Proposed roads will include dual-carriageway roads.

Table 5: Applicable listed activities in terms of GN No. 985 of 2014 (Listing Notice 3)

Act No.	Listed activity	Relevance of the activity
4	The development of a road wider than 4 metres with a reserve of less than 13,5 metres. d. KwaZulu-Natal viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans. x. Areas designated for conservation use in Spatial Development Frameworks adopted by the Competent Authority, or zoned for a conservation purpose;	The proposed internal access roads will be 7m wide with a reserve of 20 m, which will exceed the 13,5m threshold. These roads will also transect CBA areas as well as DMOSS areas. Current footprint calculations indicate the following areas will be impacted by the development (to be revised in the EIA phase): • DMOSS – 265.59ha • CBA – 33.44ha
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a Maintenance management plan. D. KwaZulu-Natal iv. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or before the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004. v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans. xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the Competent Authority or zoned for a conservation purpose	The proposed development would result in the clearance of more than 300m ² of indigenous vegetation and this clearing would affect endangered vegetation (KZNSS), CBAs and DMOSS areas (as approved by the Municipal Planning Tribunal and eThekweni City Council in 2016 (SDF, 2020)). Therefore, this activity would be applicable. Total KZNSS within all 3 phases is: 349.8ha Total KZNSS in Phase 1: 132.4ha Total KZNSS in Phase 2: 173.8ha Total KZNSS in Phase 3: 43.6ha The status of the KZNSS is unclear and ranges from vulnerable to Critically Endangered depending on the source. The Vegetation specialist recommends it be viewed as “endangered” for the identification of activities in the EIA listing notices.
14	The development of— dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres: or	Based on desktop data and the results of the freshwater and aquatic ecosystem assessment there is no river crossing by roads or other infrastructure in the current layout.

Act No.	Listed activity	Relevance of the activity
	infrastructure or structures with a physical footprint of 10 square metres or more. Where such development occurs – within a watercourse. in front of a development setback; or if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse. d. KwaZulu-Natal vii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans.	However, the effluent and stormwater discharge points (erosion control structures) will be located within 32m of the drainage line and will, collectively, exceed 10 square meters of footprint within 32m of the drainage line.

1.3 STRUCTURE OF THE EMPR

The EMPr has been structured to include the following sections to address environmental management throughout the project life cycle:

- Chapter 1: Overview of The Project and legal context
- Chapter 2: Project description
- Chapter 3: Summary of the impacts assessed in the EIA.
- Chapter 4: Implementation of the EMPr, detailing the roles and responsibilities of the various role players involved in the implementation of this EMPr, compliance inspection, monitoring, record keeping and method statements.
- Chapter 5: Environmental Impacts and Mitigations
- Chapter 6: Summary of Impacts and Associated Mitigations, Pre-construction and Construction phase requirements
- Chapter 7: Non-compliance and Penalties
- Chapter 8: Operational Phase generic environmental management practices
- Chapter 9: Decommissioning phase provisional considerations
- Chapter 10: Permits, Plans and Programmes

1.4 EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Section 33 of EIA Regulations and Section 24N (2) and (3) of the NEMA require that an EMPr must include the details of the person(s) who prepared the EMPr, and the expertise of that person to prepare an EMPr. Zutari has selected a team of highly experienced specialists and multi-disciplinary practitioners to execute this project in a professional and unbiased manner. A synopsis of the qualifications and experience of Zutari's environmental assessment team for this project is provided hereunder. Full Curricula Vitae (CVs) are available in Appendix A.

The Lead Environmental Assessment Practitioner (EAP), Patrick Killick is a senior environmental practitioner at Zutari with significant on-site experience in the supervision, management and monitoring of construction-related environmental impacts and occupational health and safety associated with the construction of dams, roads, pipelines, underground works, weirs, and residential villages.

Patrick's impact assessment experience arose from a variety of projects and industries whilst undertaking environmental impact studies and other regulatory and planning processes for various developments within South Africa, Angola, Mozambique, Tanzania and Namibia. His project experience centres on areas of municipal bulk water supply and wastewater treatment infrastructure, waste management facilities (including H:h landfill class), bulk thermal power generation (gas, HFO and coal), utility-scale renewable energy projects (wind and solar), seawater desalination (SWRO) including associated marine, estuarine and coastal issues, open pit mining (coal and uranium) and associated mining infrastructure.

Patrick has a master's degree in environmental management from the University of the Free State (UFS), is a member of the International Association for Impact Assessment South Africa (IAIASa) and a Registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA), Reg. No. 2021/4095.

1.5 PROJECT PHASING

1.5.1 Planning and Design Phase

This phase includes applications for environmental, town planning and other relevant authorisations. The planning and design phase investigates the possible impact of the proposed development on the receiving environment and recommends mitigation measures. This phase would have been concluded once the contractor views this document.

It must be noted that the proposed project will include both the leasing and sale of land to future end users. In the event of a land sale, the Listed Activities issued under this EIA process, together with the responsibilities outlined in this EMP, will be transferred to the new landowner. Should sites be leased to future end users, the conditions of Environmental Authorisation together with this EMP, will form part of the legally binding agreement between CRDC and the future end user.

An environmental legal review must be completed for all future end-user activities, to ensure it aligns with the approved EIA and EMP. Should the future end user/ new landowner intend to conduct an activity that is not approved under this EIA Process and EMP, a separate environmental assessment process will need to be completed (together with associated permit requirements, if applicable). The specific requirements for a separate environmental assessment process will be subject to a detailed review of relevant environmental legislation and agreement with the appropriate environmental authority.

1.5.2 Pre-construction Phase/Activities

The pre-construction phase includes activities such as:

- Pre-Construction monitoring.
- Appointment of the contractor/consultants.
- The contractor develops a code of conduct for employees.
- Appointment of an Environmental Control Officer (ECO) and contractors and consultants.
- Pre-construction environmental workshop/induction training of all employees.
- Site demarcation.
- Establishment of a site camp.
- Demarcation of areas such as fuel areas and plant search and rescue (when applicable).
- Processes to obtain permits e.g., permits required to remove protected trees or plants.
- Finalisation of design.
- Where sites are leased to end-users, the developer must undertake an environmental legal screening to ensure the plans (once final) are aligned with the provisions of the EA or, where required, additional authorisations and permits are applied for under the relevant legislation. The legal screening must be submitted to KZN EDTEA for review and confirmation before commencement, and
- Finalisation of additional management and monitoring plans.

1.5.3 Construction Phase

The construction phase commences with earthworks and thereafter includes activities relating to the construction of the proposed development e.g., construction of an internal road network, construction of bulk internal water reticulation network, internal sewer reticulation network, site foundations, stormwater infrastructure, and installation of other services associated with the Project. At the start of this phase, the contractor is required to develop Construction Method Statements.

1.5.4 Operational Phase

The operational phase commences when site-specific development plans are available from the ultimate end users within the development and the site is handed over to the end user. Where sites are sold off to end users, these users would need to undertake a site-specific assessment to ensure alignment with the EA, licenses and permits. Confirmation of alignment with authorisations and permits will be determined once the sale of the property has been finalised with the future end users.

1.5.5 Decommissioning Phase

The decommissioning phase refers to the discontinuation of the precinct and the removal of all associated infrastructure. This would entail dismantling the internal roads, stormwater network, and all associated infrastructure. Rehabilitation of the site to a suitable end use would also form part of the decommissioning phase leading to closure. It is highly unlikely that the precinct would be demolished. The intention is to continue with the project for as long as the developed project is sustainable and it is not anticipated that decommissioning will occur in the foreseeable future, apart from the onsite modular wastewater treatment plant that will be decommissioned once municipal infrastructure capacity has increased.

2 PROJECT DESCRIPTION

The applicant intends to rezone and subdivide the property for the development of a three-phase light industrial, warehousing and logistics precinct with bulk service connections. Serviced erven are to be sold or leased to end-users either individually or collectively. The applicant will not develop industrial facilities but will provide the bulk infrastructure and land use zonings to enable tenants/buyers of industrial erven to develop such facilities. The bulk infrastructure planned to be developed are:

- A Modular Wastewater Treatment Plant (MWTP), with a maximum capacity of 2Ml per day. This facility will be incrementally developed based on demand and will be decommissioned once the municipal trunk sewer is installed.
- A sewer reticulation network, including collection sumps and pump stations.
- A water reticulation network, including pump stations.
- An elevated water tower.
- Internal road network including stormwater management attenuation ponds, erosion protection measures and channels.
- Upgrade of Eddie Hagen Road; and
- Underground or overhead electricity transmission lines and associated substations.

Site-specific infrastructure on the proposed industrial erven will be determined once the development or sale/lease of properties is finalised with individual end-users.

The final building designs/plans for each erf are to be drafted and submitted by the end-user to the municipality for approval, in terms of the Land Use Management Scheme (LUMS) and associated building regulations. The building designs/plans will inform the possible need for future applications for EA as they relate to bulk infrastructure projects and/or other activities that are beyond the scope of this initial development.

The proposed development will be implemented in three phases, encompassing a total of 351 ha⁴. The sizes of each phase are shown in **Table 6**.

Table 6: Sizes of development phases

Phase	Actual hectares	Rounded up hectares
Phase 1	130.87	131
Phase 2	174.03	174
Phase 3	45.97	46
Total	350.87	351

Phase 1 and 3 combined (176.84 ha) will be leased or sold for development at various stages across the approved project footprint, while the remaining 174.03 ha of phase 2 will be developed later once key municipal service and infrastructure upgrades have taken place. Table 7 represents the bulk service requirements and externalities relative to the release of development hectares across the site. The project layout is provided in Figure 1 below.

The modular wastewater treatment plant and effluent discharge point for Phase 1 will service the development until a connection to the future planned municipal trunk sewer and Hammarsdale Wastewater Treatment Works (WWTW) can be established around 2032. At that time the MWTP and discharge point would no longer be required and will be decommissioned. The closure and decommissioning of this facility would trigger Activity 31 of Listing Notice 1 and would require an EA.

⁴ Refer to the EIR for a detailed explanation of the phasing. In summary, Phase 1 of The Project refers to the release and development of the first 176.84 ha of the development footprint, which includes Phases 1 and 3 development area. Phase 1 sites will be located anywhere across the approved development footprint (Phase 1,2 or 3),

Table 7: Breakdown of bulk services requirements relative to the equivalent development hectares

Phase	Area	Bulk Service Requirements (linked to equivalent hectares for development)	Timing
Phase 1	131 ha	• Phase 1 Biodiversity offsets: the specified biodiversity offsets for a 131ha development equivalent secured. • Internal roads: internal roads, with traffic controls, markings, and signage. • The existing Road Network, once approximately 80 hectares of development area can be unlocked: i. Signalisation of Cato Ridge Interchange. ii. Upgrade Eddie Hagan Drive – The first 662m of Eddie Hagan Road would need to be upgraded by the Provincial Department of Transport (DOT)/ Developer to provide additional capacity. This will include upgrading the Eddie Hagan/ Assmang Access West intersection & the Eddie Hagan/R103 intersection. iii. The above road upgrades will provide additional capacity to increase the development to 160 hectares. • Bulk water: water supply pipelines within road reserve connected with municipal supply. • WWTP: Installation of new 2 ML onsite WWTP (Progressively upgraded in 250kl modules to a maximum of 2ML to meet demand). Note the first sites would need conservancy tanks until sufficient sewage volumes are available to commission the first 250kl module. • Bulk Sewers: sewer collection pipeline network, collection sump and pump station. • Bulk Stormwater: roadside pipes, drains, diversion works, attenuation ponds, and discharge points with erosion protection. • Bulk electrical: new bulk power supply line and substation connecting with the 11kV underground powerline reticulation system. • Operations Area and Staff Facilities: Supporting infrastructures such as offices, ablution facilities, parking lots, paved areas, access roads, storage areas and access-controlled areas (subject to end-user requirements).	Years 1 - 10
Phase 2	174 ha	• Phase 2 biodiversity offsets: the specified biodiversity offsets for a 174.03 ha development equivalent secured. • Internal roads: internal roads, with traffic controls, markings, and signage. • Bulk water: water supply pipelines within road reserve connected with municipal supply. • Bulk sewers: sewer collection pipeline network, collection Chamber and pump station with rising main. • Bulk stormwater: roadside pipes, drains, diversion works, attenuation ponds, and discharge points with erosion protection. • Bulk electrical: new bulk power supply line and substation connecting with the 11kV underground powerline reticulation system serving the Phase 2 areas. • 500 kℓ elevated storage tank. • Operations Area and Staff Facilities: Supporting infrastructures such as offices, ablution facilities, parking lots, paved areas, access roads, storage areas and access-controlled areas (subject to end-user requirements). • Externalities (required for Phase 2): • 38ML water reservoir – facilitate water supply to the precinct and surrounds (eThekwin Municipality to complete). • Hammarsdale WWTW upgrade – Upgrade from 9 ML to 42 ML (eThekwin Municipality to complete).	Years 11 – 20

Phase	Area	Bulk Service Requirements (linked to equivalent hectares for development)	Timing
		• Bulk Trunk sewer (est. for 2032) – connecting Cato Ridge/ Harrison Flats to Hammarsdale WWTW responsibility of (eThekweni Municipality). • Existing Road Network: The following upgrades will be required: • At 160 hectares of development, upgrading the Eddie Hagen Drive north with additional lanes in each direction from Eddie Hagen/Assmang intersection to the Eddie Hagen/Drakensberg intersection. • In addition, two options can be explored to unlock further developable areas, from a road capacity perspective concerning interventions on the N3 as follows: • Option 1 – Construction of the KwaXimba interchange (either in its entirety or potentially in a phased manner). The development of the full KwaXimba interchange would unlock the full 351-hectare development, or • Option 2 – If the KwaXimba interchange is delayed or absent, further investigations into the upgrading of the N3 Cato Ridge and N3 Hammarsdale interchanges (including new ramps, roads etc) would be required. This would also include potential upgrades to large sections of the R103 and further upgrades to the Eddie Hagen Drive as well, but further investigations are required on this. Based on these investigations, a determination can be made as to the extent of the developable area that can be unlocked with Option 2.	
Phase 3	46 ha	• Phase 3 Biodiversity offsets: the specified biodiversity offsets for a 45ha development equivalent secured. • Internal roads: internal roads, with traffic controls, markings, and signage. • Bulk water: water supply pipelines within road reserve connected with municipal supply. • Bulk Sewers: sewer collection pipeline network, new collection chamber and pump station with rising main. An incremental increase in the Wastewater Treatment Works capacity will be established and expanded through Phase 1. • Bulk Stormwater: roadside pipes, drains, diversion works, attenuation ponds, and discharge points with erosion protection. • Bulk electrical: new bulk power supply line connecting underground to the substation. • Operations Area and Staff Facilities: Supporting infrastructures such as offices, ablution facilities, parking lots, paved areas, access roads, storage areas and access-controlled areas (subject to end-user requirements).	Years 21 – 25 or sold off in Phase 1 and developed in the period 1 – 10 years)
Total	350.87		Up to 25 years

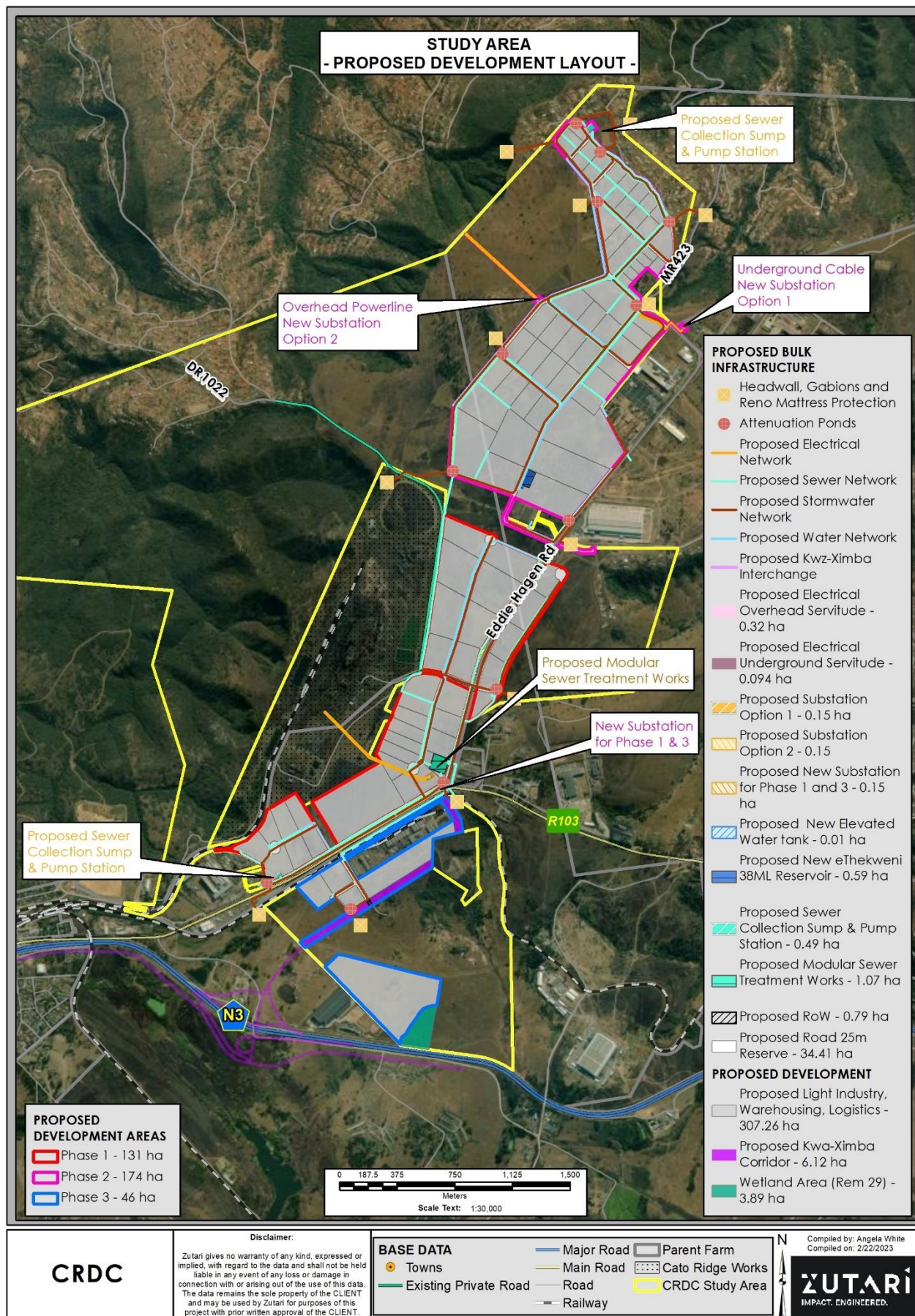


Figure 1: Project layout

2.1 SITE LOCALITY

The study area is located in Cato Ridge near the western boundary of the eThekweni Metropolitan Municipality, in the KwaZulu Natal Province and is situated adjacent to and north of the N3 highway as shown in **Figure 2** below. Cato Ridge is located approximately 51km northwest of Durban and 29km southeast of Pietermaritzburg on the N3.

The study area covers a total area of 1,262.248 ha and encompasses properties owned by Assmang and CRDC. The R103, which serves as an alternative route to the N2 between Durban and Pietermaritzburg, bisects the study area. A central railway line and associated sidings, the Nata Corridor (Natcor), also divides the area and provides general accessibility to the informal and agricultural areas located to the north and south.

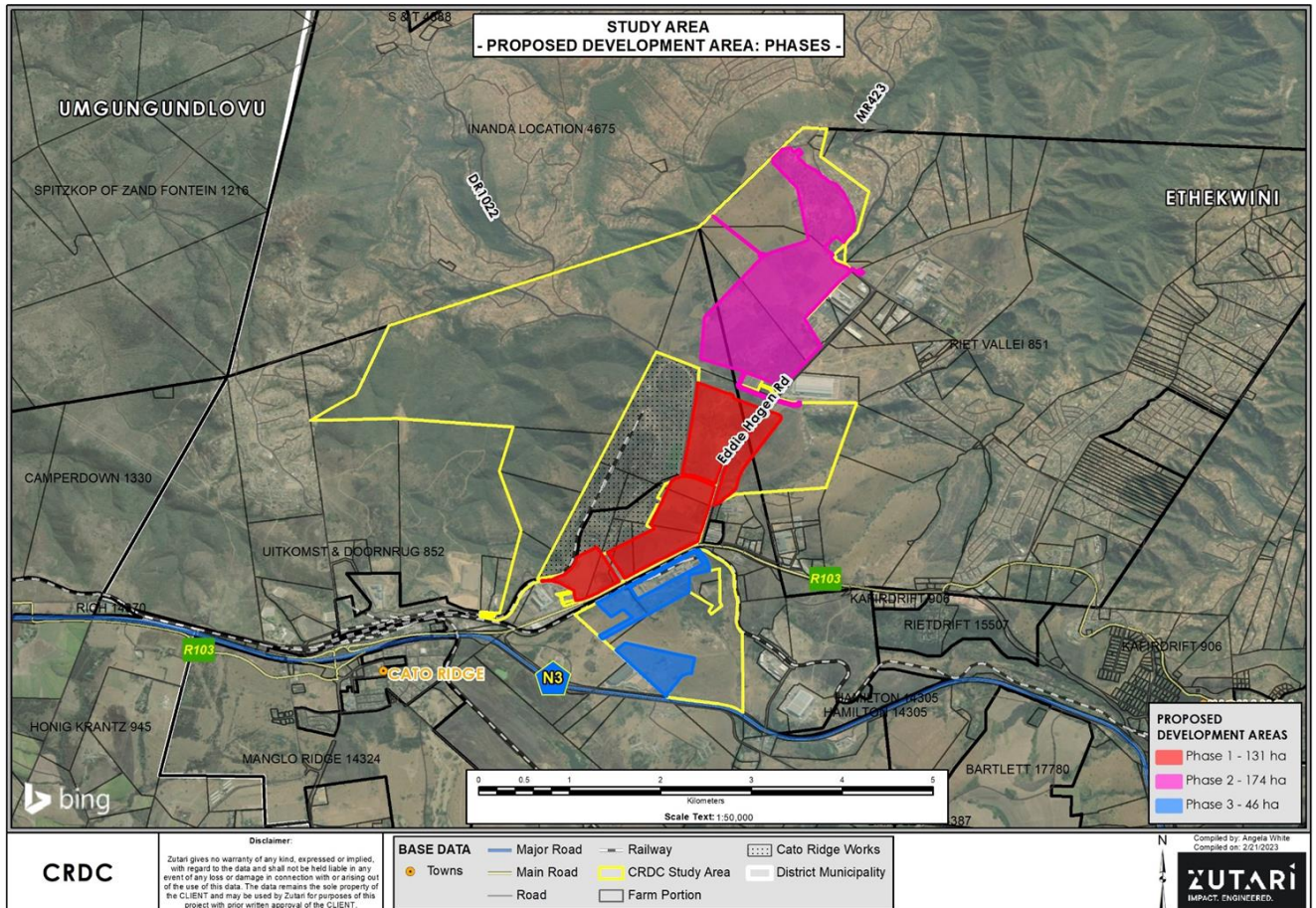


Figure 2: Proposed Phases in relation to the study Area

2.1.1 Proximity to the NCP Chlorchem MHI Facility

End-users situated within 1km of the NCP Chlorchem Major Hazardous Installation (MHI) located at 2001 Old Main Road, Cato Ridge, KwaZulu-Natal GPS co-ordinates: 29°43'28.75"S 30°37'22.75"E must be aware of the presence of this facility when securing sites or entering lease agreements. The facility receives (by road transport), stores and handles compressed chlorine gas. All areas within 1km of the site may be impacted under a catastrophic or worst-case scenario incident. Consequently, landowners would need to cooperate with NCP Chlorchem regarding their emergency provisions and plans and provide NCP Chlorchem with the following information for their emergency planning:

- The type of industry and general activities taking place on their site;
- Number of staff on-site; and
- Emergency contact information

2.2 PROJECT EXCLUSIONS

The Proposed Project is limited to light industrial, warehousing and logistics. The following activities are **excluded** from the current EIA process, and if required, will be subject to further environmental assessments based on the nature of these unapproved activities:

- Heavy industrial activities, including Noxious activities.
- Any activities such as hazardous waste generation as well as activities linked with waste storage, treatment and disposal, that trigger the requirements of the National Environmental Management: Waste Act.
- Any activities that trigger the requirements for the National Environmental Management: Atmospheric Emissions Act.
- Any activities that trigger the requirements for a Major Hazardous Installation.
- Energy generation activities that trigger requirements in terms of NEMA EIA Regulations.
- Any requirements that trigger the requirements in terms of the Hazardous Substances Act. Any activities not approved in the Water Use License, issued for the Project.

Note that the commencement of any listed activities that are not authorised may attract significant criminal and administrative penalties in terms of the NEMA. It is critical that a legal environmental screening be undertaken for each leased/sold site as soon as the plans for each end-user site have been determined, and these must be verified with EDTEA before commencement. Where required additional applications for environmental authorisation must be applied for as provided for by the 2014 NEMA EIA Regulations (as amended).

2.3 LEGAL FRAMEWORK

Legal and policy requirements applicable to the project are discussed in the sections below.

2.3.1 Relevant Legislation

An overview of the relevant legislation is provided in **Table 8** below.

Table 8: Relevant legislation and the applicability thereof

Legislation	Authority	Relevance
Aviation Act (74 of 1962)	Civil Aviation Authority (CAA)	In terms of the results of the web-based national screening tool (accessed on 11-12 August 2021), the proposed development footprint falls within 8 km of “other civil aviation aerodrome”. A Civil Aviation Assessment was undertaken of the Environmental Assessment Report (EIR). Further engagement with the CAA will be undertaken by CRDC in this regard to establish any building restrictions or safety guidelines. Zutari compiled an Initial Obstacle Limitation Surface (OLS) Assessment Report. The study area is close to several airfields including Sunset Ridge Farm (Emoyeni) Airstrip, the Light Flight Airstrip, the Grass Roots Airfield, Cato Ridge airfield and the identified Model Aeroplane Sites. The study found that The Project will not cause any protrusion on the OLS of the identified airfields. No further assessment is required, as the precinct footprint has only been reduced since the study and no masts or potential obstacles have been added to The Project that would alter this finding.
Conservation of Agricultural Resources Act	Department of Agriculture, Land Reform and Rural	The purpose of this Act is to ensure that the natural agricultural resources of South Africa are conserved through maintaining the production potential of land, combating and preventing erosion, preventing the weakening or destruction of water sources, protecting

Legislation	Authority	Relevance
(43 of 1983) (CARA)	Development (DALRRD)	vegetation, and combating weeds and invader plants. Most of the provisions are accounted for in more recent legislation such as NEM: BA and NEMA and no applications are required in terms of CARA. Measures to mitigate potential impacts on agricultural resources, such as soil erosion, alien invasion and protection of vegetation and water resources, will be addressed in the EIA Phase and included in the EMPr.
Environmental Conservation Act (73 of 1989) (ECA)	Department of Forestry, Fisheries and Environment (DFFE)	The ECA has now largely been replaced by the NEMA but certain provisions remain in force. Section 21 of the ECA relates to the control of activities that may have a detrimental effect on the environment, which require written authorization issued by the relevant authority. The national Noise Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCR) were promulgated in terms of Section 25 of the ECA, relating to noise, vibration and shock. The NCRs were revised under Government Notice Number R55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. In accordance with the Act, two procedures exist for assessing and controlling noise, respectively: • South African National Standard (SANS) 10328:2008 'Methods for environmental noise impact assessments. • SANS 10103:2004 'The measurement and rating of environmental noise with respect to annoyance and speech communication'. The proposed development is likely to increase ambient noise levels during the construction (temporary) and operational phases. Noise impacts are closely related to construction activities and heavy traffic volumes. The EMPr will include measures relating to the mitigation of noise impacts.
Hazardous Substances Act (Act 15 of 1973)	Department of Health	The Hazardous Substances Act aims to control the production, import, use, handling and disposal of hazardous substances. Under the Act, hazardous substances are defined as toxic substances, corrosive, irritant, strongly sensitising, flammable and pressure-generating under certain circumstances and may injure, cause ill health or even death in humans. Where hazardous substances from any of the 4 groups below are to be used, (see below) care must be taken to ensure that they are sourced from an appropriately licensed source, transported, handled and disposed of in compliance with the provisions of the Act. • Group I: industrial chemicals (IA) and pesticides (IB) • Group II: 9 classes of wastes excluding Class 1: explosives and class 7: radioactive substances. • Group III: electronic products and group • Group IV: radioactive substances • The list of group IA hazardous substances is provided in the Act.

Legislation	Authority	Relevance
		The proposed land use options will <u>not</u> include heavy or noxious industrial land uses due to the proximity to settlements.
KwaZulu-Natal Provincial Conservation Ordinance (15 of 1974)	EKZNW	The 1974 KwaZulu-Natal Provincial Conservation Ordinance provides special protection to a range of indigenous plant species, including tree species and smaller herbs. These plants may not be disturbed, damaged, destroyed or relocated without permit authorization from the provincial conservation authority EKZNW. Many smaller protected herbaceous species occur on Assmang's Cato Ridge landholdings (see Table 7 in the Baseline Vegetation Assessment).
Minerals and Petroleum Resources Development Act (28 of 2002) (MPRDA)	Department of Mineral Resources and Energy (DMRE)	In terms of section 53 of the MPRDA, any person who intends to use the surface of any land in a manner that may be contrary to the objects of the MPRDA or is likely to impede such objects must apply to the Minister for approval in the prescribed manner. Once the layout is sufficiently distilled (i.e., after the official Scoping Phase) an application will be made to the Minister to obtain a letter of approval. As per the requirements of the MPRDA, all mining activities, including the extraction of material from borrow pits and quarries, require authorisation from DMR. There is evidence of existing small-scale illegal sand mining activities taking place on the Assmang / CRDC landholdings.
National Environmental Management Act (Act 107 of 1998) (NEMA)	DFFE EDTEA	NEMA, as amended, provides the framework for environmental decision-making predominantly through the EIA Regulations (GN No. R982 in the Government Gazette of 8 December 2014, as amended) which serve as the instrument through which development decisions can be made. Specifically, for those developments which comprise certain 'listed activities' identified in GN R983, R984 and R985 (as amended on 7 April 2017), that are considered to have potentially detrimental impacts on the environment. Several listed activities will be triggered by The Project and EA must therefore be sought via a Scoping and EIA process as per the requirements of the 2014 EIA Regulations (GN R982, as amended). The Act also sets out various principles that have been adopted in this Scoping and EIA process e.g., the precautionary principle, duty of care, and polluter pays principle
National Environmental Management: Air Quality Act (39 of 2004) (NEM: AQA)	EDTEA eThekweni Municipality (EM): Environmental Health	The Act aims to regulate and protect the environment by providing reasonable measures for the prevention of air pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto. Atmospheric Emissions Licenses (AELs) related to site-specific emissions will be the responsibility of future third-party property owners/ developers. The applicant does not plan any activities that would need AELs.

Legislation	Authority	Relevance
		The Dust Control Regulations (2013) prescribe dust fallout rates for residential and non-residential areas. For activities where the dust fall standard is exceeded, a dust fall monitoring report must be compiled and submitted. An air quality assessment was undertaken to identify the anticipated impact of the Project on ambient air quality.
Climate Change Bill (2022)	DFFE	The Climate Change Bill was introduced to Parliament on 18 February 2022. Its stated objectives are the following: • Provide for a coordinated and integrated response by the economy and society to climate change and its impacts in accordance with the principles of cooperative governance; • Provide for the effective management of inevitable climate change impacts by enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic and environmental resilience and an adequate national adaptation response in the context of the global climate change response; • Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system; • To ensure a just transition towards a low carbon economy and society considering national circumstances; • Give effect to the Republic's international commitments and obligations in relation to climate change; and • Protect and preserve the planet for the benefit of present and future generations of humankind. South Africa, being a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) that ratified the Kyoto Protocol and further adopted the Paris Agreement, endorsed the need to mitigate the emission of GHG. Climate change regulation plays an important role in the promotion of a sustainable environment. The judgement in the High Court case of EarthLife Africa Johannesburg v Minister of Environmental Affairs and Others highlights the significance, place, and principles of climate change impact assessments. In terms of the definition of pollution in NEMA, the emission of GHG is regarded as a form of pollution, which must be assessed in any EIA.
National Environmental Management: Biodiversity (Act 10 of 2004) (NEM: BA)	DFFE	The Act provides for the management of all biodiversity within South Africa. The 2007 Threatened or Protected Species Regulations (GN R150, as amended) provide protection through a permit system as well as through the identification of restricted activities. If required, the relevant permits will be applied for. The Act also provides for duty of care with regard to the control of alien species and provides a listing of threatened or protected ecosystems and species in one of the following four categories:

Legislation	Authority	Relevance
		critically endangered (CR), endangered (EN), vulnerable (VN), protected (species only), and least threatened (LT). The NEM: BA Alien and Invasive Species Regulations (Government Notice No. R1020 of September 2020) categorises the different types of alien and invasive plant and animal species and how they should be managed: • Category 1a Listed Invasive Species – species that must be combatted or eradicated. • Category 1b Listed Invasive Species – species that must be controlled. • Category 2 Listed Invasive Species – species that require a permit and must not be allowed to spread outside of the designated area. • Category 3 Listed Invasive Species – species which are subject to exemptions in terms of the section requiring a permit, but where such a species occurs in riparian areas, must, for these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed accordingly.
NEM: BA National list of ecosystems that are threatened and in need of protection	DFFE	The revised national list of ecosystems that are threatened and in need of protection (GN No.2747 of 18 November 2022) informs the Threatened Ecosystems classified as CR or EN that have status as geographic areas in terms of Listing Notice 3 of the 2014 EIA Regulations, as amended. The Baseline Vegetation Assessment (9 June 2021) found that the grassland north of the N3 (within the proposed development footprint) is regarded as KZNSS. KZNSS grassland threat status is classified as Endangered (SANBI, 2022) at a National Level and Critically Endangered at a Provincial Level. However, in terms of published data available through SANBI BGIS, the proposed development footprint falls within the Vulnerable Ngongoni Veld ecosystem. Ngongoni Veld or Other Geology Grasslands (OGG) is listed as Vulnerable nationally and as Endangered provincially above the escarpment (Kloof Conservancy, n.d.). However, in terms of the more recent 2018 NBA and the 2018 VegMap dataset (SANBI, 2018), the proposed development footprint falls within an area classified as Dry Coast Hinterland Grassland (Vulnerable). Thus, in terms of the available datasets, the proposed development footprint does not fall within the KZNSS threatened ecosystem. The national web-based screening tool indicates that the proposed development footprint is located within a Vulnerable Threatened Ecosystem. Thus, according to current databases, the proposed development footprint does not fall within the legislated listed “critically endangered” and “endangered” ecosystems. However, through site verification completed by the Botanist (David Styles), it was confirmed that the site is located on KZNSS Grassland (which was formerly known as Ngongoni Grassland).
National Environmental Management: Waste Act (Act	EDTEA Durban Solid Waste	The Act aims to regulate waste management to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms

Legislation	Authority	Relevance
59 of 2008) (NEM: WA)		and standards for regulating the management of waste by all spheres of government; to provide for specific waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement, and to provide for matters connected therewith. Waste Management Licenses related to site-specific storage, handling or disposal of waste will be the responsibility of future third-party property owners/ developers and is excluded from this EIA process.
National Forests Act (84 of 1998) (NFA)	DFFE	The NFA prohibits the destruction of natural forests and allows for the declaration of trees as protected. Natural forests are defined as a group of indigenous trees- (a) whose crowns are largely contiguous; or (b) which have been declared by the Minister to be a natural forest under section 7(2). There are 55 protected tree taxa (species or sub-species) defined by GN 1935 of 2022 in terms of the NFA. These taxa may not be cut, destroyed, damaged or removed unless a permit has been granted by the DFFE. The Baseline Vegetation Assessment (9 June 2021) lists the protected trees identified in the PFS study area, including <i>Sclerocarya birrea</i> subsp. <i>caffra</i> (Marula) and <i>Sideroxylon inerme</i> (White Milkwood) in Eastern Valley Bushveld and an unusual occurrence of <i>Prunus africana</i> (African-almond or Red Stinkwood) in Scarp Forest (seen in 2013/2014). <i>Pittosporum viridiflorum</i> (Cheesewood) was not seen but is noted as likely to be present.
National Heritage Resources Act (25 of 1999) (NHRA)	South African Heritage Resource Agency (SAHRA) and Amafa aKwaZulu-Natali (Amafa)	In terms of the NHRA, any person who intends to undertake “any development ... which will change the character of a site exceeding 5,000 m² in extent” and/or “the construction of a road...powerline, or pipeline...exceeding 300 m in length” must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely SAHRA or the relevant provincial heritage agency. The relevant provincial heritage agency, Amafa, has indicated that a full Heritage Impact Assessment (HIA) that makes specific reference to visual impacts on the cultural landscape, archaeological impacts, and palaeontological impacts, is required. A Heritage Baseline and Sensitivity Report was undertaken as part of the PFS in March 2021. Several heritage sites were recorded, and mitigation measures have been recommended for these sites. An HIA has been completed and an application will be submitted to the heritage authorities
KwaZulu-Natal Amafa and Research Institute Act, 2018 (5 of 2018)	Amafa	The KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018) includes the following provisions relating to heritage resources: Section 37, which refers to the protection of structures that are or that may reasonably be expected to be older than 60 years;

Legislation	Authority	Relevance
		- Section 38, which refers to the protection of graves of victims of conflict; - Section 39, which refers to the protection of informal and private burial grounds; - Section 40, refers to the protection of battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites; and - Section 41, lists developments that may require a Heritage Impact Assessment (HIA). The KwaZulu-Natal Heritage Regulations, 2012 (Provincial Notice No. 40 of 2012) outline the permit application process in terms of the demolition, destruction, alteration, etc., of structures, graves and other heritage resources referred to above must be adhered to.
National Protected Areas Expansion Strategy (2008) (NPAES)	DFFE EKZNW SANBI	The NPAES for South Africa sets out targets for protected area expansion, identifies possible expansion areas and recommends a mechanism for protected area expansion. Protected areas in terms of the NEM: PAA is considered 'formal' protected areas in terms of the NPAES. The NPAES further identifies 'National Parks', 'informal protected areas' and 'focus areas'. The focus areas were identified through a systematic biodiversity planning process undertaken as part of the development of the NPAES 2008. These areas present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. EKZNW has developed a 20-year Protected Areas Expansion Plan to guide this process within the KZN Province (EKZNW, 2009a). It is assumed that this KZN Protected Areas Expansion Plan has been incorporated into the NPAES. Based on the results of the web-based national screening tool, all 3 study areas are affected by the proposed NPAES areas.
National Road Traffic Act (93 of 1996) (NRTA), as amended	KZN Department of Transport (DOT) South African National Roads Agency SOC Limited (SANRAL) eThekweni Transport Authority (ETA)	A traffic specialist was appointed to assess the traffic impact of the proposed development and provide input with regard to route planning and road upgrades. The specifications for road upgrades and internal roads to support the proposed land uses are described in Section 3.3. SANRAL, ETA and the KZN DOT have been consulted during the PFS and will be provided with an opportunity to comment on the environmental application and participate in key stakeholder meetings.
National Veld and Forest Fire Act (101 of 1998)	DFFE	The purpose of the Act is to prevent and combat veld, forest and mountain fires throughout South Africa. The Act applies to the open countryside beyond the urban limit and puts in place a range of requirements. The Act sets out the responsibilities of landowners or persons in control of the land which include: prepare firebreaks on their side of the boundary if there is a reasonable risk of veld fire;

Legislation	Authority	Relevance
		• have such equipment, protective clothing and trained personnel for extinguishing fires as prescribed (in the regulations); • if there are no regulations, reasonably required in the circumstances, take all reasonable steps to notify the FPO of the local FPA (if there is one) when a fire breaks out; and • do everything in their power to stop the spread of the fire.
National Water Act (36 of 1998) (NWA)	Department of Water and Sanitation (DWS)	Section 2 of the National Water Act, 1998 (Act No. 36 of 1998 (NWA) provides for the protection, use, development, conservation, and control of water resources while ensuring: • Promoting sustainable use of water; • Protection of aquatic and associated ecosystems and biological diversity; and • Reducing and preventing pollution and degradation of water resources. Sections 12 -20 of the NWA include provisions relating to the protection of water resources, including the water reserve and water quality. Section 13 relates to the establishment of water quality objectives, including: • The presence and concentration of particular substances in the water • The characteristics and quality of the water resource and the in-stream and riparian habitat • The characteristics and distribution of aquatic biota • The regulation and prohibition of in-stream and land-based activities which may affect the quantity and quality of the water resources Section 19 of the NWA provides for pollution prevention and requires that a person who owns, controls, occupies or uses the land in question, is responsible for taking reasonable measures to prevent the pollution of water resources. A catchment management agency may take action to prevent or remedy the pollution and recover all reasonable costs from the responsible party. The 'reasonable measures' which have to be taken may include measures to: • Cease, modify or control any act or process causing the pollution; • Comply with any prescribed waste standard or management practice; • Contain or prevent the movement of pollutants; • Eliminate any source of pollution; • Remedy the effects of pollution; and • Remedy the effect of any disturbance to the bed and banks of a watercourse". "Pollution may be deemed to occur when the following are affected:

Legislation	Authority	Relevance
		- the quality, pattern, timing, water level and assurance of instream flow; - the water quality, including the physical, chemical and biological characteristics of the water; - the character and condition of the in-stream and riparian habitat; - the characteristics, condition and distribution of the aquatic biota". Section 21 of the NWA recognises and defines water uses that require the approval of DWS in the form of a General Authorisation (GA) or Water Use Licence. There are restrictions on the extent and scale of identified activities, determined through a risk assessment, for which General Authorisations apply. Given that the Project is at a high-level planning phase and the erf-specific development plans and infrastructure designs are not available at this stage, a WULA is being undertaken in parallel with the EIA. Erf-specific WULAs and wetland offset processes would need to be initiated by prospective developers / future landowners.
Spatial Planning and Land Use Management Act (16 of 2013) (SPLUMA)	eThekweni Land Use Management	The SPLUMA provides a framework for inclusive, developmental, equitable and efficient spatial planning in the different spheres of Government. The SPLUMA allows for the "promotion of greater consistency and uniformity in the application procedures and decision-making by authorities responsible for land use decisions and development applications". The SPLUMA is meant to address racially based pre-1994 planning legislations, as well as to repeal most of them. SPLUMA provides for: - - A framework for a Planning System for the country (Sec2 [2]); - Development Principles (Sec 7); - Policies and legislation (Sec 6); - SDFs (Chapter 4); - Land Use Management through Schemes (Chapter 5); - Land Development Management (Chapter 6); and - Other provisions (Chapter 7). The development principles contained in SPLUMA guide the manner in which the EM approached development in the Outer West Local Area Plan (LAP) and inform the development principles for the proposed and use options project.
Subdivision of Agricultural Land Act (70 of 1970) (SALA)	KZN Department of Agriculture and Rural Development (DARD)	The purpose of this Act is to control the subdivision and, in connection therewith, the use of agricultural land. Applications should be made to KZN DARD to allow for long-term leases, the subdivision or rezoning of agricultural land, as well as other prohibited actions in terms of the Act. An application will be submitted to DARD for authorisation following the conclusion of the

Legislation	Authority	Relevance
		EIA process. DARD has been included in the EIA process to obtain preliminary consent as part of the process.
Restitution of Land Rights (Act 22 of 1994)	Commission on Restitution of Land Rights	The Restitution of Land Rights Act (Act 22 of 1994) provides a legal framework for the restitution of land to people who were forcibly removed from their land or dispossessed of it under previous discriminatory laws or practices. The Act allows for claims to be made by individuals, communities, or families who were dispossessed of their land after 19 June 1913. It establishes a Commission on Restitution of Land Rights to investigate and assess claims, and to recommend the restoration of land or alternative forms of compensation. The Act was amended in 2014 to extend the deadline for lodging claims to 30 June 2019 and to provide for the appointment of a Chief Land Claims Commissioner to oversee the process of restitution. The amendment also provides for the reopening of the lodgement period for certain claims that were previously rejected, as well as the introduction of a special dispensation for farm dwellers and labour tenants. The commission was approached to check if there are any land claims in the Cato Ridge study area. The Commission confirmed that there are no land claims on the affected properties.

2.3.2 Relevant Policies

An overview of the relevant policies is provided in **Table 9** below.

Table 9: Relevant policies and the applicability thereof

Policy	Authority	Relevance
National Development Plan 2030 (NDP) 2011	EM	In 2012/2013, the South African Government adopted the NDP as its launchpad and blueprint for a future economic and socioeconomic development strategy for the country (Trade Law Centre, 2013). The NDP 2030 highlights the need for decoupling the economy from natural resource consumption and carbon emissions. The NDP points toward the maintenance of ecosystem services as fundamental to achieving South Africa's social and economic development objectives and presents 3 measures to protect the country's natural resources: An environmental management framework. Developments that have serious environmental or social effects need to be offset by support for improvements in related areas; A target for the amount of land and oceans under protection (presently about 7.9 million ha of land, 848km of coastline and 4 172km² of the ocean are protected); and A set of indicators for natural resources, accompanied by the publication of annual reports on the health of identified resources to inform policy. South Africa has initiated Operation Phakisa, which is one of the mechanisms put in place to implement the NDP. Operation Phakisa is a fast results delivery launched in July 2014, with the ultimate goal of boosting economic growth and creating jobs. Current Operation Phakisa priority projects focus on the ocean economy, health, education, mining, biodiversity economy, agriculture, land reform and rural development, and the chemical and waste economy. The objective of the Project is to enable a conducive environment for economic opportunities that will result in further job creation and thus lead to more sustainable livelihoods, which is considered to be in line with the NDP objectives.
New Urban Agenda (20 October 2016)	EM	The New Urban Agenda was adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) on 20 October 2016. The New Urban Agenda contributes to the implementation and localization of the 2030 Agenda for Sustainable Development in an integrated manner and the achievement of the Sustainable Development Goals (SDGs) and targets. The most relevant is SDG 11, which aims to "make cities and human settlements inclusive, safe, resilient and sustainable."
2030 Agenda for Sustainable Development	DFFE	The UN 2030 Agenda for Sustainable Development resulted in 17 Sustainable Development Goals (SDGs) with 169 associated targets. The goals came into effect on 1 January 2016. The agenda recognizes that social and economic development depends on the sustainable management of our planet's natural resources, and as such the signatories are determined to conserve and sustainably use oceans and seas, freshwater resources, as well as forests, mountains and drylands and protect biodiversity, ecosystems and wildlife (United Nations Department of Economic and Social Affairs, 2015).
2020 National Ecosystem Biodiversity Targets	SANBI, DFFE	The protection levels of the terrestrial ecosystems that were identified in the revised national list of ecosystems that are threatened and in need of protection (GN No.2747 of 18 November 2022) as Critically Endangered or Endangered and also unprotected or poorly protected should be substantially increased. No further loss should take place in Critically Endangered Ecosystems. Given that the vegetation in the study area has been characterised as KZNSS, gazetted as Endangered by GN 2747 of 2022, further loss of KZNSS

Policy	Authority	Relevance
		should be avoided. This points to the need for offsets should the Project be authorised.
National Spatial Development Framework (NSDF) 2019	Department of Rural Development and Land Reform (DRDLR) Department of Planning, Monitoring and Evaluation	To ensure alignment with the NSDF, any proposed spatial interventions must yield and stimulate the desired national spatial development patterns in the future, and consequently, the desired national spatial outcome premised on the 5 themes. Any development that occurs in and around Cato Ridge should specifically focus on those areas with the potential to achieve the NSDF objectives. The eThekweni area, including the Cato Ridge area, with the support of the N3, has been highlighted as a critical social and economic development priority area.
Integrated Urban Development Framework (IUDF) (June 2016)	Department of Co-operative Governance and Traditional Affairs (COGTA)	The IUDF is a policy initiative of the government coordinated by the Department of Co-operative Governance and Traditional Affairs (COGTA). It sets a policy framework to guide the development of inclusive, resilient, and liveable urban settlements while addressing the unique concept and challenges facing SA cities. It advocates the effective management of urbanisation so that the increasing concentration of an economically active population translates into higher levels of economic activity, greater productivity and higher rates of growth, thereby transforming our cities into engines of growth. To ensure alignment with the IUDF, the EM needs to ensure that effect is given to the national spatial vision in a manner that is locally relevant. Urbanisation must be effectively managed to ensure that the increasing concentration of people translates into higher levels of economic activity, greater productivity and higher rates of growth. Furthermore, spatial integration, social inclusion and access, inclusive, sustainable economic growth and development and good governance should be at the forefront of all development strategies and interventions. The development of Cato Ridge must give effect to the national spatial vision contained in the IUDF.
National Infrastructure Plan (NIP): Strategic Integrated Projects (SIPS) 2012	Presidential Infrastructure and Coordinating Commission (PICC)	The NIP was adopted in 2012 and the PICC was established to integrate and oversee its implementation. The PICC announced 18 SIPs which represent corridors of proposed infrastructural development, as support to achieving the goals of the NIP. The SIPS provide an integrated framework for the delivery and implementation of social and economic infrastructure across the face of South Africa. Some of the SIPS include catalytic projects that can be used to fast-track growth, address unemployment and reduce poverty and inequality.
Note that the draft NIP 2050 has been published (10 August 2021) and will likely supersede NIP 2012.		One of the geographically focussed SIPs relevant to the Municipality is the SIP 2: Durban-Free State-Gauteng logistics and industrial corridor centred along the N3. SIP2 is aimed at: • Strengthening the logistics and transport corridor between SA's main industrial hubs; • Improving access to Durban's export and import facilities; • Integrating Free State Industrial Strategy activities into the corridor; • New port in Durban; and Aerotropolis around OR Tambo International Airport.
N3 Corridor Development Study (SIP2) plan (2016)	PICC COGTA	The N3 Corridor Development Study (SIP2) plan anticipates demand for Industrial land to be 2,236ha, of which 908ha will be for manufacturing and 1,328ha for warehousing in the KZN Industrial and Logistics Hub (Pinetown to Hilton) by 2045 (COGTA, 2016). The PICC has been approached for comment in this regard.
KZN 2035 Provincial Growth and Development Strategy (PGDS)	Provincial Planning Commission	The PGDS is the primary growth and development strategy for KwaZulu-Natal to 2030 and mobilises and synchronises strategic plans and investment priorities in all spheres of government, state-owned entities, business, higher education institutions, labour, civil society and all other social partners to achieve the desired growth and development goals, objectives and outcomes. The PGDS spatially contextualises and prioritises

Policy	Authority	Relevance
		interventions in the province to achieve greater spatial equity. Clearly defined institutional arrangements are developed to ensure decisive leadership, robust management, thorough implementation and ongoing review of the growth and development plan. The PGDS outlines 7 strategic goals relating to growth and development in the province, including: Strategic Goal 1: Inclusive Economic Growth; Strategic Goal 2: Human Resource Development; Strategic Goal 3: Human and Community Development; Strategic Goal 4: Strategic Infrastructure; Strategic Goal 5: Environmental Sustainability; Strategic Goal 6: Governance and Policy; and Strategic Goal 7: Spatial Equity. Concerning industrial-type developments, the PGDS highlights the need for linkage and spatial integration of the Special Economic Zones (SEZs) and regional industrial hubs and the slow delivery of appropriately serviced and zoned land for industrial development outside SEZs.
eThekwini Municipality IDP – 5-year plan- 2017/18 to 2021/22 (2021/2022 Review) 27 May 2021	EM Development Planning	In the 2020/2021 IDP (5-year plan), the Municipality highlights the role of industrial development and catalytic projects in improving the rates base. The IDP describes the Cato Ridge area as part of the Prime Investment Corridor (greenfield), which is a narrow spatial target for strategic investment, within the Urban Zone, in response to the N3 freight corridor from the Port. The Prime Investment Corridor aims at a greater intensity of land uses, and a greater density of jobs, trips, residents, and investment. The Cato Ridge Freight and Logistics project is listed as one of the Municipal catalytic projects, with an investment value of R18 billion and annual revenue of R300 million. eThekwini is contributing R2.5 billion, including SANRAL and KZN DOT roads, while the developer contribution is R15.5 billion (eThekwini Municipality, 2021). The project is anticipated to create 10 000 jobs throughout all phases and is scheduled to be developed between 2021-2026. Investors for the Cato Ridge Freight and Logistics project are listed as CRLHC, which includes Lord Trust Development, AmaXimba Development Trust, and Inkanyezi Yezulu. [Notably, the IDP lists a separate catalytic project, the “Cato Ridge Multi-Modal Development”, which is in the planning phase and is valued at R11 billion, with a projected annual turnover of R120 million and the creation of 10 000 jobs (eThekwini Municipality, 2021). This is assumed to be linked to the Cato Ridge Freight and Logistics project as no further details are given.] The IDP highlights the need to provide a full waterborne sanitation system to the Cato Ridge area to unlock the development potential in this node. The eThekwini Water and Sanitation Department has proposed a new Cato Ridge Sterkspruit River Sewer Outfall with diameters ranging from 300 mm to 1050 mm that will collect and convey the wastewater generated from the Cato Ridge and Harrison Flats areas to the proposed upgraded Hammarsdale WWTW. It is reported that, due to the environmental, Water Use License Application (WULA) and wayleave constraints, a longer than normal lead time is anticipated to adequately address them.
eThekwini SEA Phase 1 (PDA 2) Report September 2020	eThekwini Biodiversity Management Department (BMD)	Phase 1 (PDA 2) of the eThekwini SEA was completed in September 2020 and includes an environmental status quo analysis for the Municipality. The Report cites Cato Ridge as an example where transport-related development intersects with the highest conservation value grassland in the Municipality. The protection of remnant KZNSS grassland in Cato Ridge is flagged as a priority for BMD. Threats to these grasslands include the direct threat from land uses and the associated threat from the additional development attracted by industry (e.g., increased infrastructure and population. Cato Ridge is also highlighted as a watershed where large-scale transformation

Policy	Authority	Relevance
eThekwini Draft Municipal Spatial Development Framework (MSDF) 2022-2023 (Feb 2022)	EM Development Planning	would reduce the capacity of the catchment to regulate run-off and store water. The BMD are still in the process of scoping Phase 2 (PDA 3) of the SEA (J. Douws, <i>pers comm</i>).
		The vision for the EM is “By 2030, eThekwini will be a socially equitable, environmentally sustainable, resilient and functionally efficient Municipality that bolsters its status as a gateway to Africa and the world”. In terms of the MSDF, Cato Ridge (Industrial) is listed as an Industrial Node. The greater Cato Ridge Local Area is reported as having large tracts of undeveloped industrial zoned land that has been mooted as part of a major metropolitan industrial growth node. The Outer West planning region within which The Project is located is considered to be an Environmental Management Priority Area, to provide opportunities for strategic Industrial Expansion and related employment opportunities, and to have the potential for tourism-related opportunities. The eThekwini Municipality SDF identifies Cato Ridge as a major focus for industrial expansion of Local, Provincial and National significance. The MSDF highlights the need for an upgrade of the Hammarisdale WWTW located in the Hammarisdale Industrial Area, which has a design (hydraulic) capacity of 27 Ml/day. The very high-strength industrial effluent received has resulted in the processing capacity of the plant being de-rated to approximately 10 Ml/day. The plan is to build new reactors to allow the plant to have a processing capacity of 27 Ml/day, based on the current high-strength influent characteristics. The MSDF also notes that to unlock the development potential in this node and plan accordingly, the city will need to provide a full waterborne sanitation system to the area. In response to this, EWS has plans to construct a new Cato Ridge Sterkspruit River Sewer Outfall with diameters ranging from 300 mm to 1050 mm that will collect and convey the wastewater generated from the Cato Ridge and Harrison Flats areas to the proposed upgraded Hammarisdale WWTW. Due to the environmental, WUL application and wayleave constraints, a longer than normal lead time is anticipated to adequately address them. The Cato Ridge area has been identified as one of the industrial expansion and potential dry port areas in the Municipality that can respond to the increasing demand for industrial land in eThekwini Municipality and provide logistics support for the port. However, the area is reportedly facing significant challenges with regard to traffic issues (limited accessibility). It is anticipated that by improving the infrastructure, upgrading the N3 and addressing the sewer issue the area can be unlocked for the development of light industry, warehousing, distribution and logistics precinct. The development of Cato Ridge is regarded as a stimulus to unlocking the potential of the surrounding areas of Mpumalanga and Hammarisdale. Cato Ridge is listed as one of the eThekwini MSDF catalytic projects as well as a Key Priority Investment Area (Urban). The Cato Ridge SDF map indicates medium impact industry along Eddie Hagan Drive with the landfill site to the north. The landfill was investigated as a regional landfill location alternative for the Municipality; however, the EIA was not approved. The 2022/2023 MSDF (eThekwini Municipality, 2022) notes that land distribution and development in the Cato Ridge area will need to be sensitive to the Mkhambathini Local Municipality plans and proposals, given that their focus is on agriculture, tourism and biodiversity. There is a cautionary note regarding the possible impact on the Mayibuye Game Reserve, a project of the Mkhambathini Local Municipality. Buildings that may have a negative visual impact should be limited and “proposed” developments along the north-western boundary of Cato Ridge should be monitored. The 2022/2023 SDF notes that, with regards to the Cato Ridge Logistics Hub, the following developments have taken place: The feasibility study has been completed.

Policy	Authority	Relevance
		Heads of Agreement reached with Engen on the development, maintenance and operation of the Truck Stop and Staging facility. First offtake agreement secured for transportation of timber via rail shuttle to Durban Port. The Conceptual Design of KwaXimba Interchange has been supported by the Transport Authorities.
Outer West Sub Scheme (5 August 2021)	EM Development Planning BMD	According to the Outer West sub-scheme (eThekweni Municipality, 2021), without the prior written approval of the Municipality, no person shall within a Durban Metropolitan Open Space System Controlled Area: a) develop, excavate or level any erf; or b) remove any natural vegetation from any erf; or c) erect any structure of any nature whatsoever on any erf; or d) dump on or in any erf; or e) permit any domesticated animals to cause harm to flora and fauna or the environment generally; or f) carry out any work or undertake any activity upon any erf which may compromise the intention of DMOSS as stated in the definition. No such approval shall be given unless, after due examination by the Municipality and subject to such conditions as may be specified by the Deputy Head: BMD. Much of the Cato Ridge area falls within the DMOSS. The open space system includes a variety of aquatic and terrestrial habitats and ecosystems which provide a range of ecological goods and services.
eThekweni Industrial Spatial Strategy (2009)	EM Development Planning	The eThekweni Industrial Spatial Strategy (2009) serves as an overarching, city-wide, approach to industrial development and seeks to guide industrial development within the eThekweni Metro. It does so by identifying sectors with growth potential, outlining their spatial and infrastructural needs, and identifying available space and the appropriateness of these locations to unlock and maximise economic returns. The strategy goes further by providing motivations for external investment and the growth of existing industries and provides a set of actions toward the implementation of the strategy. Importantly, the strategy aims to guide the planning and spatial development of eThekweni, as well as to identify necessary interventions by the local government. The Industrial development strategy is used as a guide in assessing industrial-type development applications. The following challenges were highlighted in the Industrial Spatial Strategy: • Existing available land is poorly serviced; • Existing rail linkages are not optimised; • Existing industrial areas have little/no room for expansion and are costly; • Uncertainty relating to the future of the port expansion options; and • Aggressive industrial strategies are being adopted by adjacent municipalities. The Report assessed 3 scenarios relating to Port Expansion: incremental changes, limited port expansion and maximum port expansion.
eThekweni Industrial Land Strategy (2014)	EM Development Planning	The growth of the Durban Port, and its effect on the local industrial and logistics-based land market, can be quantified using growth projects for Container Movements (TEUs - Ten-foot equivalent Units) through the Durban Container Terminal. According to eThekweni's Industrial Land Strategy, Transnet projected that by 2011, 2.9 m TEUs would move through the Port of Durban. By 2014 this was projected at 4.9 m TEUs thus requiring an additional 1704ha "back-of-port" land required to support the growth of containers. By 2037, once the Dig-Out Port was complete, 9.6 m TEUs would be accommodated, and an additional 335 ha of land would be required. This is based on the 35-ha required for every 1 m TEU, of which 20% of every ha of container handling area is required to store empties. However, in 2015, due to a global economic downturn, the TEU volume moving through the Port was 2.6 m.

Policy	Authority	Relevance
Integrated Freight and Logistics Strategic Framework and Action Plan (2017)	EM	Refer to Section 5 (Need and Desirability) for the role of the Cato Ridge siding with the updated Port of Durban expansion plans. The proposed dry port at Cato Ridge is anticipated to address the challenge of road congestion by trucks collecting cargo from the port. The dry port will handle container and bulk cargo. Cargo will be transferred from the port via rail line to trucks that will pick it up at Cato Ridge. There are also plans to develop the Cato Ridge logistics Hub which will include mega truck stop facilities, containers and car terminals, a tank farm, and industrial and commercial development. The Project is considered to be a catalyst and is expected to create employment opportunities. The Cato Ridge Intermodal Hub Implementation project is being undertaken by the CRLHC⁵, Transnet, SANRAL, and eThekweni (initiated in 2019/20). Refer to Section 5 (Need and Desirability) for the role of the Cato Ridge siding with the updated Port of Durban expansion plans.
eThekweni Industrial Land Study and Land Strategy Development (2014)	EM Development Planning	The EM Economic Development and Investment Promotion Unit appointed the Planning Initiative Team in 2013 to prepare an Industrial Land Study and Industrial Land Development Strategy for the Metro. The eThekweni Industrial Land Study and Land Strategy Development (2014) is an extension of the eThekweni Industrial Spatial Strategy (2009). Given the focus on industrial development in Cato Ridge, the strategy proposes Cato Ridge as a priority for greenfield development. An opportunity exists for industrial development due to the significant amount of flat land and the location of the area on the road and rail route between Durban and Pietermaritzburg (and ultimately Gauteng, which is already being demonstrated through the recent growth in the area). It was noted, however, that the feasibility of the Cato Ridge dry port presents concerns given its proximity to the seaport and whether there would be an advantage for logistics related to the seaport. The report advised that the priority should be given to releasing land around King Shaka International Airport followed by Cato Ridge and then the south dry port area (the old Durban Airport). Refer to Section 5 (Need and Desirability) for the role of the Cato Ridge siding with the updated Port of Durban expansion plans.
eThekweni Rural Development Strategy (2016) (RDS)	EM Development Planning	The purpose of RDS (2016), amongst other things, is to provide an accepted definition of eThekweni rural area and develop an overall vision for rural areas. The overall vision then informs the role of rural areas and outlines an appropriate response to the vision by different stakeholders. The strategy defines and unpacks the character and challenges of rural areas within the eThekweni region and assesses the successes and failures of the previous strategies. The RDS further outlines a rural framework that is aligned with the city's vision and puts forward strategies which promote sustainable economic development, protection of the environment, food security and sustainable settlement patterns. When compared to the EM UDL (accessed 7 September 2021), the proposed development footprint falls largely within the UDL of the Municipality. Thus, the RDS would only apply to the parts of the 3 development areas outside the UDL.
Outer West Spatial Development Plan (OWSDP 2013-2014)	EM Development Planning	The fourth OWSDP was adopted by Council in March 2014 and builds on the need to address current challenges and unpack the long-term strategic policy by translating it into a more detailed framework in terms of residential, transport, investment and environmental interventions. The purpose of the OWSDP is to promote and guide development in the Outer West to respond sustainably to the various needs and challenges facing the Municipality. Key objectives include:

⁵ Please note the CRLHC and their proposal for the Cato Ridge Logistics Hub should not be confused with the current Application by the CRDC for a light industry, warehousing, distribution, and logistics precinct.

Policy	Authority	Relevance
		Establishing the N3/M13 corridor as the main economic movement system linking the Outer West to other economic centres, as well as supporting key strategic economic development; Protecting and managing the natural assets of the Outer West is very important and is evidenced by the fact that DMOSS covers almost 50% of the area; Establishing the Urban Development Line to delineate the outer limits where urban development will be permitted in accordance with infrastructure provision and capacity. The urban development line applies to the Western Suburbs and the Cato Ridge/Mpumalanga areas. Due to historical policies, certain parts of the Outer West such as Hammarsdale and Mpumalanga are more developed in terms of infrastructure services than other areas. The proposed urban development line in this context, therefore, applies to the east and west of the region with agriculture concentrated in the centre; and Organising the Outer West region into six local areas, namely Western Suburbs, Shongweni, Cato Ridge, Inanda Dam, Mpumalanga and Zwelibomvu to support a range of lifestyles and develop the assets and attributes of each local area. Eddie Hagan Drive is regarded in the OWSDP as supporting an Industrial Corridor.
Outer West Corridor Conceptual Spatial Framework (CSF)	EM Development Planning	The Outer West Corridor CSF informs the LAP and Precinct Plans in terms of location, extent and type of land uses, a hierarchy of movement corridors, open space systems, etc. The CSF suggests the location of major general industrial areas in the Harrison Flats area extending ultimately to areas south of the N3. The Report suggests that the growth of Cato Ridge Village is supported by the economic growth of Cato Ridge. The CSF suggests the maintenance of the existing agricultural usage, with emphasis on upgrading the surrounding rural development and integrating major open space corridors.
Outer West Development Corridor Study & Cato Ridge LAP (2012)	eThekweni Municipality: Development Planning	The 2012 Outer West Development Corridor Study & Cato Ridge LAP highlights the concept of Cato Ridge and Harrison Flats as rail-served inland container terminals (ICT), which has been stimulated through Transnet's port expansion plans and the anticipated pressures in the port area and the South Durban Basin (SDB). The suitability of establishing an ICT at Cato Ridge is elaborated on further in the report. The Report outlines various precinct plans, including the Cato Ridge Industrial Precinct Plan and Land Use Management Scheme. This is distinct from the Cato Ridge Village Precinct, which is primarily a residential area and business centre. One of the objectives of the study is to identify the strategic actions necessary to unlock industrial development and town centre development in Cato Ridge. Refer to Section 5 (Need and Desirability) for the role of the Cato Ridge siding with the updated Port of Durban expansion plans. Constraints to further development include the limited areas of flat land, the need for improved N3 access, WWTW constraints, historical & existing levels of pollution, and lack of skills amongst members of the local communities. Previous development proposals for the area include: Regional landfill site, due to the demand for a future regional landfill site in the Harrison Flats area; Eskom switching station and substation; Regional airport; and Inland intermodal container terminal. The Report notes that the proposed inland intermodal hub is of national strategic importance in achieving sustainable economic growth and job creation. There are no alternative sites for this inland intermodal hub at other locations within eThekweni Municipality along the east-west corridor due to topographical constraints.

Policy	Authority	Relevance
		Analysis of the feasibility of such an inland intermodal hub found the following key critical success factors: • All major logistic companies should relocate to Cato Ridge; • An east-west dedicated truck route should be constructed; • A new efficiently operated rail line is required; • The inland inter-modal terminal and rail service should be operated by a single business entity; • Containers being railed from Cato Ridge should be given extended stack dates; and • The export and import industry should be established around the inland intermodal terminal. The report also highlights the need for an additional N3 interchange to provide a direct linkage to Eddie Hagan Drive in the north, providing access to the Cato Ridge Industrial node. as well as creating potential direct access to future developments south of the N3. The Report suggests the screening of industrial development proposals against the following criteria: • Whether effluent from the land will drain to the north or south (i.e. into the Umgeni catchment, which is considered a major water source of the municipality); • Whether effluent would require pumping into the southern catchments; • Proximity to existing zoned land; • Access via existing road infrastructure; and • Level of environmental sensitivity. The Report proposes appropriately designed and managed tourism accommodation and facilities along the northern edge of the Harrison Flats plateau, with public viewing spaces along the edge of the Valley of Thousand Hills. The development is proposed to be separated from the industrial development by public open space areas. Eddie Hagan Drive is regarded as a significant tourism route, and it is recommended that a landscape buffer be established on both sides of the road to screen industrial development.
Cato Ridge Local Area Plan (LAP) Review (2018)	EM: Development Planning	The 2018 Cato Ridge LAP (eThekweni Municipality, 2018) is an update to the original 2012 Cato Ridge LAP. The Cato Ridge LAP addresses a much larger study area, 250% larger than the 2012 LAP, and included the rural and peri-urban areas of KwaXimba, Shangase and Fredville to the north of the original study area. In addition, the 2018 LAP includes consideration of the N3 Corridor Development Study for the Durban - Free State - Gauteng Logistics and Industrial Corridor (SIP2). The 2018 review of the 2012 Cato Ridge LAP included Functional Area Plans and the development of a Draft Scheme, and was aimed at incorporating the following policies: N3 Corridor Development Study for the Durban - Free State - Gauteng Logistics and Industrial Corridor (SIP2); eThekweni Freight and Logistics Strategy; and Refinements to the DMOSS. It is noted that all remaining representative patches of primary KZNSS (above 450 mamsl) and NV (below 450 mamsl) should be protected from irreversible transformation. The BMD identified several intermediate and good-condition KZNSS and NV grasslands to the north and south of the N3 to be retained as environmental protection areas. The Report notes that the spatial structure of eThekweni is changing, with a shift from the CBD, the Port and related SDB and the Pinetown New Germany hubs, to new key strategic zones/hubs on the outskirts of the traditional municipal boundary. These peripheral strategic zones/ hubs are regarded as major drivers and locations of economic growth and employment creation, with an important role in the logistics platform of eThekweni and the national logistics platform for South Africa. The Report notes that the eThekweni Municipality, through the issuing of the Cato Ridge LAP Review, Functional Area Plans and Draft Scheme Project,

Policy	Authority	Relevance
		recognised that significant change and development pressure had, and would continue to occur in and around the study area and that the existing (2012) LAP spatial plans and policies in place were not achieving the desired spatial pattern, development principles and economic growth originally anticipated. The land owned by Assmang that falls south of the N3 primarily falls within the Cato Ridge Village functional area, and the Harrison functional area as well as the areas to be protected as ecological assets. The Cato Ridge LAP earmarks the following land use activities for the Cato Ridge Village functional area: • Redefine Cato Ridge village as a mixed-use business, services and transport node serving the surrounding industrial zones; • Provide for informal trading activities to be accommodated within the node; • Provide for the long-term mixed-use/higher-density residential expansion of Cato Ridge south of the existing village; • Consolidate existing industrial development north of Phase 1 (PDA 2), Phase 2 (PDA 3) and Phase 3 (PDA 1) (R103 from Cato Ridge to Monteseel) and restrict new development in terms of environmental and infrastructure limitations; and • Protect and consolidate remaining agricultural activities on the P385 (Uitkomst Street/ Mr385) to preserve the integrity of the adjacent Mkhambathini agricultural production area. The Cato Ridge LAP earmarks the following land use activities for the Harrison functional area: • Consolidate and revitalise Harrison Flats as a metropolitan node for mixed medium impact manufacturing industrial node where new industrial, logistic, warehouse & distribution facilities are activities permitted; • Encourage clustering within the functional areas i.e. food and beverages in the vicinity of the Abattoir, metal products around the CRW and the SAFAL steel complexes, chemicals and building materials along with the Phase 1 (PDA 2), Phase 2 (PDA 3) and Phase 3 (PDA 1) corridor and recycling activities around the proposed landfill site (EIA Application for the landfill was not approved); • No new heavy (polluting) manufacturing activities are to be permitted; • Establish a mixed-use urban neighbourhood activity node at the intersection of Eddie Hagan Drive and the MR423 which serves the local industrial precinct; • Provide for informal trading activities to be accommodated within the nodes; • Upgrade and consolidate existing rural/traditional settlements in the Functional Areas; • Cluster residential development near major access intersections and places with good road access to facilitate the provision of an efficient public transport system; • Limit densities for rural housing to be no greater than 3du/ha; and • Identify and demarcate communal grazing lands. Based on this Harrison Land Use Activity Framework, the sites north of the N3 are earmarked for medium-impact industry, however, there is a significant presence of environmentally sensitive land identified through DMOSS. Furthermore, based on the plan, the land has been identified as a potential landfill to the north of the CRW smelter and west of Eddie Hagan Drive. This implies that a mixed-use development in the area is supported by the LAP, however, the DMOSS should be taken into consideration when proposing the mixed land uses. Within the LAP some strategic-level trade-offs were also identified that recognised the need to balance conservation and development aspirations. The botanical specialist has noted that the Cato Ridge LAP is contradictory in that parts of the proposed development footprint are indicated as a Light

Policy	Authority	Relevance
		Industry: Medium-Impact zone even though much of the vegetation comprises KZNSS. With regards to development guidelines, the report notes that: - Any development must be set back at least 25 m from the edge of the grassland. - French Drains must not be located within 25 m of the edge of grasslands. - A minimum buffer of 20 m is required between the footprint of development and the top of the bank of a stream or drainage line; and - No development within 1:100-year floodlines. - These guidelines will form part of the Environmental Management Programme (EMPr) in the EIA Phase.
Transnet Port of Durban Hub Development Strategy (2032)	Transnet Freight Rail, Transnet SOC Ltd	In a presentation to the Select Committee on Public Enterprises and Communication on 2 June 2021 (Transnet SOC Ltd, 2021), Transnet unveiled its plans for the expansion of capacity at Port of Durban, in line with a 2032 Desired End State. Currently, the Port of Durban attracts 60% of the trade to South Africa. The proposed master plan for the development of the Port of Durban Hub will see an increase in capacity from 2.9 million TEUs to 11.3 million TEUs by 2032. The strategy aims to reduce the costs of intercontinental shipping through partnerships and to create integrated port-hub systems to improve the attractiveness and capacity of the Port. The Port of Durban is regarded as the key to unlocking the African Continental Free Trade Area and improving trade in the SADC region. As global shipping trends have seen an increase in the size of container ships, there is a need for deep water berths and an increase in the capacity of the container terminal from 2.7 million TEUs to 7.6 million TEUs (Transnet SOC Ltd, 2021). The development of the NatCor (Natal Corridor/ Durban to Gauteng corridor) is seen as integral to the Port of Durban expansion strategy. Cato Ridge siding is positioned along the NatCor mainline and has been designated as a CatCon or container loading and offloading facility, in line with the Transnet commodity segment strategies (Transnet SOC Ltd, 2021). Thus, the Cato Ridge siding is regarded as an integral Back of Port facility to support the Port of Durban expansion plans. The critical path capacity enabler is the provision of 8 trains per day at the Cato Ridge siding. The rail infrastructure at Cato Ridge exists and recently the lease for the Transnet Freight Rail siding has been placed in the open market (advertised on 29 April 2021, and closed on 31 May 2021). A “hook and rail” service would be offered. It is envisaged that Cato Ridge would handle 6 containers and 3 automotive per day, as an off-dock facility (Transnet SOC Ltd, 2021).

3 ENVIRONMENTAL ASPECTS

3.1 IMPACTS ASSESSED AS PART OF THE EIA

During the EIA, the various specialists identified a number of impacts to be assessed and proposed mitigatory measures to manage the various potential impacts. The outcome, and intent, of the impact management recommendations i.e., mitigation measures, is to reduce the level of an impact on the environment to acceptable levels. The preferred method would be to avoid impacts; however, this is not always possible.

The various identified impacts were assessed as part of the EIA and were assigned an anticipated impact rating (significance) for both pre-and post-mitigation. The significance ratings are summarised according to environmental impact and project phase in the following tables.

The following tables provide a summary of the pre-and post-mitigation impact and risk significance ratings. Significance ratings are ranked from Major (+) through to Major (-) in the tables and are identified in accordance with the following legend.

Legend:

	Moderate (+)	Minor (+)	Negligible (+)	Neutral	Negligible (-)	Minor (-)	Moderate (-)	
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Table 10: Summary of the Construction phase impacts.

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Hydropedology	Earthworks: site preparation, including placement of contractor laydown areas and storage (i.e., temporary stockpiles, bunded areas etc.) facilities.	Negligible (-)	Neutral
Hydropedology	Earthworks: Disturbing vadose zone during soil excavations/infilling activities.	Negligible (-)	Neutral
Hydropedology	Earthworks: Vegetation clearing & soil stockpiling.	Negligible (-)	Neutral
Hydropedology	Earthworks: Seepage/leakages/overland flow from the sewer lines may cause soil degradation. Moreover, oil & fuel spills from vehicles parked at the site may compromise soil quality. Prolonged pollution may migrate to the nearby watercourse and/or percolate into the groundwater table.	Negligible (-)	Neutral
Hydropedology	Earthworks: Surface water contamination and sedimentation	Negligible (-)	Neutral
Hydropedology	Earthworks: Temporary dewatering of perched groundwater (only expected during intense storm events and shortly thereafter).	Negligible (-)	Neutral
Hydrology	Alteration of hydrological and geomorphological processes (erosion and sediment).	Minor (-)	Minor (-)
Hydrology	Increase in Surface Runoff	Moderate (-)	Minor (-)
Hydrology	Impacts on water quality.	Moderate (-)	Minor (-)
Aquatic and wetlands	Direct physical loss or modification of wetland and/ or aquatic habitat associated with the onsite watercourses	Minor (-)	Negligible (-)
Aquatic and wetlands	Alteration of hydrological and geomorphological processes (erosion and sediment)	Minor (-)	Minor (-)
Aquatic and wetlands	Impacts on water quality	Minor (-)	Negligible (-)
Aquatic and wetlands	Impacts on ecological connectivity and/or ecological disturbance impacts.	Minor (-)	Negligible (-)
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Fauna	Loss of habitat and associated fauna		Moderate (-)
Fauna	Impacts on aquatic ecosystems: hydrology and water quality	Moderate (-)	Moderate (-)
Fauna	Degradation of undeveloped areas adjacent to the footprint	Moderate (-)	Minor (-)
Fauna	Overhead powerline across Phase 2 grassland	Moderate (-)	Minor (-)

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Fauna	Alien plant infestation		Negligible (-)
Fauna	Faunal disturbance	Moderate (-)	Minor (-)
Fauna	Light pollution (Fauna)	Moderate (-)	Moderate (-)
Fauna	Disturbance of cliff-nesting birds in Phase 2	Negligible (-)	Negligible (+)
Agriculture	Reduction of grazing land available for the cattle of the surrounding communities	Moderate (-)	Minor (-)
Agriculture	Disturbance of soil horizon organization and associated hydrogeology	Moderate (-)	Minor (-)
Agriculture	Deliberate compaction of soil where access roads will be constructed as well as areas directly next to access roads	Moderate (-)	Moderate (-)
Agriculture	Exposing bare soil surface to wind and water energy causes soil erosion	Minor (-)	Negligible (-)
Agriculture	Soil pollution with materials used for construction as well as oil and fuel from vehicles and equipment	Minor (-)	Negligible (-)
Heritage	Destruction of protected structures, farmstead complex 1	Minor (-)	Minor (-)
Heritage	Destruction of protected structures, farmstead complex 2	Minor (-)	Minor (-)
Heritage	Destruction of protected structures remains of structures 1	Minor (-)	Minor (-)
Heritage	Destruction of protected structures remains of structures 2	Minor (-)	Minor (-)
Heritage	Destruction of protected structures remains of structures 3	Minor (-)	Minor (-)
Heritage	Destruction of protected structures, intact structures farmstead 2	Minor (-)	Minor (-)
Heritage	Destruction of protected structures remains of structures associated with farmstead 2	Minor (-)	Minor (-)
Heritage	Destruction of protected structures, cattle dip	Minor (-)	Minor (-)
Heritage	Destruction of protected structures remains of stone structures	Minor (-)	Minor (-)
Heritage	Destruction of protected structures remains of low stone walling	Minor (-)	Minor (-)
Heritage	Destruction/removal of graves, graves associated with farmstead 2.	Moderate (-)	Minor (-)
Heritage	Destruction/removal of graves, grave located southwest of cattle dip.	Moderate (-)	Minor (-)
Visual and landscape	Impact on landscape character and 'sense of place' in Phase 1	Minor (-)	Minor (-)
Visual and landscape	Impact on landscape character and 'sense of place' in Phase 2	Minor (-)	Minor (-)
Visual and landscape	Impact on landscape character and 'sense of place' in Phase 3	Minor (-)	Minor (-)
Visual and landscape	Loss of the landscape VAC leading to increased visual intrusion in Phase 1	Minor (-)	Negligible (-)
Visual and landscape	Loss of the landscape VAC leading to increased visual intrusion in Phase 2	Minor (-)	Minor (-)
Visual and landscape	Loss of the landscape VAC leading to increased visual intrusion in Phase 3	Minor (-)	Minor (-)
Visual and landscape	Visibility of night-time lighting in Phase 3 - Increased levels of night-time lighting within the Study Area.	Minor (-)	Negligible (-)
Macroeconomic	The implementation of the proposed development could assist with further diversifying the regional economy	Moderate (+)	Not assessed
Macroeconomic	The proposed development offers an opportunity to attract additional foreign and domestic investment into the local economy		Not assessed
Macroeconomic	Local labour supply side constraints (i.e., a mismatch of skills from the local community) could over the short- to medium term be met through the "importation" of labour.	Minor (-)	Not assessed
Macroeconomic	Increased demand for social facilities and amenities.	Minor (+)	Not assessed
Macroeconomic	In-flux of employment seekers	Moderate (-)	Not assessed
Macroeconomic	Population increase would have to be met by a concomitant increase in a local policing capacity	Minor (-)	Not assessed
Macroeconomic	Speculative pricing activity in nearby towns can be expected	Moderate (+)	Not assessed
Macroeconomic	Sustained demand for new development (i.e., residential, retail, etc.)	Moderate (+)	Not assessed
Macroeconomic	The increased prospect of informal settlements	Minor (-)	Not assessed
Socioeconomic	Employment opportunities.		
Socioeconomic	Procurement of goods and services		
Socioeconomic	Skills development and capacity building	Moderate (+)	Moderate (+)
Socioeconomic	Halting of illegal sand mining	Negligible (+)	
Socioeconomic	Loss of grazing land		Moderate (+)
Socioeconomic	Population influx.	Moderate (-)	Minor (-)
Socioeconomic	Health and safety.	Moderate (-)	Minor (-)
Socioeconomic	Employment opportunities		
Socioeconomic	Improved road infrastructure.		
Socioeconomic	Halting of illegal sand mining.	Negligible (+)	

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Socioeconomic	Loss of grazing land		
Socioeconomic	Procurement of goods and services.		
Socioeconomic	Potential community expansion.		Moderate (-)
Socioeconomic	Population influx.	Moderate (-)	Minor (-)
Socioeconomic	Health and safety.	Moderate (-)	Minor (-)
Socioeconomic	Employment opportunities	Moderate (+)	
Socioeconomic	Procurement of goods and services.	Moderate (+)	
Socioeconomic	Skills development and capacity building	Moderate (+)	Moderate (+)
Socioeconomic	Halting of illegal sand mining.	Negligible (+)	
Socioeconomic	Population influx.	Moderate (-)	Minor (-)
Socioeconomic	Health and safety.	Moderate (-)	Moderate (-)
Traffic	Congestion associated with the construction phase	Minor (-)	Minor (-)
Traffic	Road Safety	Minor (-)	Minor (-)
Aviation	No impact predicted	No impact	No impact
Air quality	Fugitive dust: Increased Light Commercial Vehicle (LCV)	Minor (-)	Negligible (-)
Air quality	Fugitive dust: Excavation work.	Minor (-)	Negligible (-)
Air quality	Fugitive dust: Movement of material.	Minor (-)	Negligible (-)
Air quality	Fine Fugitive dust: Stockpiles (if applicable – since mainly storage sites are foreseen).	Negligible (-)	Negligible (-)
Air quality	Additional noxious vehicle exhaust fumes.	Minor (-)	Negligible (-)

Table 11: Summary of the operational phase impacts & risks

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Hydropedology	Poor quality seepage and runoff from vehicles parked at the site and from ruptured sewer lines.	Negligible (-)	Neutral
Hydropedology	Disturbing the inner-soil architecture altering natural flow processes	Negligible (-)	Negligible (-)
Hydropedology	Treated effluent discharge into rivers/streams/wetland units	Negligible (-)	Negligible (-)
Hydropedology	Soil subsidence/erosion in areas which were backfilled with collapsible soils; water leakages from the stormwater system or sewer leakages may cause soil subsidence/erosion.	Negligible (-)	Neutral
Hydropedology	Pollution of watercourse and/or groundwater	Negligible (-)	Neutral
Hydropedology	Stormwater runoff, contamination, erosion, pollution, sedimentation	Negligible (-)	Neutral
Hydropedology	Poor quality runoff/seepage may impact soil quality and contaminate the surrounds	Negligible (-)	Neutral
Hydrology	Impacts on water quality	Minor (-)	Minor (-)
Hydrology	Increase in Surface Runoff	Moderate (-)	Minor (-)
Hydrology	Water Quality: Increase in contaminated runoff from hardened surfaces.	Moderate (-)	Minor (-)
Aquatic and wetlands	Alteration of hydrological and geomorphological processes (erosion and sediment).	Moderate (-)	Minor (-)
Aquatic and wetlands	Impacts on water quality	Moderate (-)	Negligible (-)
Aquatic and wetlands	Impacts on ecological connectivity and/or ecological disturbance impacts.	Moderate (-)	Minor (-)
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Fauna	Loss of habitat and associated fauna		Moderate (-)
Fauna	Impacts on aquatic ecosystems: hydrology and water quality	Moderate (-)	Moderate (-)
Fauna	Degradation of undeveloped areas adjacent to the footprint	Moderate (-)	Minor (-)
Fauna	Overhead powerline across Phase 2 grassland	Moderate (-)	Minor (-)
Fauna	Alien plant infestation		Negligible (-)
Fauna	Faunal disturbance	Moderate (-)	Minor (-)
Fauna	Light pollution (Fauna)	Moderate (-)	Moderate (-)
Fauna	Disturbance of cliff-nesting birds in Phase 2.	Negligible (-)	Negligible (-)
Agriculture	Runoff from hard surfaces into nearby areas	Minor (-)	Negligible (-)
Agriculture	Soil pollution caused by maintenance work	Minor (-)	Negligible (-)
Heritage	Damage/alteration to protected structures, intact structures farmstead 2.	Minor (-)	Minor (-)

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Heritage	Damage or alteration of graves, graves associated with farmstead 2.	Minor (-)	Minor (-)
Heritage	Destruction or alteration of graves, grave located southwest of cattle dip.	Minor (-)	Minor (-)
Visual and landscape	Impact on landscape character and altering the sense of place in Phase 3 - Further degradation of the rural character and cultural village sense of place through the large-scale expansion of industrial-type infrastructure.	Moderate (-)	Moderate (-)
Visual and landscape	Impact on landscape character and altering the sense of place in Phase 2 - The change in visual character from a 'wooded' unbuilt landscape to a built landscape.	Minor (-)	Minor (-)
Visual and landscape	Impact on landscape character and altering the sense of place in Phase 3 - The change in visual character from a 'wooded' unbuilt landscape to a built landscape.	Moderate (-)	Moderate (-)
Visual and landscape	Impact on landscape character and altering the sense of place in Phase 1 - Further degradation of the rural character and cultural village sense of place through the large-scale expansion of industrial-type infrastructure.	Minor (-)	Minor (-)
Visual and landscape	Impact on landscape character and altering the sense of place in Phase 2 - Further degradation of the rural character and cultural village sense of place through the large-scale expansion of industrial-type infrastructure.	Minor (-)	Minor (-)
Visual and landscape	Impact on landscape character and altering the sense of place in Phase 1 - The visual upliftment of derelict land and potential transformation of existing structures/infrastructure through the introduction of new infrastructure within the area.	Minor (+)	Moderate (+)
Visual and landscape	Loss of the landscape's VAC leading to increased visual intrusion in Phase 3 - Expanding the existing footprint of industrial-type infrastructure and buildings over a large area.	Minor (-)	Minor (-)
Visual and landscape	Loss of the landscape's VAC leading to increased visual intrusion in Phase 1 - Expanding the existing footprint of industrial-type infrastructure and buildings over a large area.	Minor (-)	Minor (-)
Visual and landscape	Loss of the landscape's VAC leading to increased visual intrusion in Phase 2 - Expanding the existing footprint of industrial-type infrastructure and buildings over a large area.	Moderate (-)	Minor (-)
Visual and landscape	Impact on potential sensitive visual receptors in Phase 3 - The visibility and visual exposure from proposed development along the N3 Road.	Moderate (-)	Moderate (-)
Visual and landscape	Impact on potential sensitive visual receptors in Phase 1 - The visibility and visual exposure from proposed infrastructure to nearby residential areas on receptors residing permanently close to the Phase/PDA.	Minor (-)	Minor (-)
Visual and landscape	Impact on potential sensitive visual receptors in Phase 2 - The visibility and visual exposure from proposed infrastructure to nearby residential areas on receptors residing permanently close to the Phase/PDA.	Moderate (-)	Minor (-)
Visual and landscape	Impact on potential sensitive visual receptors in Phase 2 - Visibility and visual exposure of proposed industrial-type infrastructure from scenic roads, especially the change in views towards the steep escarpment.	Minor (-)	Minor (-)
Visual and landscape	Visibility of night-time lighting in Phase 3 - Increased levels of night-time lighting within Phase 3 (PDA1).	Moderate (-)	Minor (-)
Visual and landscape	Visibility of night-time lighting in Phase 1 - Increased levels of night-time lighting within Phase 1.	Minor (-)	Minor (-)
Visual and landscape	Visibility of night-time lighting in Phase 2 - Increased levels of night-time lighting within Phase 2.	Moderate (-)	Minor (-)
Macroeconomic	The implementation of the proposed development could assist with further diversifying the regional economy	Moderate (+)	Not assessed
Macroeconomic	The proposed development offers an opportunity to attract additional foreign and domestic investment into the local economy		Not assessed
Macroeconomic	Local labour supply side constraints (i.e., a mismatch of skills from the local community) could over the short- to medium term be met through the "importation" of labour.	Minor (-)	Not assessed
Macroeconomic	Increased demand for social facilities and amenities.	Minor (+)	Not assessed
Macroeconomic	In-flux of employment seekers	Moderate (-)	Not assessed
Macroeconomic	Population increase would have to be met by a concomitant increase in a local policing capacity	Minor (-)	Not assessed
Macroeconomic	Speculative pricing activity in nearby towns can be expected	Moderate (+)	Not assessed
Macroeconomic	Sustained demand for new development (i.e., residential, retail, etc.)	Moderate (+)	Not assessed
Macroeconomic	The increased prospect of informal settlements	Minor (-)	Not assessed

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Socioeconomic	Employment opportunities		
Socioeconomic	Increased warehouse and logistics service capacity.		
Socioeconomic	Procurement of goods and services.		
Socioeconomic	Skills development and capacity building.	Moderate (+)	
Socioeconomic	Health and Safety		Moderate (-)
Socioeconomic	Improved road connectivity.		
Socioeconomic	Increased warehouse and logistics service capacity.		
Socioeconomic	Procurement of goods and services.		
Socioeconomic	Employment opportunities.		
Socioeconomic	Skills development and capacity building.	Moderate (+)	
Socioeconomic	Health and safety.		Moderate (-)
Socioeconomic	Increased warehouse and logistics service capacity.		
Socioeconomic	Operation Impact. Employment opportunities.		
Socioeconomic	Procurement of goods and services.		
Socioeconomic	Skills development and capacity building.		
Socioeconomic	Health and safety.	Moderate (-)	Moderate (-)
Traffic	The demand for the transportation of people and goods will increase proportionately.	Moderate (-)	Minor (+)
Traffic	Ongoing maintenance and road safety.	Minor (-)	Minor (+)
Aviation	No impact predicted	No impact	No impact
Air quality	Fine Fugitive dust: Stockpiles (if applicable – since mainly storage sites are foreseen).	Negligible (-)	Negligible (-)
Air quality	Fine Fugitive dust: Movement of material (if applicable – since mainly storage sites are foreseen).	Negligible (-)	Negligible (-)
Air quality	Fine fugitive dust from vehicle movement on gravel roads.	Minor (-)	Negligible (-)
Air quality	An additional quantity of noxious vehicle exhaust fumes.	Minor (-)	Negligible (-)
Air quality	Emission of primary pollutants: PM, PM10, PM2.5 and metals such as Mn (if applicable – since mainly storage sites are foreseen).	Moderate (-)	Minor (-)
Air quality	Emission of gaseous pollutants: such as NOx (if applicable – since mainly storage sites are foreseen).	Moderate (-)	Minor (-)
Climate Change Vulnerability and Risk	Risks associated with increased Air temperature	Minor (-)	Not applicable
Climate Change Vulnerability and Risk	Risks associated with increased rainfall changes and flooding		Not applicable
Climate Change Vulnerability and Risk	Risks associated with increased tropical cyclones and storms	Minor (-)	Not applicable
Climate Change Vulnerability and Risk	Risks associated with increased damaging winds	Negligible (-)	Not applicable
Climate Change Vulnerability and Risk	Risks associated with increased water stress and drought	Minor (-)	Not applicable

Table 12: Summary of the Decommissioning phase impacts.

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		
Heritage	Damage/alteration to protected structures, intact structures farmstead 2.	Negligible (-)	Negligible (-)
Heritage	Damage or destruction of graves, graves associated with farmstead 2.	Minor (-)	Minor (-)
Macroeconomic	The implementation of the proposed development could assist with further diversifying the regional economy	Moderate (+)	Not assessed
Macroeconomic	The proposed development offers an opportunity to attract additional foreign and domestic investment into the local economy		Not assessed
Macroeconomic	Local labour supply side constraints (i.e., a mismatch of skills from the local community) could over the short- to medium term be met through the “importation” of labour.	Minor (-)	Not assessed

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Macroeconomic	Increased demand for social facilities and amenities.	Minor (+)	Not assessed
Macroeconomic	In-flux of employment seekers	Moderate (-)	Not assessed
Macroeconomic	Population increase would have to be met by a concomitant increase in a local policing capacity	Minor (-)	Not assessed
Macroeconomic	Speculative pricing activity in nearby towns can be expected	Moderate (+)	Not assessed
Macroeconomic	Sustained demand for new development (i.e., residential, retail, etc.)	Moderate (+)	Not assessed
Macroeconomic	The increased prospect of informal settlements	Minor (-)	Not assessed
Aviation	No impact predicted	No impact	No impact
Air quality	Fugitive dust: Increased Light Commercial Vehicles (LCV)	Minor (-)	Negligible (-)
Air quality	Fugitive dust: Movement of material.	Minor (-)	Negligible (-)
Air quality	Fine Fugitive dust: Stockpiles (if applicable – since mainly storage sites are foreseen).	Minor (-)	Negligible (-)
Air quality	An additional quantity of noxious vehicle exhaust fumes.	Minor (-)	Negligible (-)
Air quality	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint		

Table 13: Summary of the Cumulative impacts

Field	Impact	Pre-mitigation significance	Post-mitigation significance
Hydrology	Hydrological impact combined with nearby developments	Moderate (-)	Minor (-)
Aquatic and wetlands	Direct physical loss or modification of wetland and/ or aquatic habitat associated with the onsite watercourses.	Minor (-)	Negligible (-)
Aquatic and wetlands	Alteration of hydrological and geomorphological processes (erosion and sediment).	Minor (-)	Minor (-)
Aquatic and wetlands	Impacts on water quality.	Minor (-)	Negligible (-)
Aquatic and wetlands	Alteration of hydrological and geomorphological processes (erosion and sediment).	Moderate (-)	Moderate (-)
Aquatic and wetlands	Impacts on water quality.	Moderate (-)	Negligible (-)
Aquatic and wetlands	Impacts on ecological connectivity and/or ecological disturbance impacts.	Moderate (-)	Minor (-)
Vegetation	Clearing vegetation and associated disturbance of vegetation related to the development of the footprint for all phases		
Fauna	Cumulative impacts on fauna resources in the Cato Ridge area		Moderate (-)
Agriculture	Land use change from livestock grazing to serviced areas for light industrial use	Minor (-)	Not assessed
Agriculture	Increased areas where hard surfaces result in soil sealing	Minor (-)	Not assessed
Heritage	Damage to heritage resources, protected structures, graves and archaeological sites in the construction phase	Moderate (-)	Minor (-)
Heritage	Damage to heritage resources, protected structures, graves and archaeological sites in the operations phase	Minor (-)	Minor (-)
Visual and landscape	Visual amenities could be positively impacted through the introduction of the new urban development and the associated standardisation of architectural guidelines. This could potentially lead to other existing developments to upgrade their infrastructure to a similar look and feel.	Minor (+)	Not assessed
Visual and landscape	An increase in development could lead to additive impacts due to the influx of people and the sprawling of informal buildings along roads.	Moderate (-)	Not assessed
Visual and landscape	Incremental urban development will result in the loss of the rural character of the area south of the N3, however, the concentration of industrial activities north of the N3 would reduce the impacts of land use change south of N3.	Negligible (-)	Not assessed
Visual and landscape	The new development will make the existing Assmang Cato Ridge Works less conspicuous as it will stand in relation to a built-up area vs. open land (reduced visual intrusion). An increase in visual screening/berms will also lower the overall visibility.	Minor (+)	Not assessed
Visual and landscape	The proposed industrial land uses, and upgrade of road infrastructure could potentially lead to increased heavy vehicle traffic in the area, which will negatively impact the overall rural character in areas adjacent to the various Phase/PDAs.	Negligible (-)	Not assessed

Visual and landscape	Current warehouses and logistic facilities (north of the N3) which are currently visible, but not that noticeable, will become more noticeable through the massing of similar type structures.	Negligible (-)	Not assessed
Visual and landscape	The proposed developments will cumulatively add to the existing industrial sense of place and consolidate industrial land uses north of the N3 as per LAP.	Moderate (-)	Not assessed
Socioeconomic	Impacts related to population influx.		Minor (-)
Socioeconomic	Impacts related to community health.		Minor (-)
Socioeconomic	The multiplier effect on the local economy.	Moderate (+)	
Traffic	The cumulative impact of this project on traffic (congestion, safety, infrastructure)	Moderate (-)	Not assessed
Green House Gas Emissions	Climate Change Impact.		Minor (-)

4 ROLES AND RESPONSIBILITIES FOR IMPLEMENTATION OF THE EMPR

This Chapter describes the roles and responsibilities of the various parties involved with the construction of the proposed development.

4.1 PROJECT COMPANY

The Project Company refers to the holder of the Environmental Authorisation (EA) who will assume overall responsibility for the administration and implementation of the EA and EMPr. Cato Ridge Development Company Limited will be the Project Company. The Project Company will be responsible for the following tasks amongst others:

- Ensure that all conditions of approval as contained in the EA are adhered to.
- Ensure that the requirements as set out in this EMPr are adhered to and implemented.
- Ensure all authorisations, permits, and consents are in place and any other legal requirements are settled before any action is undertaken that requires these to be in place.
- Provide resources and appoint external contractors as required for the implementation of this plan.
- Review and update the EMPr to include relevant conditions of approval contained in the EA (if applicable) or where necessary.
- Provide all principal contractors working on the project with a copy of this EMPr as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts.
- Ensure close liaison with local municipal managers, local councillors and other stakeholders involved in socio-economic development to ensure that the project is integrated into wider socio-economic development strategies and plans for the area.
- [Appoint an independent Environmental Auditor to undertake audits under Regulation 34 of the 2014 EIA regulations \(as amended\) and submit an audit report to the Competent Authority.](#)

4.2 DEVELOPER

Generally, the developer or applicant would refer to the holder of the Environmental Authorisation (EA). However, in this case, the Developer will be a selected entity appointed by the Project Company to execute the work on their behalf. This entity, would assume overall responsibility for the administration and implementation of the EA and EMPr.

The Developer will be responsible for the following tasks amongst others:

- Impact on landscape character and sense of place;
- Ensure that all conditions of approval as contained in the EA are adhered to;
- Ensure that the requirements as set out in this EMPr are adhered to and implemented;
- Ensure all authorisations, permits, and consents are in place and any other legal requirements are settled before construction commences;
- Allocate the responsibilities assigned to the ECO to an independent suitably qualified individual prior to the start of construction activities on-site; and
- Provide all principal contractors working on the project with a copy of this EMPr as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts.

4.2.1 ENVIRONMENTAL SITE AGENT (ESA)

- A suitably qualified ESA is to be appointed by the Developer for the duration of the construction phase. The appointment must take place prior to the commencement of any construction activities. The ESA is

undertaking day-to-day on-site monitoring of construction activities, compliance with this EMPr and specific conditions contained in the EA. The ESA's terms of reference include, but are not limited to:

- Day-to-day monitoring of the implementation of this EMPr;
- It is recommended that the ESA be on-site daily when work is being undertaken in sensitive environments e.g. watercourses, vegetation and during the initial construction activities which include amongst others site demarcation, identification of no-go areas, relocation of vegetation, vegetation clearance, site camp establishment and vegetation replantation;
- The ESA must assist the contractor with the environmental training of any new staff members or staff who did not attend the ECO's environmental induction training. On-going environmental awareness also falls within the responsibilities of the ESA;
- Submit weekly compliance reports to the ECO;
- Attend contractor and engineering site meetings where relevant or where attendance is requested;
- Maintain a detailed photographic record of construction activities;
- Maintain a register of site instruction, non-compliances and action items and submit weekly to the ECO;
- Keep all approved method statements on record/file.
- Liaise with the public should there be any complaints, keep a register of any complaints and report to the ECO on a weekly basis; and
- The ESA must immediately consult with the EO, SE and ECO should any non-compliances meriting a 'stop-work' instruction be observed.

4.3 SITE ENGINEER (SE)

The SE is responsible for ensuring that the contract is carried out to completion on time, within budget and that each Contractor fulfils his/ her obligations in terms of conditions contained in the contracting document, which will include the EA and EMPr.

4.4 CONTRACTOR

The Contractor must ensure that all of its sub-contractors, employees, etc., are fully aware of the environmental issues detailed in this EMPr. The Contractor shall liaise closely with the Developer, Site Engineer (SE), and the Independent Environmental Control Officer (ECO) and must ensure that the works on site are conducted in an environmentally sensitive manner (to prevent actions that may cause environmental harm) and fully in accordance with the requirements of the EMPr, at all times.

The contractor must ensure compliance of all site personnel/visitors to the EMPr and other conditions of authorisation, where relevant. The contract shall appoint a senior member of staff to the role of Environmental Officer (EO) who will serve as the point of contact for all environmental affairs and will be responsible for managing the Contractor activities in compliance with the provisions of the EMPr and EA as well as any corrective action requests by the ESA and ECO.

4.5 INDEPENDENT ENVIRONMENTAL CONTROL OFFICER (ECO)

The Developer shall appoint a suitably qualified ECO (for each development site) to monitor the Contractor's compliance in terms of this EMPr and the conditions contained in the EA, as well as address environmental site issues. The independent ECO shall work in close relation with the Contractor's appointed EO. The designation is reserved for a suitably qualified (National Diploma / Degree in Natural Science or an equivalent qualification), independent, environmental manager, with adequate environmental knowledge to understand and implement the EMPr.

- The duties of the ECO include but are not limited to:
- Liaison with the Developer, Project Manager and/or Engineer and KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA);
- Update the EMPr to include relevant conditions of approval contained in the EA (if applicable);
- Conduct environmental induction training with the contractor prior to the commencement of work

- Undertake ECO site inspections. The frequency of site inspections can be determined between the ECO, SE, Environmental Site Agent (ESA) or any specific conditions of authorisation contained in the EA. It is recommended that the ECO be supported by a full-time ESA during the initial construction period/activities and that the ECO undertake monthly ECO inspections with the ESA. The ECO must attend/arrange a site meeting with the engineer, contractor and other relevant project team members during his/her site inspection to discuss any environmental matters;
- Compilation of ECO Reports that must be submitted to the project team, EDTEA, and developer(or any other authority/body deemed necessary by the project team). The ECO must liaise with the ESA to ensure that action items are carried out;
- Review ESA weekly compliance monitoring reports and include information in monthly ECO Reports;
- Monitoring compliance with the various environmental conditions/requirements contained in the EA and EMPr;
- Assist the ESA in reviewing the Contractor's method statements;
- Ensuring that the required remedial action is implemented in the event of non-compliance;
- Ensuring the proactive and effective implementation and management of environmental protection measures;
- Ensuring that a register of public complaints is maintained by the Contractor and that any and all public comments or issues are appropriately reported and addressed;
- Attend monthly site meetings; and
- Recording and reporting of environmental incidents.

4.6 SPECIALISTS

Apart from the EA which needs to be in place prior to commencement of any construction activities, the required WUL must also be obtained from the Department of Water and Sanitation (DWS) before the water use commences.

Prior to construction, there is to be verification that the biodiversity offsets requirements are met (in agreement with the environmental authorities). Additionally, a botanist or ecologist must walk the final footprint of the development plus 20m and within the growing and flowering period of the Vulnerable plant species or Species of Conservation Concern (SCC), to determine the number of protected floral species that might be displaced or that may be impacted on by the final development layout. Where individual plants or subpopulations of the Vulnerable species, as well as provincially protected plants, will be impacted, these plants must be relocated by a botanist or horticulturist. This can only take place once the developer has been granted a permit to do such work. The ECO must be knowledgeable of licencing and permitting requirements (issued and required) for the project and can assist the contractor with obtaining such permits.

A heritage specialist may also need to confirm the presence of heritage features or structures older than 60 years and where required written application to be made for permit/s to destroy remains of structures with a complete photographic record of the site and a permit issued by Amafa.

4.7 ENVIRONMENTAL AUTHORITY

The EDTEA is the Competent Authority (CA) responsible for issuing the EA and compliance with the conditions of authorisation contained in the EA and relevant environmental legislation. It has the following powers with respect to the project:

- Enforcement of the EA and its conditions;
- Review the EMPr and any required updates or revisions;
- Compliance inspection site visits;
- Review ECO and audit reports;
- Review incident reports (if required by the EA); and
- Enforcement in the event of contraventions of the EMPr or EA.

4.8 ENVIRONMENTAL AUDITS

The Environmental Auditor shall conduct a compliance audit at the interval specified in the Environmental Authorisation⁶ and produce an Environmental Audit that complies with the requirements of Appendix 7 of the 2014 EIA Regulations (as amended). The environmental audit report must provide recommendations regarding the need to amend the EMPr. The objective of the environmental audit report (in terms of NEMA) is to -

- (a) report on-
 - (i) the level of compliance with the conditions of the environmental authorisation and the EMPr; and
 - (ii) the extent to which the avoidance, management and mitigation measures provided for in the EMPr and closure plan achieve the objectives and outcomes of the EMPr and closure plan;
- (b) identify and assess any new impacts and risks as a result of undertaking the activity;
- (c) evaluate the effectiveness of the EMPr;
- (d) identify shortcomings in the EMPr; and
- (e) identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMPr.

4.9 WORKING AREA

The working area is regarded as the land and any other place on, under, over, in or through which the works are to be executed or carried out, and any other land or place made available by the developer in connection with the works. The Working Area shall include the site office, construction camp, stockpiles, batching areas, the construction area, all access routes (from the point where it leaves the nearest public road) and additional areas to which the Engineer permits access. The construction footprint must be kept to a minimum.

The site must be clearly, and appropriately demarcated and no-go areas must be clearly identified with appropriate signage. The ECO must brief contractor staff regarding the requirements of no-go areas.

All works must be kept within the authorised footprint of the site. Areas disturbed outside of the individual sites (but still within the development footprint) must be rehabilitated through consultation with the ECO.

4.10 COMPLIANCE MONITORING & REPORTING

4.10.1 ECO Schedule

4.10.1.1 Routine Compliance Inspections and Reports:

The Contractor shall allow the ECO (and any officials from EDTEA, should the need arise) access to the site for the purposes of compliance monitoring. The ECO shall undertake routine monitoring of the Contractor's activities for compliance with the various environmental requirements contained in the EMPr; including but not limited to:

- Undertaking routine compliance inspections:
 - On a monthly basis for the duration of the construction phase, or at the defined intervals as provided in the conditions of the EA if these are more frequent.
 - Documenting the findings of each of the inspections. This may take the form of diary entries, a checklist, a report or similar, but should include dated photographic evidence of any identified issues (where possible). Any findings of non-compliance must be clearly communicated to the Contractor, together with timeframes for the implementation of remedial action and closeout.
- Preparing a monthly report:
 - Summarising the findings of the routine compliance inspections undertaken as well as progress on any remedial action that was required during the month in question. In the event of non-compliance, the report might include:

⁶ As provided for in Regulation 26(e) – Contents of Environmental Authorisation

- Relevant/supporting documentation or evidence of the non-compliance (e.g., minutes of any meetings held to discuss the non-compliance, email/written correspondence on the matter, dated photographic evidence).
- Remedial action may be required to remedy non-compliance or prevent repeat occurrences, including responsible persons and deadlines for such action.
- Dates of eventual compliance or close-out by the Contractor on previous non-compliance findings.
- Making reports available to the Contract Manager and the Contractor, and to EDTEA on request.
- Attending or submitting the monthly report to a minimum of one monthly progress meeting with the project team, which shall include the Contract Manager, the Contractor and the ESA (or representatives).

4.10.1.2 **Environmental Emergencies, Incidents or Events:**

Should there be any environmental emergencies or incidents, then the ECO may also elect to inspect the site in the event of these. The ECO shall ensure that any entries in the Environmental Incident Report File and Complaints Register are tabled at the monthly progress meeting and appropriately addressed.

4.10.2 **Environmental Incident report file**

The Contractor shall keep an Environmental Incident Report File (EIRF) on site to document any environmental incidents, emergencies or accidents occurring as a result of the construction activities, and any resulting action taken to remedy the harm, and/or prevent repeat occurrences.

- The EIRF must have numbered pages. Any missing pages must be accounted for by the Contractor.
- Entries made shall be tabled during monthly site meetings.
- The EIRF shall be made available to the SE/Contract Manager, the ECO, the Developer, the Project Company, and/or any authority at any time if requested.
- The EIRF is to make provision for the documentation of:
 - The exact nature of the environmental incident.
 - The management team or contractor responsible for the activity.
 - The timing and duration of the event.
 - Witnesses to the event.
- The exact response action applied, including a list of those notified of the problem.

The Contractor shall ensure that the environmental incidents and resulting action are recorded in the EIRF, and that these are brought to the attention of the ECO as soon as practically possible. The procedure for dealing with an environmental incident shall include that:

- The EIRF is to be filled in by the ESA in the event of an environmental incident or emergency.
- The ESA is to immediately inform the Contractor and ECO of any environmental emergency for a decision on remedial action.
- The ECO is to document any incidents/emergencies in the monthly compliance report, together with the remedial action taken, as described in the EIRF.
- The ECO shall monitor that the necessary procedures and responses are followed by the Contractor to close out any entries in the EIRF within the specified timeframe.
- Once an incident or emergency has been adequately addressed to the satisfaction of the ECO, the ESA is to close out the entry in the EIRF.

4.10.3 **Complaints register.**

The Contractor shall keep a Complaints Register on site to allow the general public to document any comments on or complaints regarding the activities of the site:

- The Complaints Register must have numbered pages. Any missing pages must be accounted for by the Contractor.
- Entries made shall be tabled during monthly site meetings.
- The Complaints Register shall be made available to the SE/Contract Manager, the ECO, the Project Company, and/or any authority at any time if requested.

The Complaints Register shall include a section for the documentation of the action taken to address the complaint. The procedure for dealing with public complaints shall include:

- All complaints shall be investigated, and a response shall be given to the complainant within 28 calendar days.
- The ESA shall document the action taken to investigate, and address (if required) the complaint, as well as the response given (including timeframes).
- The ECO shall monitor that the complaints have been responded to.

4.10.4 Health and Safety Aspects

In so far as this EMPr contains mitigations provided by specialists that relate to Health and Safety aspects, these are provided for completeness of the EMPr. Should such proposed mitigations and/or actions contradict those in project specific Health and Safety plans, the content of the Health and Safety Plans shall prevail.

4.11 METHOD STATEMENTS

An environmental Method Statement is a written submission by the Contractor to the SE/Contract Manager, to the satisfaction of the ECO, in response to a condition of approval and/or a requirement of the EMPr, or a request by the ECO or SE/Contract Manager. The Method Statement describes the plant, materials, labour and method that the Contractor proposes to use to carry out an activity, in such detail that the SE/Contract Manager and ECO are able to assess whether the Contractor's proposal is in accordance with the Scope of Work and/or will produce results in accordance with the EMPr.

Method Statements are required in terms of this EMPr (either specified below, or for any activities that are proposed as variations to the standard construction practices detailed or referred to in the Contract Documents, or for any activities requiring special attention as specified in this EMPr and/or requested by the ECO or SE/Contract Manager as well as any requirements of permits or licenses such as a Water Use License).

The Contractor shall not commence any activity until the Method Statement in respect thereof has been approved by the SE and shall, except in the case of emergency activities, allow a period of one week for consideration of the Method Statement by the SE/Contract Manager and ECO. Changes may be requested if the proposal does not comply with the specification or if, in the reasonable opinion of the SE/Contract Manager and/or ECO, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by the EMPr:

- Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.
- Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the works in accordance with the approved Method Statement.

Any proposed changes to the original approved environmental Method Statements require the submission of amended Method Statements for approval.

4.11.1 Required Method Statements

The following required Method Statements (as relevant and if not already required in terms of the Contract) are to be provided and approved prior to Contractor's arrival on site:

- **Emergency preparedness** – which shall address procedures and equipment for medical emergencies, runaway fires, environmental incidents, site evacuation and staff assembly. This must include the onsite modular wastewater treatment work.
- **Site establishment** – which shall address Contractor's camp/s, lay-down or storage areas, site access and required infrastructure.
- **Ablution facilities** – which shall address washing facilities (including methods for managing grey water) and toilets (including the number of locations and method of securing portable/chemical toilets to the ground (if not trailer versions), the proposed service providers to remove and dispose of resultant waste and their service schedule).

- **Hazardous Chemical Substances** (as defined in the Regulations for Hazardous Chemical Substances in GN 179 (25 August 1995)), hydrocarbon substances (which includes all fuels and oils) or dangerous goods to be used – which shall address the storage, handling and disposal procedures of the materials.
- **Hydrocarbon spills** – which shall address the procedures, reporting and training required to address accidental spills.
- **Concrete Mixing and matching plants** – which shall address locations, bunding, and cement-laden water management.
- **Waste Management** – which shall address the type of waste anticipated; the storage, handling, reuse, recycling and/or disposal procedures proposed, together with the facilities proposed to receive such waste.

The following required Method Statements (as relevant and if not already required in terms of the Contract) are to be provided at least 14 calendar days prior to the programmed commencement date of the subject works or activity:

- No-Go area demarcation and access control within the approved development site/servitudes.
- Workshop and plant servicing.
- Vegetation clearing – including methods and areas for clearing and felling, as well as translocation requirements.
- Stockpile management – including proposed locations and erosion management.
- Access management – including proposed engagement with affected landowner/s, proposed routes, gates, and fencing, crossings, access control, existing services management.
- Working in watercourses or wetlands - access, crossings, dewatering activities.
- Heritage Resource protection within the development site.

4.11.2 Additional Method Statements (on request)

Method statements may also be requested by the ECO or SE/Contract Manager as the need arises. The Contractor shall submit any additional Method Statements that arise within such reasonable time as the ECO or SE/Contract Manager shall specify.

4.11.3 Content

For each instance when it is required or requested that the Contractor submit a Method Statement to the satisfaction of the ECO, the format shall clearly indicate the following:

- **Who:** Nominated representative and their assigned responsibilities (in relevant instances).
- **What:** A brief description of the activity to be undertaken (and in relevant instances, the proposed variation from or deviation from the Contract Documentation, or this EMPr).
- **How:** A detailed description of the work, methods, materials, or process proposed (and in relevant instances any reinstatement/rehabilitation requirements).
- **Where:** A description/sketch map of the locality of work or layout proposed.
- **When:** The sequencing of actions with due commencement dates and completion date estimates.

The Contractor (and, where relevant, any sub-contractors) must also sign the Method Statement, thereby indicating that the work will be carried out according to the methodology contained in the approved Method Statement.

4.12 ENVIRONMENTAL AWARENESS TRAINING AND STAFF INDUCTION

The Contractor shall ensure that all staff receive site environmental awareness and staff induction training in appropriate languages, as well as any refresher courses, pertaining to their role on the project, including that:

- All personnel (including sub-contractors) shall receive induction training on the Code of Conduct and project-specific environmental awareness relating to the conditions of the EA and EMPr prior to commencing with any site activities.

- All personnel shall receive induction training on the emergency procedures to be followed in the event of an emergency (e.g., staff assembly and site evacuation, medical emergencies, the locations and basic use of fire extinguishers, first aid kits and spills kits, and the use of safety equipment (where relevant)).
- Relevant staff (including sub-contractors) shall receive induction training on landowner considerations, including access and transport routes on each property, gate management, communication expectations, etc.
- All personnel (including sub-contractors) shall receive regular toolbox talks and refresher courses on the induction material, and project-specific environmental awareness for the duration of the contract, including “lessons learnt” to prevent recurring issues.

The SE/Contract Manager and Contractor will conduct environmental induction training with personnel and must address, amongst others:

- Explanation of the environmental process that preceded the EA and why it was important to conduct the environmental process.
- Explanation of the conditions of authorisation contained in the EA.
- The sensitive environmental features are located within and around the site.
- The reasons why mitigation measures are required and the benefits of implementing these measures.
- The EMPr and its contents (e.g., no-go areas, animals, littering etc.); and
- The role of the ECO.

4.13 TEMPORARY SITE CLOSURE

If the site is closed for a period exceeding one week during the construction or decommissioning phase, the Contractor, in consultation with the ECO shall carry out the following checklist procedure.

- Hazardous materials stores (i.e. fuels, lubricants, paint, biocides, etc.)
 - The outlet is secure/locked.
 - Bund(s) empty (where applicable)
 - Fire extinguishers are serviced and accessible.
 - Emergency and responsible personnel contact details are displayed on site.
 - Adequate ventilation in hazardous substance stores
- Safety
 - All trenches and manholes are secured and closed.
 - Fencing and barriers in place
 - Material packs (e.g., pile of pipes) secured.
 - Access gates are locked and secured.
- Erosion
 - Wind and dust mitigation in place
 - Slopes and stockpiles at a stable angle
 - Open soil re-vegetated or stabilised.
- Water contamination and pollution
 - Cement and hazardous materials stores secured.
 - Toilets empty and secure.
 - Refuse bins empty and secured.
 - Drip trays empty and secure (where possible)
 - Structures vulnerable to high winds are secured.

4.14 RECORD KEEPING

All records and documents relating to the implementation of this EMPr shall be retained, shall be easily retrievable for the duration of the Contract, and shall be filed by the Contractor for a minimum of 12 months after cessation of activities. These records and documents must be made available to the SE/Contract Manager, ECO and/or relevant authority upon request.

These records and documents shall include (but shall not be limited to) the most recent versions of:

- The Environmental Authorisation.
- Permits, licenses and registrations.
- The EMPr and any associated management plans.
- EIRF and Complaints Register.
- Approved Method Statements.
- Staff induction and environmental training material and attendance registers.
- Checklists for temporary site closure.
- Monthly compliance reports prepared by the ECO.
- Certificates of disposal.
- Disciplinary action (including time penalties or monetary fines) for environmental transgressions.
- Independent Environmental Audits.

4.15 NON-COMPLIANCE AND PENALTIES

Non-compliance with this EMPr must be monitored by the ECO and reported in the monthly ECO Reports. Any non-compliance must be reported to the CA.

Penalties or fines must be issued at the discretion of the Engineer as per the penalty agreement between the Engineer and Contractor. The ECO is to take up any non-compliance issues that may result in a fine or penalty with the Engineer.

It should however be noted that the nature of the activities associated with the project, even with the best of intentions, will inevitably cause some form of environmental degradation. The costs of having to make good on such environmental degradation are usually sufficient punishment without the need to look to other punitive measures. The implementation of a penalty system, therefore, requires careful consideration:

- Penalties would typically be warranted by persistent negligence on the part of the Contractor or failure to respond adequately to environmental considerations.
- Removal from the site would typically be warranted where a particular staff member or piece of equipment is the cause of persistent environmental damage following previous warnings; and
- Suspension of the Works would only be warranted under rare circumstances where the Contractor's actions have caused or are likely to cause significant environmental degradation.

The type and extent of the corrective measures required to address non-compliance would depend on the nature of the transgression and the Contractor's history in terms of compliance with their environmental obligations. When deciding on the nature of any punitive actions, however, it is important to recognise that the effective implementation of the Construction EMPr is highly dependent on the quality of the working relationships that develop between the key role players. Accordingly, excessive response to non-compliance, particularly for a minor or unintentional transgression, may cause significant environmental degradation in the long term due to its effect in eroding the Contractor's commitment to meeting their environmental responsibilities. Moreover, other mechanisms, such as an expanded environmental induction programme, may prove more effective than purely punitive measures in controlling non-compliance in the long term. This is an important consideration that must be borne in mind by the Engineer and the Contractor when responding to non-compliances on-site.

Where a transgression occurs due to negligence, or due to disregard for the requirements of the EMPr, or ignoring remedial instruction from the ECO, SE/Contract Manager or relevant Authority, then this is unacceptable and could result in a disciplinary action (e.g., a time penalty or a monetary fine, withholding payment certificates if in accordance with the terms of Contract, or even legal action). The terms of the Contract shall include mechanisms for disciplinary action (such as the issuing penalties and fines) and the recovery of any monies due (including for any remedial costs where these were born by a third party).

The level of non-compliance is ultimately at the discretion of the SE/Contract Manager, ECO and the Environmental Authorities, but a guide to determining this level in the event of negligence or disregard, and the associated minimum monetary fine for consideration is provided in Table 14 below (the table does not include for penalties or other mechanisms of disciplinary action, which could be implemented in addition to the monetary fine). The record shall be kept of any penalties or monetary fines issued for environmental transgressions (refer to 4.14).

Activities that are directly endangering the environment or resulting in a significant and detrimental breach of any Environmental Authorisation or EMPr condition may be stopped by the SE/Contract Manager in consultation with the ECO until such breach is rectified. Regulatory authorities also have the right to stop activities in consultation with the SE/Contract Manager and ECO.

In all instances where costs are incurred in rectifying a breach of the EMPr, enforcing the provisions of the EMPr, or in taking remedial or preventative action to safeguard the environmental integrity, the costs will be recovered jointly or severally from the Project Company, Developer and/or the Contractor in accordance with the provisions of the contract between the respective parties. Note must be taken in this respect of Section 28 of NEMA which places a duty of care for environmental protection on "every person who causes, has caused or may cause significant pollution or degradation of the environment".

Table 14: Guide to fine determination

Level of Non-Compliance	Description	Minimum Fine
Minor non-compliance (1st offence after written warning or at discretion of SE and doubling with each subsequent offence)	A non-conformance with the EMPr that has the potential to result in minor environmental or social consequence	R 2,000.00
Moderate non-compliance (1st offence after written warning or at discretion of SE and doubling with each subsequent offence)	A non-conformance with the EMPr that results in minor environmental or social consequence, or has the potential to result in major environmental or social consequence	R 5,000.00
Major non-compliance (1st offence after written warning or at discretion of SE and doubling with each subsequent offence)	A non-conformance with the EMPr that results in major environmental or social consequence	R 10,000.00

Funds generated by the imposition of fines should be donated to a suitable NGO involved in conservation work at the end of the construction period.

South African law considers the environment as a public trust that must be protected for the benefit of all and imposes fines, imprisonment, and other penalties on those who harm it. The environmental law allows the state to hold polluters liable for current and historic pollution and to convict both corporate entities and their executives. The Green Scorpions are authorised to take tough action against individuals they believe to be responsible for harming the environment, and Environmental Management Inspectors have been given the power to disclose information gathered during their work. Failure to comply with a directive to address pollution is an offence with a penalty of a fine of up to R1 million or imprisonment for up to one year, or both. NEMA's Schedule 3 lists a wide range of offences for contravening legislation regulating heritage resources, water, forests, veld and forest fires, biological diversity and air quality with severe penalties, including fines of up to ten million Rand, imprisonment, and compensation for loss or damage suffered as a result of the offence. The law applies to pollution that occurred before NEMA commenced and to pollution that might arise at a different time from the actual activity that caused the contamination.

5 ENVIRONMENTAL IMPACTS AND MITIGATION

During the EIA, several specialist studies identified and assessed various impacts, and mitigation measures were recommended to address these impacts. The outcome and intent of the impact management recommendations i.e., mitigation measures, is to reduce the level of an impact on the environment to acceptable levels. In line with the mitigation hierarchy, the preference is for the avoidance of impacts, followed by mitigation and compensation.

The proposed development and its various components are superimposed on the identified environmental sensitivities of the site (as identified by the specialists) as shown in Appendix 1. These maps are drawn from the EIR and show the 351 ha project layout and key environmental features and sensitivities of the site as derived from specialists. The sensitivity maps appear in the following sequence:

1. Wetlands and watercourse
2. Flood lines
3. Critical Biodiversity Areas
4. KwaZulu-Natal Sandstone Sourveld (KZNSS)
5. Vegetation condition
6. Faunal sensitivity
7. Important areas for Fauna
8. Agricultural sensitivity
9. Heritage features in relation to Phase 1, Phase 2, Phase 3 (3 maps)

Below is a summary of the impacts and their recommended mitigation measures as detailed in the EIA specialist studies. These mitigation measures must be implemented together with the mitigation measures as set out in the Construction, Operational and Decommissioning Environmental Management Chapters below.

5.1 HYDROPEDOLOGY

5.1.1 Earthworks: site preparation, including placement of contractor laydown areas and storage (i.e., temporary stockpiles, bunded areas etc.) facilities during the Construction phase (All Phases)

5.1.1.1 Mitigation

- Only excavate areas applicable to the project area
- Backfill the material in the same order it was excavated to reduce contamination of deeper soils with shallow oxidised soils.
- Cover excavated soils with a temporary liner to prevent contamination.
- Keep the site clean of all general and domestic wastes. All development footprint areas are to remain as small as possible and vegetation clearing is to be limited to what is essential.
- Retain as much indigenous vegetation as possible.
- Exposed soils are to be protected using a suitable covering or revegetating.
- Existing roads should be used as far as practical to gain access to the site, and crossing watercourses in areas where no existing crossing is apparent should be unnecessary, but if it is essential crossings should be made at right angles.
- Have emergency fuel & oil spill kits on site.
- Soil quality monitoring & visual assessments – monthly basis. If obvious pollution is noted (visually) then it is advised that soil screening be undertaken.

5.1.2 Earthworks: Disturbing vadose zone during soil excavations/infilling activities during the Construction phase (All Phases)

5.1.2.1 Mitigation

- Only excavate areas applicable to the project area
- Backfill the material in the same order it was excavated to reduce contamination of deeper soils with shallow oxidised soils.
- Cover excavated soils with a temporary liner to prevent contamination.
- Keep the site clean of all general and domestic wastes. All development footprint areas are to remain as small as possible and vegetation clearing is to be limited to what is essential.
- Retain as much indigenous vegetation as possible.
- Exposed soils are to be protected using a suitable covering or revegetating.
- Existing roads should be used as far as practical to gain access to the site, and crossing watercourses in areas where no existing crossing is apparent should be unnecessary, but if it is essential crossings should be made at right angles.
- Have emergency fuel & oil spill kits on site.
- Soil quality monitoring & visual assessments – monthly basis. If obvious pollution is noted (visually) then it is advised that soil screening be undertaken

5.1.3 Earthworks: Vegetation clearing & soil stockpiling during the Construction phase (All Phases)

5.1.3.1 Mitigation

- Only excavate areas applicable to the project area
- Backfill the material in the same order it was excavated to reduce contamination of deeper soils with shallow oxidised soils.
- Cover excavated soils with a temporary liner to prevent contamination.
- Keep the site clean of all general and domestic wastes. All development footprint areas are to remain as small as possible and vegetation clearing is to be limited to what is essential.
- Retain as much indigenous vegetation as possible.
- Exposed soils are to be protected using a suitable covering or revegetating.
- Existing roads should be used as far as practical to gain access to the site, and crossing watercourses in areas where no existing crossing is apparent should be unnecessary, but if it is essential crossings should be made at right angles.

5.1.4 Earthworks: Seepage/leakages/overland flow from the sewer lines may cause soil degradation. Moreover, oil & fuel spills from vehicles parked at the site may compromise soil quality. Prolonged pollution may migrate to the nearby watercourse and/or percolate into the groundwater table during the Construction phase (All Phases)

5.1.4.1 Mitigation

- Ensure the sewer system is monitored for leakages. Routine visual inspections of sewer infrastructure and resident parking areas for signs of soil contamination
- Have emergency fuel & oil spill kits on site.

5.1.5 Earthworks: Surface water contamination and sedimentation during the Construction phase (All Phases)

5.1.5.1 Mitigation

- Water quality monitoring and visual assessments
- Install a temporary cut-off trench to contain poor-quality runoff (if required)
- Routine (monthly) inspections of all sewer-related infrastructure (hydraulic monitoring)
- Ensure that stormwater systems conveying water to the nearby river are fitted with silt and oil traps, as well as that surface drains, are isolated from any potential surface pollution sources.

5.1.6 Earthworks: Temporary dewatering of perched groundwater (only expected during intense storm events and shortly thereafter) during the Construction phase (All Phases)

5.1.6.1 Mitigation

- Water quality monitoring and routine visual assessment for contamination
- Discharge dewatered / rainwater collected into the nearby stream. May require authorisation. If water is contaminated, discharge to the closest greywater system (depending on the extent of contamination)

5.1.7 Poor quality seepage and runoff from vehicles parked at the site and from ruptured sewer lines during the Operational phase (All Phases)

5.1.7.1 Mitigation

- Keep the site clean of all general and domestic wastes.
- Water quality of the streams and sewer line monitoring

5.1.8 Soil subsidence/erosion in areas which were backfilled with collapsible soils; water leakages from the stormwater system or sewer leakages may cause soil subsidence/erosion during the Operational phase (All Phases)

5.1.8.1 Mitigation

- Hydraulic monitoring of stormwater systems to ensure that the system operates as per design specifications.
- Retain as much indigenous vegetation as possible.
- Ensure the sewer system is monitored for leakages.
- Routine visual inspections of sewer infrastructure and parking areas for signs of soil contamination
- Have emergency fuel & oil spill kits on site.

5.1.9 Pollution of watercourse and/or groundwater during the Operational phase (All Phases)

5.1.9.1 Mitigation

- Ensure the sewer system is monitored for leakages. Routine visual inspections of sewer infrastructure and resident parking areas for signs of soil contamination. Have emergency fuel & oil spill kits on site.

5.1.10 Stormwater runoff, contamination, erosion, pollution, and sedimentation during the Operational phase (All Phases)

5.1.10.1 Mitigation

- Water quality monitoring and visual assessments

- Install a temporary cut-off trench to contain poor-quality runoff (if required and pre-determined by visual assessments)
- Routine hydraulic monitoring of the stormwater system (monthly)

5.1.11 Poor quality runoff/seepage may impact soil quality and contaminate surroundings during the Operational phase (All Phases)

- Water quality monitoring and visual assessments
- Routine inspections of all sewer-related infrastructure (hydraulic monitoring).

5.2 HYDROLOGY

5.2.1 Alteration of hydrological and geomorphological processes (erosion and sediment) during the Construction phase (All Phases)

5.2.1.1 Mitigation

- Limit the duration of construction (as far as reasonably possible) to reduce the risk of prolonged sedimentation and erosion impacts occurring.
- Implement and adhere to buffer zones for wetlands and riparian areas (as provided in the wetland and aquatic section), with planned development infrastructure to remain outside of the buffer zones.
- Demarcate buffers on the ground to avoid incursions into these areas.
- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Rehabilitate any erosion or vegetation clearing impacts as soon as practically possible and in accordance with a Rehabilitation & Management Plan.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform the management. Revegetate disturbed areas during and after construction completion to the pre-development state.
- Manage stormwater on site (the post-development discharge should equal the pre-development discharge). This can be done through attenuation structures below significant impervious areas/disturbed areas, silt traps and water storage structures.
- Stop activities during and immediately after rainfall events until accumulated water has dissipated and soils have become stable.
- Identify and rectify erosion areas immediately should they occur.
- Preserve topsoil for use in rehabilitation during and after construction completion; and
- Monitoring is important to ensure that the implemented mitigation measures are successful. The following monitoring is required:
 - All impervious and disturbed surfaces are to be monitored to ensure drainage is functional and sediments are not being transported off the site.
 - Ensure all clean water is dissipated towards the natural flow area and all dirty water is directed towards a control structure.

Ensure no sediments are allowed to enter the natural system.

5.2.2 Increase in Surface Runoff during the Construction phase (All Phases)

5.2.2.1 Mitigation

- Manage stormwater on site (the post-development discharge should equal the pre-development discharge). This can be done through attenuation structures below significant impervious areas/disturbed areas, silt traps and water storage structures.
- Stop activities during and immediately after rainfall events until accumulated water has dissipated and soils have become stable.
- Identify and rectify erosion areas immediately should they occur.

- Preserve topsoil for use in rehabilitation during and after construction completion.
- Revegetate disturbed areas during and after construction completion to the pre-development state.
- Implement an adequate stormwater management plan specific to the construction phase.
- Temporary silt traps should be installed around stockpiles or spoil areas. Constructed permanent areas should include attenuation structures that allow clean water to infiltrate.
- Stop activities during and immediately after rainfall events until accumulated water has dissipated and soils have become stable.
- Monitoring is important to ensure that the implemented mitigation measures are successfully monitoring is required:
 - Ensure compacted areas are rehabilitated and revegetated.
 - Ensure all clean water is allowed to infiltrate where possible.
 - Ensure permanent impervious areas have attenuation or flow-dissipating structures.

5.2.3 Impacts on water quality during the Construction phase (All Phases)

5.2.3.1 Mitigation

- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Address potential spill and pollution risks on-site through the implementation of Best Practices (BMPs) in spill and pollution control and hazardous substances management.
- Rehabilitate any spill-related impacts as soon as practically possible in accordance with an “Aquatic Contingency Plan”.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.
- Provide suitable ablution facilities for construction workers with waste removed from the site and disposed of at a suitable location.
- Prevent and manage spills.
- Manage and remove construction waste from the site before it accumulates to a hazardous level (potential point source pollution areas).
- Ensure a spill management plan is in place and appropriate spill management materials are available on site.
- Ensure drip trays are used under machinery/equipment and any storage of hazardous chemicals is in a bunded area.
- Environmentally friendly alternatives to chemicals commonly used should be considered.
- Monitoring is important to ensure that the implemented mitigation measures are successful. The following monitoring is required:
 - The site should be continually checked to ensure vehicles and equipment are not leaking(prevention).
 - Construction areas should be continually checked to identify spill areas. Should a spill be identified, the spill management procedure should be implemented.

5.2.4 Impacts on water quality during the Operational phase (All Phases)

5.2.4.1 Mitigation

- Implement best practice stormwater management design, including erosion protection at outfalls and allowing unimpeded base flows along watercourses.
- Stormwater and energy-dampening systems are to be designed and implemented to decrease the risk of stream bank erosion.
- Maintain stormwater infrastructure as necessary.
- Implement and adhere to 33m and 31m buffer zones for wetlands (15m buffer for Wetlands W14 and W15 and 18m buffer for Wetland (W23) and riparian areas, respectively.
- Wetland rehabilitation focused on re-establishing low energy diffuse flow along the system, rather than concentrated flow along the central drain, as is currently the situation.
- Implement aquatic biomonitoring and water quality monitoring during operation and use findings to inform site management.

5.2.5 Increase in Surface Runoff during Operational Phase (All Phases)

5.2.5.1 Mitigation

- An adequate stormwater management plan is to be designed by an appropriate engineer. Here, the engineer should account for both natural run-off (that which can be released into the natural landscape with no detrimental effect), and excess artificial run-off generated by the proposed development structures.
- Other structures that may be considered are semi-permeable surfaces that can absorb artificial run-off but releases a certain amount into the landscape. Energy-dissipating structures can also be used.

5.2.6 Water Quality: Increase in contaminated runoff from hardened surfaces during the Operational phase (All Phases)

5.2.6.1 Mitigation

- Sewage Treatment Plant:
 - Implement best practice design and operation according to an approved management plan that accounts for expected biological and hydraulic loads, and makes provision for system failures.
 - Develop a maintenance programme that includes regular inspections for wear and tear of mechanical and electrical plant components.
 - Develop a discharge water quality monitoring programme.
 - Wetland rehabilitation focused on re-establishing low energy diffuse flow along the system, rather than concentrated flow along the central drain, as is currently the situation.
 - Implement best practice stormwater management design, including erosion protection at outfalls and allow for unimpeded base flows along watercourses.
 - Maintain stormwater infrastructure as necessary.
 - Implement and adhere to buffer zones for wetlands and riparian areas.
 - Implement bi-monthly aquatic biomonitoring and water quality monitoring in accordance with the 'Aquatic Monitoring Plan' during construction and operations phases and use findings to inform site management.
 - Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
 - Address potential spill and pollution risks on-site through the implementation of Best Management Practices (BMPs) in spill and pollution control and hazardous substances management.
 - Rehabilitate wetlands, riparian areas, and buffer zones in accordance with a 'Wetland Rehabilitation & Management Plan'.

5.2.7 Cumulative Hydrological impact combined with nearby developments (All Phases)

5.2.7.1 Mitigation

- Accumulated stormwater increase due to the combined impervious nature requiring detailed SWMPs
- Share construction access roads.
- Utilize the same spoil areas.
- Utilize water efficiently.
- Create 'green' areas.

5.3 WETLANDS AND AQUATIC BIODIVERSITY

5.3.1 Direct physical loss or modification of wetland and/ or aquatic habitat associated with the onsite watercourses during Construction and Operational phases (All phases)

5.3.1.1 Mitigation

- No areas outside the construction footprint may be cleared and stripped of vegetation. To this end, the outer edges of the construction site must be demarcated using a high visibility barrier/fencing. The demarcation must be signed off by the project ECO.
- Construction staff should be made aware of the location and extent of all watercourses in the vicinity of the proposed development. These should be considered strict no-go zones for the duration of onsite work.
- Drivers and machine operators must take specific care to avoid watercourses when manoeuvring vehicles and heavy equipment.

5.3.2 Alteration of hydrological and geomorphological processes (erosion and sediment) during the Construction phase (All phases)

5.3.2.1 Mitigation

- Limit the extent of disturbed and exposed ground to reduce the risk of prolonged sedimentation and erosion impacts occurring.
- Implement and adhere to buffer zones for wetlands and riparian areas, with planned development infrastructure to remain outside of the buffer zones.
- Demarcate buffers on the ground to avoid incursions into these areas.
- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Rehabilitate any erosion or vegetation clearing impacts as soon as practically possible and in accordance with a Rehabilitation & Management Plan.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.

Implement and adhere to buffer zones for wetlands and riparian areas, with planned development infrastructure to remain outside of the buffer zones as follows:

The buffer model by Macfarlane and Bredin (2016) produces an output for two scenarios based on potential risks associated with the proposed project type, in conjunction with the sensitivity of wetlands and rivers. These two scenarios are (i) without specific mitigation, and (ii) with specific impact/risk mitigation. The tool was used to produce preliminary buffer zone recommendations for watercourses delineated and assessed within the study area. The results of the buffer tool assessment for this land-use option are presented in Table 15 below.

Table 15: Summary of the outcomes of the buffer model (Macfarlane and Bredin, 2016) as it applies to the mixed-use medium-impact land-use scenario (Eco-Pulse, 2023)

Watercourse Type	Project Phase	Recommended Buffer Width	
		Mitigation	
		Without	With
Rivers/ Streams	Construction	33 m	33 m
	Operation	29 m	29 m
	Final	33 m	33 m
Wetlands	Construction	31 m	31 m
	Operation	26 m	26 m
	Final	31 m	31 m
Wetland W14 & W15*	Final		15 m
Wetland W23*	Final		18 m

*Note on the recommended Buffer for Wetland W23, W14, and W15: Proposed land use for specific land parcels associated with development Phase 3 was finalized for use as warehousing and logistics (truck stop type facility) rather than mixed industry. Based on this, Eco-Pulse agreed to run the wetland buffer determination model for the wetlands surrounding the targeted land portions and determined a revised buffer width of 15m (with mitigations) for Wetland Unit 23 and an 18m (with mitigations) buffer Wetland Units 14 and W15. The affected wetlands (W14, W15 and W23) and buffers are shown in Figure 3.

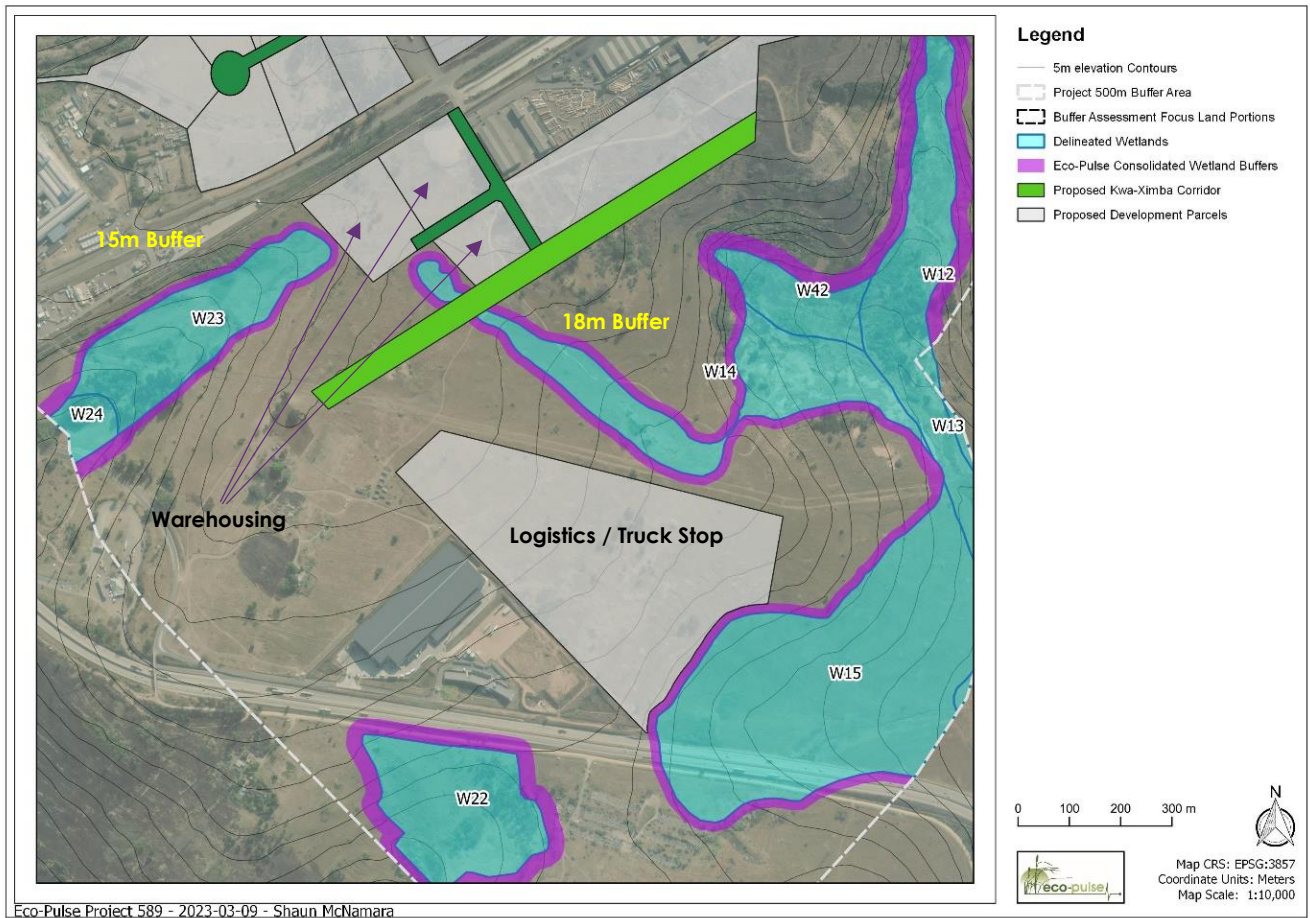


Figure 3: Recommended wetland buffers in relation to wetlands W23, W14, and W15. (Eco-Pulse, 2023)

5.3.3 Impacts on water quality during the Construction phase (All phases)

5.3.3.1 Mitigation

- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Address potential spill and pollution risks on-site through the implementation of Best Management Practices (BMPs) in spill and pollution control and hazardous substances management.
- Rehabilitate any spill-related impacts as soon as practically possible in accordance with an 'Aquatic Contingency Plan'.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.

5.3.4 Impacts on ecological connectivity and/or ecological disturbance impacts during Construction and Operational phases (All phases)

5.3.4.1 Mitigation

- Implement and adhere to buffer zones for wetlands and riparian areas, with planned development infrastructure to remain outside of the buffer zones, and demarcate buffers on the ground to avoid incursions into these areas.
- Implement road/pipeline Method Statement to specification.
- Restrict worker and machinery access to the construction site and site camp only.
- Prohibit poaching or collection of plants and biota from natural areas, including riparian areas and wetlands. Rehabilitate any erosion or vegetation clearing impacts as soon as practically possible and in accordance with the 'Rehabilitation & Management Plan'.

5.3.5 Alteration of hydrological and geomorphological processes (erosion and sediment) during the Operational Phase (All phases)

5.3.5.1 Mitigation

- Implement best practice stormwater management design, including erosion protection at outfalls and allow for unimpeded base flows along watercourses.
- Stormwater and energy-dampening systems are to be designed and implemented to decrease the risk of stream bank erosion.
- Maintain stormwater infrastructure as necessary.
- Implement and adhere to 33m and 31m buffer zones for all wetlands and riparian areas, respectively and apply revised buffer width of 15m (with mitigations) for Wetland Unit 23 and 18m (with mitigations) buffer Wetland Units 14 and W15 (see Figure 3 above)
- Wetland rehabilitation along Wetland W12 focused on re-establishing low energy diffuse flow along the system, rather than concentrated flow along the central drain, as is currently the situation
- Implement aquatic biomonitoring and water quality monitoring during operation and use findings to inform site management.

5.3.6 Impacts on water quality during the Operational phase (All phases)

5.3.6.1 Mitigation

- Sewage Treatment Plant:
 - Implement best practice design and operation according to an approved management plan that accounts for expected biological and hydraulic loads, and makes provision for system failures.
 - Develop a maintenance programme that includes regular inspections for wear and tear of mechanical and electrical plant components.
 - Develop a discharge water quality monitoring programme.
- Wetland rehabilitation along Wetland W12 focused on re-establishing low energy diffuse flow along the system, rather than concentrated flow along the central drain, as currently the situation
- Implement best practice stormwater management design, including erosion protection at outfalls and allow for unimpeded base flows along watercourses.
- Maintain stormwater infrastructure as necessary.
- Implement and adhere to buffer zones for wetlands and riparian areas.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring in accordance with the 'Aquatic Monitoring Plan' during construction and use findings to inform site management.
- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Address potential spill and pollution risks on-site through the implementation of Best Management Practices (BMPs) in spill and pollution control and hazardous substances management.

- Rehabilitate wetlands, riparian areas, and buffer zones in accordance with a 'Wetland Rehabilitation & Management Plan'.

5.3.7 Cumulative Impacts of Direct physical loss or modification of wetland and/ or aquatic habitat associated with the onsite watercourses (All phases)

5.3.7.1 Mitigation

- No areas outside the construction footprint may be cleared and stripped of vegetation. To this end, the outer edges of the construction site must be demarcated using a high visibility barrier/fencing. The demarcation must be signed off by the project ECO.
- Construction staff should be made aware of the location and extent of all watercourses in the vicinity of the proposed development. These should be considered strict no-go zones for the duration of onsite work.
- Drivers and machine operators must take specific care to avoid watercourses when manoeuvring vehicles and heavy equipment.

5.3.8 Cumulative impacts of alteration of hydrological and geomorphological processes (erosion and sediment) (All phases)

5.3.8.1 Mitigation

- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Demarcate buffers on the ground to avoid incursions into these areas.
- Implement and adhere to 33m and 31m buffer zones for wetlands and riparian areas, respectively,
- Implement and adhere to buffer zones for wetlands and riparian areas, with planned development infrastructure to remain outside of the buffer zones.
- Implement aquatic biomonitoring and water quality monitoring during operation and use findings to inform site management.
- Implement best practice stormwater management design, including erosion protection at outfalls and allow for unimpeded base flows along watercourses.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.
- Limit the extent of disturbed and exposed ground to reduce the risk of prolonged sedimentation and erosion impacts occurring.
- Maintain stormwater infrastructure as necessary.
- Rehabilitate any erosion or vegetation-clearing impacts as soon as practically possible and in accordance with a Rehabilitation & Management Plan
- Stormwater and energy-dampening systems are to be designed and implemented to decrease the risk of stream bank erosion.
- Wetland rehabilitation along Wetland W12 focused on re-establishing low energy diffuse flow along the system, rather than concentrated flow along the central drain, as is currently the situation.

5.3.9 Cumulative impacts on water quality (All phases).

5.3.9.1 Mitigation

- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Address potential spill and pollution risks on-site through the implementation of Best Management Practices (BMPs) in spill and pollution control and hazardous substances management.
- Rehabilitate any spill-related impacts as soon as practically possible in accordance with an 'Aquatic Contingency Plan'.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.

- Sewage Treatment Plant:
- Implement best practice design and operation according to an approved management plan that accounts for expected biological and hydraulic loads, and makes provision for system failures.
- Develop a maintenance programme that includes regular inspections for wear and tear of mechanical and electrical plant components.
- Develop a discharge water quality monitoring programme.
- Wetland rehabilitation along Wetland W12 focused on re-establishing low energy diffuse flow along the system, rather than concentrated flow along the central drain, as is currently the situation
- Implement best practice stormwater management design, including erosion protection at outfalls and allow for unimpeded base flows along watercourses.
- Undertake routine inspections and maintain stormwater infrastructure as necessary. Key areas are to be monitored or maintained before expected heavy rain forecasts.
- Implement and adhere to buffer zones for wetlands and riparian areas.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring in accordance with the 'Aquatic Monitoring Plan' during construction and use findings to inform site management.
- Address potential erosion and sedimentation risks on-site through the implementation of Best Management Practices (BMPs) in erosion and sediment control.
- Address potential spill and pollution risks on-site through the implementation of Best Management Practices (BMPs) in spill and pollution control and hazardous substances management.
- Rehabilitate wetlands, riparian areas, and buffer zones in accordance with a 'Wetland Rehabilitation & Management Plan'.

5.3.10 Cumulative impacts to ecological connectivity and/or ecological disturbance impacts (All phases)

5.3.10.1 Mitigation

- Implement and adhere to buffer zones for wetlands and riparian areas.
- Limit instream habitat disturbance.
- Restrict worker and machinery access to the repair/maintenance area.
- Prohibit poaching or collection of plants and biota during repair and maintenance.

5.4 VEGETATION

5.4.1 Clearing vegetation and associated disturbance of vegetation related to the development of the footprint Phases 1, 2 and 3 (All development phases)

5.4.1.1 Mitigation

- Verification that the biodiversity offsets requirements are met (in agreement with the environmental authorities).
- Fence the undeveloped areas and establish effective access controls. Police the sites, focussed on the undeveloped areas, to prevent illegal access impacts (grazing, sand mining, dumping, medicinal plant collection, etc).
- Prevent cattle from accessing the undeveloped areas/conservation areas. Note, motivation has been submitted to EDTEA to allow for further investigation into the potential for sustainable grazing. If approved by EDTEA, further studies will be undertaken by the applicant to demonstrate the potential for grazing within the proposed biodiversity offset areas.
- Firebreaks and fire management. Grassland is to be control burnt every second year, only.
- Eradicate all aliens, particularly by *Acacia mearnsii* (Black Wattle), eucalypts and pines, as well as what are sometimes quite significant *Populus x canescens* infestations in damp grassland, and *Lantana camara* thickets.
- Relocate any species of conservation concern and other conservation important species out of development footprint/disturbance areas into other suitable habitats, either in KwaZulu-Natal Sandstone Sourveld on CRDC

land which will never be developed, or to other development-protected/conservation-secure sites in the eThekweni Municipal Area. Disturbance areas are likely to be at least within 20 metres of footprint areas. A relocation plan must be formulated as a condition of development.

An alien invasive management plan should be developed by a suitably qualified person and implemented and must align with the biodiversity offset management objectives.

5.5 FAUNA

5.5.1 Loss of habitat and associated fauna during Construction and Operational phases (All phases)

5.5.1.1 Mitigation

- Biodiversity Offsets must be in place before the commencement of any activities as determined by the biodiversity offsetting process.
- Improved management of remaining undeveloped portions of the site.

5.5.2 Impacts on aquatic ecosystems: hydrology and water quality during Construction and Operational phases (All phases)

5.5.2.1 Mitigation

- Specified buffers for aquatic features (as detailed elsewhere in this EMPr) must be in place.
- Aquatic ecosystems are not modified or impacted by construction or operation activities.
- Adequate stormwater management, as per the stormwater management plan.
- Maximise permeable surfaces within the footprint.
- Adequate pollution prevention and control systems.
- Monitoring of water quality and ecosystem health - Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.

5.5.3 Degradation of undeveloped areas adjacent to the footprint during Construction and Operational phases (All phases)

5.5.3.1 Mitigation

- All activities are restricted to the footprint area.
- Undeveloped area access controlled.
- External monitoring of these areas - Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.

5.5.4 Overhead powerline across Phase 2 grassland during Construction and Operational phases (Phase 2)

5.5.4.1 Mitigation

- Mechanisms to prevent collision/electrocution.
- Restricted installation sites
- Rehabilitation of pylon sites.

5.5.5 Alien plant infestation during Construction and Operational phases (All phases)

5.5.5.1 Mitigation

- Effective alien control programme and monitoring plan must be developed by a qualified specialist and implemented throughout the project lifecycle. The AIP must align with the objectives for biodiversity offset management.

5.5.6 Faunal disturbance during Construction and Operational phases (All phases)

5.5.6.1 Mitigation

- All activities are restricted to the footprint area.
- Noise levels are to be minimised and regulated in accordance with the Nopise regulations.

5.5.7 Light pollution (Fauna) during Construction and Operational phases (All phases)

5.5.7.1 Mitigation

- All activities are restricted to the footprint area.
- Light levels are to be regulated and minimised to the extent possible.

5.5.8 Disturbance of cliff-nesting birds in Phase 2 during the Construction and Operational phases

5.5.8.1 Mitigation

- Keep development construction activities at an adequate distance from the site edge, as determined by the ECO on commencement of the activities in that area and following an inspection of the site for avifaunal activity.

5.5.9 Cumulative impacts on fauna resources in the Cato Ridge area (All phases)

5.5.9.1 Mitigation

- Biodiversity Offset as determined by the biodiversity offsetting process.
- Improved management of remaining undeveloped portions of the site
- Specified buffers for aquatic features (as detailed elsewhere in this EMPr) must be in place.
- Aquatic ecosystems are minimally modified.
- Adequate stormwater management.
- Maximise permeable surfaces within the footprint.
- Adequate pollution prevention and control systems.
- Monitoring of water quality and ecosystem health.
- Implement bi-monthly aquatic biomonitoring and water quality monitoring during construction and use findings to inform site management.
- All activities must be restricted to the footprint area.
- Undeveloped area access must be controlled.
- External monitoring/ policing of undeveloped/open space areas.
- Mechanisms to prevent avifaunal collision/electrocution with overhead powerlines (if selected as the preferred option by Eskom).
- Restricted installation Sites (limit the number of pylons in good quality KZNSS grassland area associated with Phase 2 Option 2 power supply, west of Phase 2).
- Rehabilitation of pylon sites and construction tracks.

- Effective alien control (according to the Alien Invasive Management plan).
- Noise levels are regulated and monitored by the ECO.
- Light levels are regulated and minimised in all phases.

5.6 AGRICULTURE

5.6.1 Reduction of grazing land available for the cattle of the surrounding communities during the Construction phase (All phases)

5.6.1.1 Mitigation

- Conduct a research study on the inclusion of cattle in the biodiversity offset areas outside the development footprint. Where possible, conservation areas must still allow for cattle grazing.

5.6.2 Deliberate compaction of soil where access roads will be constructed as well as areas directly next to access roads during the Construction phase (All Phases)

5.6.2.1 Mitigation

- Restrict access of delivery vehicles and equipment to existing gravel roads.
- Only store construction materials in designated construction yards.
- Limit any deliberate soil compaction to only the areas where the roads will be constructed.
- Alleviate soil compaction next to roads with deep soil ripping.

5.6.3 Exposing bare soil surface to wind and water energy causes soil erosion during Construction (All Phases)

5.6.3.1 Mitigation

- Limit vegetation clearance to only the areas where earthworks are required.
- Regularly monitor the areas directly next to infrastructure areas for signs of soil erosion.
- Soil erosion around the infrastructure footprint must be rehabilitated.
- Implement Stormwater Management Plan (SWMP) that prevents surface runoff over bare surfaces.

5.6.4 Soil pollution with materials used for construction as well as oil and fuel from vehicles and equipment during the Construction phase (All Phases)

5.6.4.1 Mitigation

- Enforce proper waste management during the construction phase.
- Conduct regular vehicle and equipment checks to ensure that vehicles don't spill oil and fuel.
- In the case of accidental fuel or oil spillage, the spill must be cleaned up immediately.
- Remove all leftover materials from the site after maintenance work.
- Ensure equipment and vehicles are in good condition and do not leak oil or fuel.
- Implement SWMP that directs dirty water away from exposed soil surfaces.

5.6.5 Runoff from hard surfaces into nearby areas during the Operational phase (All Phases)

5.6.5.1 Mitigation

- Regularly monitoring areas outside the hard surfaces for signs of erosion.
- In the case that erosion is detected, immediately rehabilitated eroded areas.

- Monitor vegetation around hard surfaces to ensure there are no bare surfaces.
- Monitor the stormwater management system to ensure it functions properly and does not cause erosion.

5.6.6 Soil pollution caused by maintenance work during the Operational phase (All Phases)

5.6.6.1 Mitigation

- Enforce proper waste management during the operation phase.
- Conduct regular vehicle and equipment checks of maintenance vehicles to ensure that vehicles don't spill oil and fuel.
- Monitor SWMP to ensure that dirty water is channelled away from uncovered soil surfaces.

5.6.7 Cumulative impacts on land use change from livestock grazing to serviced areas for light industrial use (All Phases)

5.6.7.1 Mitigation

- Research and implement a regenerative grazing plan that can co-exist with biodiversity conservation in the off-set areas.

5.6.8 Cumulative impacts on increased areas where hard surfaces result in soil sealing (All Phases)

5.6.8.1 Mitigation

- Maintain effective SWMP for the entire development footprint.
- Leave sufficient areas between hard surfaces for landscaped areas where soil functionality can remain minimally altered.

5.7 HERITAGE

5.7.1 Destruction of protected structures, farmstead complex 1 during the Construction phase (Phase 1)

5.7.1.1 Mitigation

- Written application to the KZN Amafa & Research Institute for permit/s to destroy & remove remains of farmstead complex with a complete photographic record of remains.
- Application approved & permit issued by the Institute. Although structures are in poor condition, they are inhabited hence it is recommended that the structures are not impacted. A 50m buffer is to be placed around the site unless a demolition permit can be secured through Amafa.

5.7.2 Destruction of protected structures, farmstead complex 2 during the Construction phase (Phase 1)

5.7.2.1 Mitigation

- Written application to the Institute for permit/s to destroy & remove remains of farmstead complex with a complete photographic record of structures to be destroyed.
- Application approved & permit issued by the Institute.

5.7.3 Destruction of protected structures remains of structures 1 during the Construction phase (Phase 1)

5.7.3.1 Mitigation

- Unclear if structures are protected. If >60 years, then a written application is to be made to the Institute for permit/s to destroy & remove remains of structures with a complete photographic record of remains.
- Application approved & permit issued by the Institute.

5.7.4 Destruction of protected structures remains of Structures 2 during the Construction phase (Phase 1)

5.7.4.1 Mitigation

- Written application to be made to the Institute for permit/s to destroy & remove remains of structures with a complete photographic record of structures to be destroyed.
- Application approved & permit issued by the Institute.

5.7.5 Destruction of protected structures remains of Structures 3 during the Construction phase (Phase 1)

5.7.5.1 Mitigation

- Age of structures to be determined; if >60 years, then written application to be made to the Institute for permit/s to destroy & remove remains of structures with a complete photographic record of structures and remains of structures.
- Application approved & permit issued by the Institute.

5.7.6 Destruction of protected structures, intact structures farmstead 2 during the Construction phase (Phase 2)

5.7.6.1 Mitigation

- Although structures are in poor condition, they are inhabited hence it is recommended that the structures are not destroyed. 50m buffer to be placed around the site.
- If it is decided to demolish intact structures, then the application must be made to the Institute in terms of the process described in section 3 of the draft KwaZulu-Natal & Research Institute Regulations, 2021. This section outlines the application process for the demolition, alteration or addition to a structure which is, or which may reasonably be expected to be older than 60 years.
- Application approved & permit issued by the Institute.

5.7.7 Destruction of protected structures remains of structures associated with Farmstead 2 during the Construction phase (Phase 2)

5.7.7.1 Mitigation

- Written application to be made to the Institute for permit/s to destroy & remove remains of structures with a complete photographic record of structures and remains of structures.
- Application approved & permit issued by the Institute.

5.7.8 Destruction of protected structures, and cattle dip during the Construction phase (Phase 2)

5.7.8.1 Mitigation

- Written application to be made to the Institute for permit/s to destroy cattle dip with a complete photographic record of cattle dip.
- Application approved & permit issued by the Institute.

5.7.9 Destruction of protected structures remains of stone structures during the Construction phase (Phase 2)

5.7.9.1 Mitigation

- Written application to be made to the Institute for permit/s to destroy remains of stone structures with a complete photographic record of the site.
- Application approved & permit issued by the Institute.

5.7.10 Destruction of protected structures remains of low stone walling during the Construction phase (Phase 2)

5.7.10.1 Mitigation

- Written application to be made to the Institute for permit/s to destroy stone walling with a complete photographic record of walling.
- Application approved & permit issued by the Institute.

5.7.11 Destruction/removal of graves, graves associated with Farmstead 2 during the Construction phase (Phase 2)

5.7.11.1 Mitigation

- Graves are to be left in situ; a 50m buffer is to be placed around the structures including the associated graves.
- The buffer must be visible to construction crews and must be made from sturdy and durable material.
- Access to the grave for family members must be allowed.
- If it is decided to remove the graves, then the procedure provided in section 5 of the Draft KwaZulu-Natal & Research Institute Regulations, 2021 must be followed. This procedure refers to the application process to be followed for the damage, alteration, exhumation, or removal of a grave or burial ground older than 60 years or deemed to be of heritage significance by the Institute.

5.7.12 Destruction/removal of graves, grave located south-west of cattle dip during the Construction phase (Phase 2)

5.7.12.1 Mitigation

- 20m buffer must be placed around the grave in which no activity may take place.
- The buffer must be visible and made of solid & durable material.
- Access to the grave for family members must be allowed.
- If it is decided to remove the grave, then the procedure provided in section 5 of the Draft KwaZulu-Natal & Research Institute Regulations, 2021 must be followed. This procedure refers to the application process to be followed for the damage, alteration, exhumation, or removal of a grave or burial ground older than 60 years or deemed to be of heritage significance by the Institute.

5.7.13 Damage/alteration to protected structures, intact structures farmstead 2 during Operational phase (Phase 2)

5.7.13.1 Mitigation

- A buffer of 50m must be kept in place around the site throughout the operational phase.
- The buffer must be visible and sturdy.
- Access to the graves by family members must be allowed.

5.7.14 Damage/alteration of graves, graves associated with Farmstead 2 during the Operational phase (Phase 2)

5.7.14.1 Mitigation

- As long as the 50m buffer is enforced, then the possibility of damage to the structures should be low.
- If there is damage to the structures, then work in the vicinity of the damage must stop, a heritage specialist called to the site and the Institute was informed. The Institute and specialist will provide the way forward in terms of repairs or whatever action is required.
- There must be access to the structures at all times to allow the residents to come and go as needed.

5.7.15 Destruction/alteration of graves, grave located south-west of cattle dip during operational phase (Phase 2)

5.7.15.1 Mitigation

- The buffer of 20m must be kept in place around the grave throughout the operational phase.
- The buffer must be visible and sturdy.
- Access to the grave by family members must be allowed.
- No operational activities may take place within the buffer.
- If the grave is damaged, all operations must cease near the grave and the Institute must be informed, and a heritage specialist called to the site to provide the way forward.
- The necessary permit for the repair of the damaged grave must be obtained prior to any work continuing near the grave.

5.7.16 Damage/alteration to protected structures, intact structures farmstead 2 during Decommissioning phase (Phase 2)

5.7.16.1 Mitigation

- As long as the 50m buffer is enforced, then the possibility of damage to the structures should be low.
- If there is damage to the structures, then work in the vicinity of the damage must stop, a heritage specialist called to the site and the Institute was informed. The Institute and specialist will provide the way forward in terms of repairs or whatever action is required.
- Access road/s to structures must be left intact to allow the residents to come and go as needed.

5.7.17 Damage or destruction of graves, graves associated with Farmstead 2 during Decommissioning phase (Phase 2)

5.7.17.1 Mitigation

- A buffer of 50m must be kept in place around the site throughout the decommissioning phase.
- The buffer must be visible and sturdy.
- No decommissioning activities may take place within the buffer.
- If the graves are damaged, all operations must cease near the graves and the Institute must be informed and a heritage specialist called to the site to provide the way forward.

- Necessary permits for the repair of the graves must be obtained prior to any work continuing.

5.7.18 Cumulative impacts of damage to heritage resources, protected structures, graves and archaeological sites in the construction phase (All phases)

5.7.18.1 Mitigation

- Protected structures:
 - Leave inhabited structures as is and allow residents to remain in the dwellings. If structures are to be demolished, then give the inhabitants at least 6 months to find alternative accommodation.
 - The developer communicates with the inhabitants on a regular basis.
 - Photographic records of structures to be demolished must be provided to the Institute when the application is made for the demolition of the structures.
 - If structures are going to be left intact, provide the recommended buffer around them.
 - If the structures are damaged because of construction activities around them, then work within 10m of the damaged structure/s must stop and the Institute informed, and a heritage specialist called to the site to inspect the damage and provide a way forward.
- Graves:
 - It is recommended that graves are left in situ and that they are fenced with the recommended buffer distance to ensure that the graves are not impacted by construction activities.
 - If graves are to be removed, then the process provided in section 5 of the Draft KwaZulu-Natal & Research Institute Regulations, 2021 must be followed including a detailed public participation process.
- Archaeological sites:
 - Buffer demarcations must be visible and sturdy.
 - Option 1 is selected for the proposed new power supply and substation. This option is situated away from the project area with no archaeological sites in close vicinity.
 - If Option 2 is selected, then the archaeological sites west of Phase 2 must be demarcated with a 50m buffer in which no activities may take place. The buffer must be highly visible and made from sturdy and durable material or fencing.
 - If archaeological sites are damaged during the construction of Option 2, then work within 15 m of the damaged site or sites must stop and the Institute informed, and a heritage specialist called to the site to inspect the damage and provide the way forward. No work may proceed within 15 m of the site/s until the heritage specialist gives the go-ahead.

5.7.19 Cumulative impacts of damage to heritage resources, protected structures, graves and archaeological sites in the operations phase (All phases)

5.7.19.1 Mitigation

- Protected structures:
 - 50m buffer around the intact protected structures is in place throughout the operational phase. Buffer material to be sturdy and highly visible.
 - If the structures are damaged in any way during this phase, then the Institute needs to be informed and a heritage specialist appointed to assess the damage. The application will need to be made to the Institute for permission to repair the structures. Repairs must be undertaken by a specialist and at the cost of the owner.
- Graves:
 - It is recommended that grave sites are left in situ and that they are fenced with the recommended buffer distance to ensure that the graves are not impacted by operational activities.
 - If graves are damaged, then work within 10 m of the graves must stop, the Institute informed, and a heritage specialist called to the site. The application will need to be made to the Institute for permits to repair the graves. The repair of the graves must be undertaken by a specialist in consultation with the family and at the cost of the business owner.

- Archaeological sites:
 - The archaeological sites must be demarcated with a 50m buffer around them in which no activities may take place. The buffer must be highly visible and made from sturdy and durable material or fencing.
 - If archaeological sites are damaged during the construction of Option 2, then work within 15 m of the damaged site or sites must stop and the Institute informed, and a heritage specialist called to the site to inspect the damage and provide the way forward. The application will need to be made to the Institute for permission to repair the damage which must be undertaken by an archaeologist who specializes in repairs of archaeological sites. The cost of repair work will be for the business owner.

5.8 VISUAL IMPACTS

5.8.1 Loss of the landscape VAC leading to increased visual intrusion in Phases 1, 2 and 3 during the Construction phase

5.8.1.1 Mitigation

- Dust minimization techniques must be implemented.
- All stockpiles are to be protected from dispersion as a result of wind and water.
- Temporary construction signs and barricading must be removed as soon as the particular activity or set of activities are complete and in accordance with health and safety requirements.
- Develop a method statement for post-construction rehabilitation that includes aspects such as:
 - Land restoration.
 - Topsoil storage and replacement.
 - Erosion control.
 - Alien plant control; and reseedling or revegetation (if applicable); and
 - Post-construction monitoring of erosion and rehabilitation. (Use indigenous species for restoration).
- Ensure any imported materials (compost, soil, mulch etc.) and equipment/machinery is alien plant free.

5.8.1.2 Loss of the landscape's VAC leading to increased visual intrusion in Phases 1, 2 and 3 – Expanding the existing footprint of industrial-type infrastructure and buildings over a large area during the Operational phase

5.8.1.3 Mitigation

- The development of architectural and landscape guidelines for proposed buildable areas. (The guidelines should not be restrictive but should promote an overall design sensitivity whilst allowing flexibility for individual expression by the end user.)

5.8.2 Impact on potential sensitive visual receptors in Phases 1, 2 and 3 - The visibility and visual exposure from proposed infrastructure to nearby residential areas on receptors residing permanently close to the Phase/PDA during the Operational phase.

5.8.2.1 Mitigation

- Existing opportunities which include areas set out for conservation purposes, rural residential and areas which are too steep for development will provide natural screening to variable extents.
- The development of landscape architectural guidelines and a master plan for the precinct.

5.9 SOCIO-ECONOMIC IMPACTS

Based on the desktop findings and expert knowledge, impacts were identified and categorised according to the project phase in which the impacts are likely to occur which is the construction and operational phases.

5.9.1 Employment Opportunities during Construction and Operational phases

5.9.1.1 Mitigation

- The end-users must develop an employment policy aimed at maximising employment opportunities for the locals, where possible.

5.9.2 Procurement of goods and services during Construction and Operational phases

5.9.2.1 Mitigation

- The end-users must develop a local Procurement plan aimed at maximising opportunities for local businesses, where possible.

5.9.3 Skills development and capacity building during Construction and Operational phases

5.9.3.1 Mitigation

- The end-users must have in place a skills development plan aimed at improving the skills of employees.

5.9.4 Potential community expansion during Construction and Operational phases

5.9.4.1 Mitigation

- Fence the proposed project footprint.
- Based on the one household located within the development footprint, a detailed social risk analysis must be undertaken (taking cognisance of air quality, noise, and traffic risks) once the development area enters within 100m of the household and associated driveway.

5.9.5 Recruitment of construction workforce during Construction and Operational phases

5.9.5.1 Mitigation

- End-users must develop and implement an Employment policy which must be communicated to key stakeholders.
- End-users must develop and implement a local Procurement plan.
- End-users must develop and implement a Skills development plan aimed at improving the skills of employees.
- End-users must develop and Implement Community and employee health and safety plan as per the recommendations made in other specialist studies viz., air quality, traffic, stormwater drainage, visual assessment, and flood line assessment.

5.9.6 Population influx during Construction and Operational Phases

5.9.6.1 Mitigation

- End-users should plan on how to manage population influx prior to resuming construction activities .

5.9.7 Physical intrusion during Construction and Operational phases

5.9.7.1 Mitigation

The physical intrusion impacts associated with anticipated vibration, noise and dust should be mitigated as per the recommendations of the associated specialist studies undertaken by Zutari. Additionally, where possible

ensure that access to fields and grazing areas is uninterrupted by providing alternative access routes and/or temporary access points during construction activities.

5.9.8 Community health, safety and security during Construction and Operational phases

5.9.8.1 Mitigation

- Liaison structures are to be established with local police and security forums to monitor social changes in crime patterns during the operation phase.
- The developed area, including associated facilities, should be equipped with security measures such as visible streetlights, security personnel at the entrance of every facility, electric fencing and visible security patrol vehicles in the area.
- Liaison structures are to be established with local police to monitor social changes in crime patterns during the operation phase. Liaison should also be established with existing crime control organisations, such as local Community Policing Forums and other crime prevention organisations.

5.10 TRAFFIC

5.10.1 Congestion associated with the construction phase (All Phases)

5.10.1.1 Mitigation

- Minimise Impact during commuter Peaks.

5.10.2 Road Safety during the Construction Phase (All Phases)

5.10.2.1 Mitigation

- Appropriate system management measures by the road authorities, including high-quality signage, safety barriers, flagmen and traffic calming measures.

5.10.3 The demand for the transportation of people and goods will increase proportionately during the Operational phase (All Phases)

5.10.3.1 Mitigation

- Provide additional infrastructure to increase the system capacity.

5.10.4 Ongoing maintenance and road safety during the Operational phase (All Phases)

5.10.4.1 Mitigation

- Appropriate system management measures by the road authorities, including high-quality signage, safety barriers, flagmen and traffic calming measures.

5.11 AIR QUALITY

5.11.1 Baseline Ambient Monitoring during the Pre-Construction phase prior to the commencement of construction (All Phases)

It is recommended that monitoring of Dust Fall Out (DFO) and noxious fumes be conducted to establish additional baseline ambient monitoring data prior to the commencement of construction of the development and

continue thereafter. Figure 4 read with Table 16 provides an indication of the proposed additional ambient monitoring locations⁷.

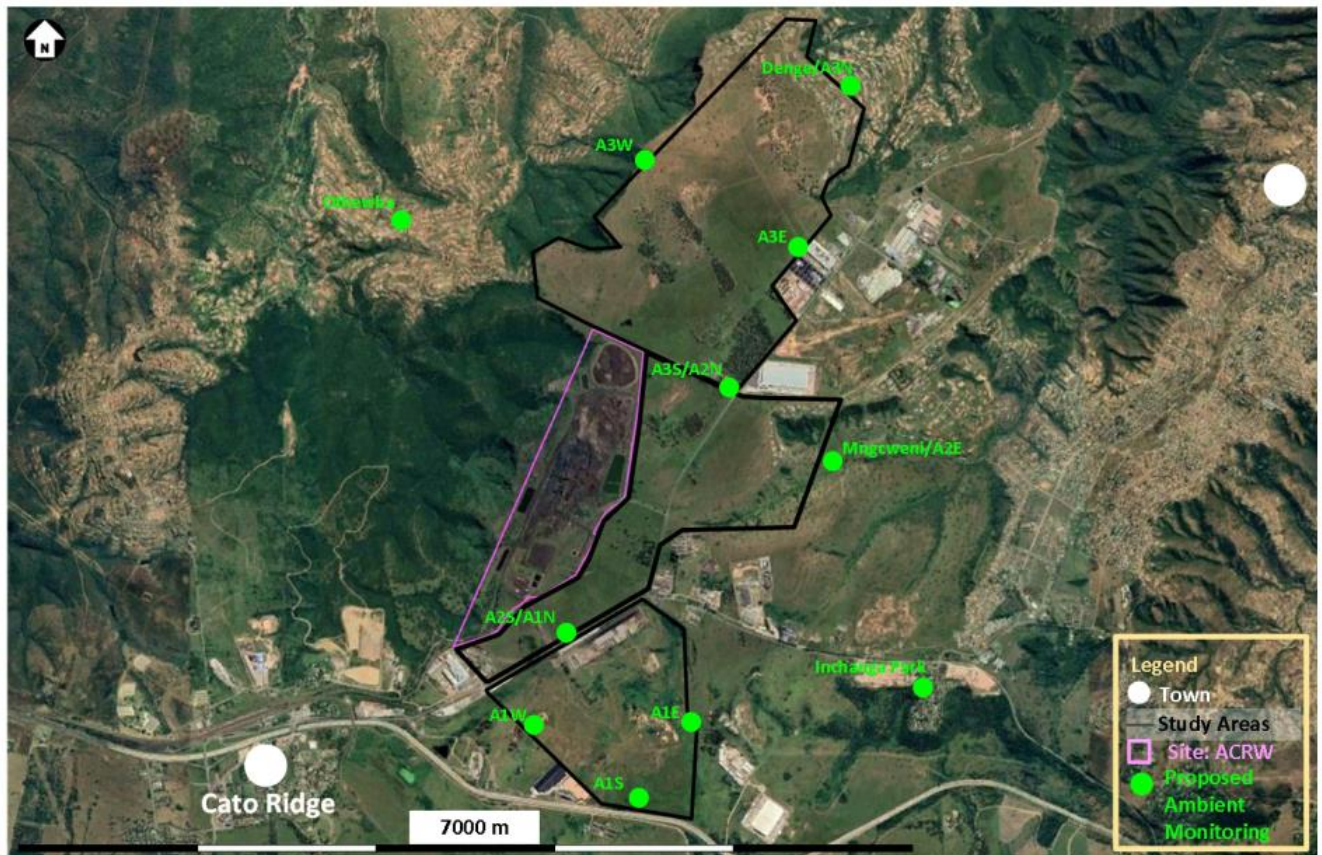


Figure 4: Proposed additional ambient air quality monitoring locations

Table 16: Proposed additional ambient air quality monitoring

Location Description/Reference	Proposed ambient monitoring
Othweba	DFO (SANS1137) - already included under ACRW monitoring PM10, PM2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
A3W (West of PDA3)	DFO (SANS1137) PM10, PM2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
Denge / A3N (North of PDA3)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
A3E (East of PDA3)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
A3S / A2N (South of PDA3 and North of PDA2)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
Mngcweni / A2E (East of PDA2)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)

⁷ Note that locations at Othweba and Inchanga are already included under ACRW monitoring.

Location Description/Reference	Proposed ambient monitoring
A2S / AIN (South of PDA2 and North of PDA1)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
A1E (East of PDA1)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
Inchanga Park	DFO (SANS1137) - already included under ACRW monitoring PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
AIS (South of PDA1)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)
A1W (West of PDA1)	DFO (SANS1137) PM 10, PM 2.5 (Alternative methods / Indicative low-cost sensor technology) NO2 (Alternative methods / Indicative low-cost sensor technology)

5.11.2 Fugitive dust: Increased Light Commercial Vehicle (LCV) during the Construction phase (All Phases)

5.11.2.1 Mitigation

- Manage site access and control movement on site.
- Practice dust suppression techniques.
- DFO monitoring.
- PM10/ PM2.5 monitoring.

5.11.3 Fugitive dust: Excavation work during the Construction phase (All Phases)

5.11.3.1 Mitigation

- Practice dust suppression techniques.
- DFO monitoring.
- PM1Q / PM2.5 monitoring.

5.11.4 Fugitive dust: Movement of material during the Construction phase (All Phases)

5.11.4.1 Mitigation

- Practice dust suppression techniques.
- DFO monitoring.
- PM1Q / PM2.5 monitoring.

5.11.5 Fine Fugitive dust: Stockpiles (if applicable – since mainly storage sites foreseen) during the Construction phase (All Phases)

5.11.5.1 Mitigation

- Practice dust suppression techniques.
- DFO monitoring.
- PM1Q / PM2.5 monitoring.

5.11.6 Additional noxious vehicle exhaust fumes during the Construction phase (All Phases)

5.11.6.1 Mitigation

- Manage vehicle fleet and movement of vehicles on sites.
- Given NO_x concentrations which could potentially impact neighbouring sensitive receptors it is recommended to consider alternative options to limit NO_x emissions from vehicles utilised.
- Limit the use of vehicles in poorly ventilated areas.
- Where possible/the practical layout of sites not to affect air quality to the extent whereby exceedances of standards could occur.
- Noxious fume monitoring, recommended for:
 - 1) the N, E, S and W boundaries of each development area;
 - 2) sensitive receptor(s) located near the development areas, such as Denge, Mngcweni, Inchanga Park and Othweba (N) and assess against relevant National Ambient Air Quality Standards;
 - 3) On-site (development areas) to assess compliance to Occupational Exposure.

5.11.7 Fine Fugitive dust: Stockpiles (if applicable – since mainly storage sites are foreseen) during the Operational phase (All Phases)

5.11.7.1 Mitigation

- Practice dust suppression techniques.
- DFO monitoring.
- PM₁₀ / PM_{2.5} monitoring.

5.11.8 Fine Fugitive dust: Movement of material (if applicable – since mainly storage sites are foreseen) during the Operational phase (All Phases)

5.11.8.1 Mitigation

- Practice dust suppression techniques.
- DFO monitoring.
- PM₁₀ / PM_{2.5} monitoring.

5.11.9 Fine Fugitive dust: Vehicle movement on gravel roads during the Operational phase (All Phases)

5.11.9.1 Mitigation

- Practice dust suppression techniques.
- Consider alternative techniques to reduce the extent to which vehicles are used to move material.
- DFO monitoring.
- PM₁₀ / PM_{2.5} monitoring.

5.11.10 The additional quantity of noxious vehicle exhaust fumes during the Operational phase (All Phases)

5.11.10.1 Mitigation

- Manage vehicle fleet and movement of vehicles on sites.
- Given NO_x concentrations which could potentially impact neighbouring sensitive receptors it is recommended to consider alternative options to limit NO_x emissions from vehicles utilised.
- Limit the use of vehicles in poorly ventilated areas.

- Where possible/practical layout of sites not to affect air quality to the extent whereby exceedances of standards could occur.
- Noxious fume monitoring, recommended for:
 - 1) the N, E, S and W boundaries of each development area;
 - 2) sensitive receptor(s) located near the development areas, such as Denge, Mngcweni, Inchanga Park and Othweba (N) and assess against relevant National Ambient Air Quality Standards;
 - 3) On-site (development areas) to assess compliance to Occupational Exposure.

5.11.11 Emission of primary pollutants: PM, PM10, PM2.5 and metals such as Mn (if applicable – since mainly storage sites are foreseen) during the Operational phase (All Phases)

5.11.11.1 Mitigation

- Implementation of adequate/very efficient abatement and mitigation technology to improve the control efficiency of Air Pollution Control Equipment (APCE) and reduce the pollutants of concern. The estimated required abatement efficiencies need to meet relevant regulations and by-laws.
- Without the implementation of control measures to prevent/limit the probability, duration, extent, and magnitude of uncontrolled emissions from point sources, the resulting significance could be high.
- Required to minimise the release of uncontrolled emissions to an absolute minimum since the impact thereof is significant.
- Uncontrolled releases need to be limited with an availability/utilisation of at least 99.5%, ideally 99.8% (in terms of production time) for the abatement at design/required efficiencies of better.
- Recommended that activities which could potentially be considered in any of the study areas should preferably not contribute further to levels of Mn in the airshed.
- With the implementation of control measures to prevent/ limit the probability, duration, extent and magnitude of uncontrolled emissions from point sources, the resulting significance will be extremely low as indicated.
- Monitoring of records of uncontrolled emissions which should include date, time, duration and production capacity at time.

5.11.12 Emission of gaseous pollutants: such as NOx (if applicable – since mainly storage sites are foreseen) during the Operational phase (All Phases)

5.11.12.1 Mitigation

- Implementation of adequate/very efficient abatement and mitigation technology to improve the control efficiency of Air Pollution Control Equipment (APCE) and reduce the pollutants of concern. The estimated required abatement efficiencies need to meet relevant regulations and by-laws.
- Without the implementation of control measures to prevent/limit the probability, duration, extent, and magnitude of uncontrolled emissions from point sources, the resulting significance could be high.
- Required to minimise the release of uncontrolled emissions to an absolute minimum since the impact thereof is significant.
- Uncontrolled releases need to be limited since they could lead/contribute to exceedances of the National Ambient Air Quality Standard/s.
- With the implementation of control measures to prevent/ limit the probability, duration, extent and magnitude of uncontrolled emissions from point sources, the resulting significance will be extremely low as indicated.
- Monitoring of records of uncontrolled emissions which should include date, time, duration and production capacity at time.

5.11.13 Fugitive dust: Increased Light Commercial Vehicles (LCV) during Decommissioning phase (All Phases)

5.11.13.1 Mitigation

- Manage site access and control movement on site.

- Practice dust suppression techniques.
- DFO monitoring.
- PM1Q / PM2.5 monitoring.

5.11.14 Fugitive dust: Movement of material during Decommissioning phase (All Phases)

5.11.14.1 Mitigation

- Practice dust suppression techniques.
- DFO monitoring.
- PM1Q / PM2.5 monitoring.

5.11.15 Fine Fugitive dust: Stockpiles (if applicable – since mainly storage sites foreseen) during Decommissioning phase (All Phases)

5.11.15.1 Mitigation

- Practice dust suppression techniques.
- DFO monitoring.
- PM1Q / PM2.5 monitoring.

5.11.16 An additional quantity of noxious vehicle exhaust fumes during Decommissioning phase (All Phases)

5.11.16.1 Mitigation

- Manage vehicle fleet and movement of vehicles on sites.
- Given NOx concentrations which could potentially impact neighbouring sensitive receptors it is recommended to consider alternative options to limit NOx emissions from vehicles utilised.
- Limit the use of vehicles in poorly ventilated areas.
- Where possible/practical layout of sites not affect air quality to the extent whereby exceedances of standards could occur.
- Noxious fume monitoring, recommended for:
 - 4) the N, E, S and W boundaries of each development area;
 - 5) sensitive receptor(s) located near the development areas, such as Denge, Mngcweni, Inchanga Park and Othweba (N) and assess against relevant National Ambient Air Quality Standards;
 - 6) On-site (development areas) to assess compliance to Occupational Exposure.

5.12 GREENHOUSE GAS EMISSIONS

5.12.1 Cumulative Climate Change Impact (All Phases)

5.12.1.1 Mitigation

- Reducing electricity consumption and reliance on non-renewable (coal-fired) energy- electricity consumption through, for example, installing renewable energy generation infrastructure on site (where possible).
- Improving access to public transport (where possible) and reducing private car trips through encouraging lift-sharing among tenants and workers.
- Where possible, source building materials that have a lower carbon footprint.
- Water-use efficiency initiatives should be implemented throughout the Project site to minimise the water treatment for consumption of wastewater (both relatively large users of electricity), and increase resilience to dry spells; and

- The project should monitor all GHG emissions through an extensive annual GHG inventory. This inventory should ideally cover both direct and indirect key emissions sources (including infrastructure, fuel-related and other material sources).

6 SUMMARY OF IMPACTS AND ASSOCIATED MITIGATION MEASURES

The following tables cover the construction activities and associated environmental impacts that will occur during the Proposed development.

The tables consider the expected impacts during the different phases of the project, as well as the mitigation measures and environmental management procedures required to effectively manage the expected impacts. The following sections are dealt with in the table:

- Section 6.1: Pre-construction and construction site environmental management
- Section 6.2: Materials
- Section 6.3: Waste
- Section 6.4: Surrounding properties
- Section 6.5: Flora, fauna, air quality, noise, water and other
- Section 6.6: Rehabilitation
- Section 6.7: Planning and engineering considerations

6.1 PRE-CONSTRUCTION AND CONSTRUCTION SITE ENVIRONMENTAL MANAGEMENT

Table 17: Pre-construction and construction site environmental management

ACTIVITY	ASPECT	POTENTIAL IMPACT	IMPLEMENTATION			MONITORING		
			RESPONSIBLE PERSON	MITIGATORY MEASURE (OBJECTIVES AND TARGET)	TIMEFRAME	RESPONSIBLE PERSON	FREQUENCY	PERFORMANCE INDICATOR
6.1.1 Engineering Design	All aspects listed in the EMPr	Incompatibility between the design and the receiving environment	Developer	Objective: To ensure the design of The Project considers environmental sensitivities. Target: Assimilate requirements of the EMPr in the design and construction management giving special attention to the environmental sensitivities identified by the EIA specialists.	During the tender, design and design review stages	Cato Ridge Development Company Limited in consultation with appointed specialists.	Throughout design phase	The design meets objectives and does not degrade the receiving environment.
6.1.2 Establishment of the construction site	Construction site	Construction activities infringing on no-go areas.	Developer, Contractor and ESA with the inputs from appointed specialists	Objective: Ensure the establishment of the construction site does not infringe on or damage/pollute the no-go (buffer zone) areas. Target: Adequately fence off all no-go areas according to the specialist reports conducted as part of the EIA process. Erect no-go signage on the fences of these areas. Ensure all appointed staff and visitors are aware of these areas.	Pre-construction phase	Developer, Contractor and ECO in consultation with appointed specialists.	Throughout the pre-construction phase until targets are met. Monitor during the construction phase.	No trespassing within or damage to the no-go areas.
6.1.3 Establishment of the construction site	Construction site	Undue damage to or loss of vegetation	Cato Ridge Development Company Limited, Contractor and ESA	Objective: To prevent and mitigate the undue damage or loss of natural vegetation outside the boundaries of The Project footprint. Targets: Site establishment shall take place in an orderly manner and all amenities shall be installed or be available before the onset of construction. Where such amenities are not available, chemical toilets shall be provided. A method statement is required from the Contractor that includes the layout of the site, management of facilities and wastewater management. A site plan of the construction site must be provided indicating waste areas, storage areas and placement of facilities. The Contractor shall inform all site staff of the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities. The Contractor shall supply sealable waste collection bins and all solid waste collected shall be disposed of at a registered waste facility. Certificates of disposal shall be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may solid waste be burned on site or illegally dumped. Refuse bins will be emptied and secured.	Pre-construction phase	Engineer and ECO	Once off, unless the site area changes in which case the method statement and layout plan must be updated.	Establishment of a construction site in compliance with objectives and no evidence of environmental degradation.

				The construction site office and other areas must be placed on already disturbed land as far as possible. Fences and security access must be maintained, throughout the project. Emergency and contact numbers of the contractors must be available and prominently displayed on a signage board that is clearly visible.				
6.1.4 Establishment of the construction site	Construction site	Loss of soil fertility	Contractor and ESA	Objective: Whilst establishing the construction site the footprint of disturbance is to be minimised thereby preventing the undue degradation and loss of soil. Targets: Protect stockpiles of topsoil and subsoil material with silt fences that should be maintained during the entire construction phase on site. Locate stockpiles outside of any buffer zones as indicated in the specialist reports and not on slopes with a gradient greater than 1:3. Identify and clearly demarcate existing infrastructure within the study area in order to avoid damage throughout the construction phase.	Design phase and site establishment	Engineer and ECO	Once-off	Established construction camp in compliance with objectives and no evidence of environmental degradation
6.1.5 Temporary closure of the construction site	Construction site	Potential impacts associated with the closure of the construction site.	Contractor and ESA	Objective: To limit potential impacts on the environment for periods during which the construction site is closed. Targets: Should the construction site be closed for a period of more than one week, a report on compliance will be lodged with the Engineer and Project Manager confirming the following: No persons allowed other than project employees. Minimal materials are kept stored. Materials will be stored in leak-proof, sealable containers or packaging. The store area is secure and locked. Fire extinguishers will be serviced and accessible. The area is secure from accidental damage through vehicle collisions, etc. Emergency and contact numbers of the contractor will be available and prominently displayed. Chemical toilets are emptied, kept hygienically clean and secured. 24-hour security will be on-site during this period.	Closure of construction site (for example over holiday breaks)	Engineer and ECO	Whenever the construction camp is closed for longer than a week.	Closure of the construction camp in line with the requirements of the EMP.
6.1.6 Construction of site buildings during site establishment	Materials used to construct site buildings	Soil pollution and permanent alternation to the receiving environment	Contractor and ESA	Objective: To ensure the material for site buildings, used by the Contractor during the construction of the project, are removable and to minimise the impacts of the construction of the buildings on the environment. Targets: No permanent structures will be permitted at the construction site. Temporary structures shall be founded on a platform, either subsoil or screed slab.	Site establishment	Engineer and ECO	Once off, unless the site area changes and/or new buildings are required, in which case additional inspections will be required.	On-site buildings constructed according to the requirements of the EMP.

				Buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. All temporary structures must be soundly built and not pose a danger to workers. All structure footprints are to be rehabilitated and landscaped after construction is complete.				
6.1.7 Operation of sanitation systems	Sanitation systems	Unpleasant odours on site. An inadequate number of latrines on site. Position of latrines. Mismanagement of wastewater.	Contractor and ESA	Objective: To ensure good sanitation systems and management throughout the construction period. Targets: Adequate toilets must be provided for all staff. Chemical toilets must be emptied/serviced on a regular basis to prevent them from overflowing. Proof of this must be provided to the ECO. A minimum of one toilet must be provided per 15 persons.	Pre-construction and site establishment	Engineer and ECO	Once off, unless the site area changes and/or new buildings are required, in which case additional inspections will be required.	Adequate toilets will be positioned at the right places as per the EMP and ECO. Absence of odours, erosion and build-up of detergents.
6.1.8 Vehicle parking. Storage of equipment.	Vehicle parking and parking area(s). Storage of equipment.	Pollution of soils. Disturbance of soils due to parking of vehicles outside of designated areas.	Contractor and ESA	Objective: Ensure vehicles are parked according to the specifications in the EMPr and that equipment is handled appropriately. Targets: No storage of vehicles or equipment will be allowed outside of the designated area. Drip trays or any form of oil-absorbent material must be placed underneath vehicles and equipment when not in use.	Throughout the construction period. Planning to be done during the site establishment phase.	Engineer and ECO	Whenever there are stationary vehicles or equipment present on site.	No incidents of soil pollution due to spills from stationary vehicles and equipment. No undue disturbance of soils. No incidents of vehicles being parked outside the designated parking area.
6.1.9 Servicing and washing of vehicles and machinery	Workshop and equipment storage areas	Water contamination. Soil contamination. Noise pollution.	Contractor and ESA	Objective: Ensure that the environment is not polluted by ensuring that service areas and wash bays for vehicles and machinery are made available and utilised. Targets: No servicing of equipment on site. Leaking equipment shall be repaired immediately or removed from the site to facilitate repair. All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site. The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site. Only emergency repairs shall be allowed on site and a drip tray shall be used to prevent oil spills. The contractor must ensure that delivery drivers and plant operators are informed of all relevant procedures and restrictions required to ensure compliance with this document. Noise levels to be maintained in compliance with OSH requirements. All vehicles and equipment must be well maintained to ensure that there are no oil or fuel leakages. The following shall apply:	Whenever servicing or maintaining vehicles or equipment throughout the construction period.	Engineer and ECO	Daily monitoring by ESA and monthly inspections by ECO.	Evidence of prescribed servicing and washing services. No incidents of soil or water contamination. No complaints from neighbours of noise pollution due to servicing and washing of vehicles.

				• All contaminated soil/yard stone shall be removed and placed in containers. • Contaminated material can be taken to one central point where bioremediation can be done. • A specialist Contractor shall be used for the bioremediation of contaminated soil where the required remediation material and expertise are not available on-site. • All spills of hazardous substances must be reported to the ECO.				
6.1.10 Personnel conduct	Personnel	Infringement of the EMPr requirements by personnel on site.	Contractor, ESA and labourers.	Objective: To ensure that personnel are adhering to the EMPr requirements. Targets: The Contractor will adhere to all requirements of the Occupational Health and Safety Act (Act 56 of 2004), including the drafting of a suitable Health and Safety Plan which will be implemented during the construction phase. All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Toolbox talks to include aspects of the EMPr, especially specialist mitigation measures. Warning signs must be placed on and around the site as per the Occupational, Health and Safety requirements. Adequate first aid services must be provided by the contractor. The contractor will be responsible for his own security arrangements and shall comply with all site security instructions. Basic fire-fighting equipment must be available on site. PPE to be provided and well maintained. All incidents should be reported to ECO, investigated, documented and kept in safety file.	Approved PPE must be issued to all employee's pre-construction but must be used for the duration the construction phase	Engineer and ECO	Daily monitoring by ESA and safety officers.	Personnel wearing proper safety uniform. Absence of trespassers on site

6.2 MATERIALS

Table 18: Handling Materials

ACTIVITY	ASPECT	POTENTIAL IMPACT	IMPLEMENTATION			MONITORING		
			RESPONSIBLE PERSON	MITIGATORY MEASURE (OBJECTIVES AND TARGET)	TIMEFRAME	RESPONSIBLE PERSON	FREQUENCY	PERFORMANCE INDICATOR
6.2.1 Transportation of materials	Material transport	Traffic congestions. Production of dust during transportation. Excessive noise.	Contractor and ESA.	Objective: To ensure that whilst the material is transported, it cannot be of negative influence on the surrounding environment. Target: The contractor should note that existing roads are sufficient to facilitate access to the new office site and that the following should be adhered to: Adequate and appropriate traffic warning signage must be erected where applicable, along transport routes and access roads. The Contractor shall take preventative measures e.g. screening, muffling (where possible), timing, and pre-notification of affected parties to minimise complaints regarding noise and vibration nuisance from construction activity sources. Fine materials such as sand must be covered during transportation. Appropriate response plans must be prepared by the contractor to ensure the fastest possible reaction to spills or accidents. Deliveries must be scheduled for off-peak hour traffic times where practical. All trucks and vehicles removing spoil from the site must have load areas and must be covered by a tarpaulin (plastic / synthetic sheets/covers) to prevent rocks and spoil from falling onto the road surfaces. Vehicle speeds on site should not exceed 20 km/hr. All drivers are to have licences for driving and operating the plant on site All road vehicles are to be road worthy.	Targets are to be implemented prior to the start of construction and continually implemented throughout the construction phase.	Engineer and ECO.	Throughout construction phase	Covering of material during transportation. No complaints were received. Emergency reaction plans (for spills/accidents) must always be readily available on-site.
6.2.2 Storage and handling of hazardous materials.	Hazardous material handling and storage.	Contamination of soil, water and groundwater by hazardous material. Inadequate remediation measures for spills.	Contractor and ESA	Objective: To ensure adequate protection of soil and soil remediation measures in case of spills. Targets: Hazardous materials – such as paint, cement, fuels, bitumen, fuel, oil, herbicides, battery acid or detergents – must be stored in sealed, lockable containers when not in use. A register shall be kept of all substances and be available for inspection at all times. Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. No decantation into unmarked containers or containers with incorrect labels. No decanted fuel is to be left unattended in the sun. When handling hazardous materials, the manufacturer's specifications must be complied with. The 16-point Material Safety Data Sheet is available on-site. Drip trays must be used when handling hazardous substances. No hazardous substance containers may be placed on the soil. All spills (minor and major) must be cleaned and remediated to the satisfaction of the ECO and ESA within 24 hours of occurrence. The contractor must ensure that there is a supply of absorbent material (e.g. Drizit) and clean-up materials readily available to absorb, breakdown and, where possible, encapsulate minor hazardous material spillages. No material may be stacked higher than 2m unless agreed to by the SE and Health and Safety Officer. All products are to be stored with compatibility in mind. Storage areas shall display the required safety signs depicting "No smoking", "No naked lights" and "Danger". Containers shall be clearly marked to indicate contents as well as safety requirements.	Construction period	Engineer and ECO	The duration of the construction period is dependent on the presence of hazardous material on site.	Storage of hazardous materials in sealed and lockable containers. No evidence of spills on site. Absorbent and clean-up material are readily available on site.

				The contractor shall supply a method statement to the engineer for approval for the storage of hazardous materials prior to site preparation. Appoint appropriate contractors to remove any residue from spillages from the site. Handling, storage and disposal of excess or containers of potentially hazardous materials shall be in accordance with the requirements of pertinent Regulations and Acts (e.g. Hazardous Substances Act, Number 15 of 1973; National Water Act, Number 36 of 1998.				
6.2.3 Storage of fuel	Storage areas	Contamination of soil by fuel. Inadequate remediation measures for spills.	Contractor and ESA	Objective: To ensure that there is optimum environmental protection (especially soil) from fuel spills. Targets: Fuel must be stored in above-ground storage tanks or sealed containers, contained within a bunded area with sump drainage. All bunds must be designed to contain at least 110% of the tank or drum storage capacity (this shall apply to above-ground storage, and include fuels). No drainage from fuel storage areas shall be permitted. Any other hazardous substances stored in bulk will require bunding.	Pre-construction phase and site establishment.	ECO	Once-off	Established fuel storage areas in compliance with the objectives of the EMPr.
6.2.4 Use of cement	Cement	Contamination of soil and surrounding environment. Decrease in ambient air quality.	Contractor and ESA	Objective: Ensure that the environment is protected from the cement that will be used on site. Targets: Cement must be delivered in sound and properly secured bags or in approved bulk containers, Cement products in bags must be stored in storage containers to be provided at the construction camp and should only be opened when needed. The storage facility and surrounding area must be swept and cleaned regularly as required to ensure that cement products do not pollute the surrounding environment. Cement bags are not to be burnt on site but should be disposed of at a registered hazardous waste disposal site, as mandated by the manufacturer and the applicable legislation. No concrete batching on bare soil.	As long as cement is in use on site.	ECO	Weekly ECO monitoring and monthly audits	Cement delivery, storage and use will be in line with the EMPr requirements.

6.3 WASTE

Table 19: Handling Waste

ACTIVITY	ASPECT	POTENTIAL IMPACT	IMPLEMENTATION			MONITORING		
			RESPONSIBLE PERSON	MITIGATORY MEASURE (OBJECTIVES AND TARGET)	TIMEFRAME	RESPONSIBLE PERSON	FREQUENCY	PERFORMANCE INDICATOR
6.3.1 Storage, removal and disposal of construction waste	Construction waste	Land pollution. Compaction of soil by rubble. The decreased aesthetic integrity of the site.	Contractor and ESA.	Objective: To ensure that waste is correctly stored and disposed of, decreasing the visual impact during the construction and post-construction period. Disposal of rubble and refuse in an appropriate manner. Minimise litigation. Minimise public complaints. Target: Surplus concrete, sludge, silt, rubble or any other construction waste may not be dumped indiscriminately on site but shall be disposed of in a registered waste landfill site or recycled as per the approved contractor's Waste Management Plan .	Waste bins/ skips must be available prior to construction. Removal of waste throughout the construction period.	ECO.	Throughout the construction phase and at a frequency agreed upon in the approved waste management plan.	Construction waste is stored, collected and disposed of as per the requirements of this EMPr.

				Concrete trucks shall not be washed on site after depositing concrete unless it is within an appropriate wash bay. Any spilt concrete shall be cleaned up immediately. Bins and containers/skips must be made available by the contractor for the storage of construction waste and the bins to be removed from the site as required. Temporary storage of construction waste will take place within the site, and within areas designated by the ECO and the Contractor according to the approved site layout plan. The Contractor will be responsible to remove and transport all construction waste material off-site to a registered waste disposal or recycling facility (proof of this as well as a copy of the site's Registration Permit, must be provided by the Contractor to the ECO). No burning of waste is permitted on site. No waste is permitted to pollute the watercourses.				
6.3.2 Storage, removal and disposal of domestic waste.	Domestic waste	Land pollution. Unpleasant odours. The decreased aesthetic integrity of the site.	Contractor and ESA	Objective: To ensure that waste is correctly stored and disposed of, decreasing the visual and possible environmental impact during the construction and post-construction period. Targets: The Contractor must supply sealable waste bins at the construction camp for the storage of domestic waste. Clearly marked waste bins are to be provided for the separation of waste according to the WMP. Recyclable waste, including glass, paper and plastic must be separated at the construction camp, stored and recycled, where economically feasible. Personnel must be informed about the necessity of using the waste drums. The Contractor must do site clean-ups of litter other than construction waste on a daily basis and dispose of it in the designated refuse bins provided. The contractor must ensure that general site-wide litter clean-up will occur at least once a week. The Contractor must dispose of all domestic refuse generated by his staff and Sub-Contractors on a weekly basis at a registered waste disposal facility. The Contractor must provide proof of this to the ECO in the form of a safe disposal certificate. Sealable waste drums should be provided in close proximity to all working areas during the construction of the new office building. The waste storage area must not be allowed to overflow with waste.	Waste bins/ skips must be available prior to construction. Removal of waste throughout the construction period. Regular removal of waste from waste storage area to registered disposal site.	Engineer and ECO	Waste bins/ skips must be available prior to construction. Throughout the construction phase and at a frequency agreed upon in the approved waste management plan.	Evidence of domestic waste stored, removed and disposed of according to the requirements indicated in this EMPr.
6.3.3 Storage, removal and disposal of hazardous waste	Hazardous waste	Soil and water pollution	Contractor and ESA	Objective: To ensure that soil and the rest of the surrounding environment on site are protected from hazardous waste.	Throughout the construction phase.	ECO	Old hydrocarbons and other hazardous materials must be removed on a regular	All mitigation measures with regard to Hazardous waste mentioned in the EMPr are implemented.

				Targets: The Contractor is required to refer to the Hazardous Substances Act No 15 of 1973 act to determine whether any substance (new or waste) stored on site is subject to controls contained within the act. All hazardous waste must be stored in sealed and suitably marked containers for removal to a registered hazardous waste disposal facility. Any oil spillage on site will be excavated to a depth of 150 mm and disposed of for removal to a registered hazardous waste disposal site. Excavated areas are to be refilled with suitable replacement material. Alternative in-situ remediation techniques could be used if approved by the ECO. Contaminated water must be stored in sealable marked containers and disposed of with other wastewater from the construction works. Refer and adhere to the approved Waste Management Plan as compiled by the Contractor and approved by the ECO.			basis (at least every 30 days).	
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6.4 SURROUNDING PROPERTIES

Table 20: Surrounding properties

ACTIVITY	ASPECT	POTENTIAL IMPACT	IMPLEMENTATION				MONITORING			
			RESPONSIBLE PERSON	MITIGATORY MEASURE (OBJECTIVES AND TARGET)		TIMEFRAME	RESPONSIBLE PERSON		FREQUENCY	PERFORMANCE INDICATOR
6.4.1 Use of existing roads	Access roads	Damage to access roads. Damage to environment Erosion.	Contractor and ESA.	Objective: To minimise damage to existing roads. Target: Care to be taken to prevent damage to existing access roads. Adhere to traffic signs and road markings. Ensure that open trucks are covered with tarpaulins (plastic liners) to ensure no transported materials fall onto the road surface.		Implement during site establishment and monitor throughout the construction phase.	ECO.	Daily		No claims from Landowners due to further damage on existing access roads. No damage visible on access roads



6.5 FAUNA, FLORA, AIR QUALITY, NOISE, WATER AND OTHER ENVIRONMENTAL ASPECTS

Table 21: Flora, fauna, air quality, noise, water and other

ACTIVITY	ASPECT	POTENTIAL IMPACT	IMPLEMENTATION			MONITORING		
			RESPONSIBLE PERSON	MITIGATORY MEASURE (OBJECTIVES AND TARGET)	TIMEFRAME	RESPONSIBLE PERSON	FREQUENCY	PERFORMANCE INDICATOR
6.5.1 Vegetation clearing	Vegetation	Damage to vegetation. Erosion and sedimentation.	Contractor and ESA.	Objective: Minimise damage to vegetation. Target: The objective of vegetation clearing is to trim, cut or clear the minimum number of trees and vegetation necessary for the safe construction and operation of the proposed Cato Ridge Land Development and Release Project No vegetation shall be pushed into heaps or left lying on the site for extended periods. Where possible, do not clear vegetation in areas where construction activities are only planned for a later period (i.e., implement a phased approach). All topsoil removed is to be stored for future use during rehabilitation.	Plan vegetation clearing according to construction timeframes during the pre-construction phase. The clearing is to be done during the construction phase as required.	ECO.	Weekly monitoring	No unnecessary loss of vegetation.
6.5.2 Vegetation clearing	Conservation and protection of flora	Unnecessary removal of flora. Removal of vegetative matter for firewood.	Contractor and ESA.	Objective: Minimise the extent of vegetation removal. Target: Only eradicated or trimmed-down vegetation matter may be removed from the site. No vegetative matter may be removed for firewood – this is strictly prohibited unless approved by the ECO (i.e. disposal of Eucalyptus and Wattle invasives may be considered). No open fires are permitted. No material storage or lay down is permitted under trees.	During the establishment of the construction site.		Weekly monitoring	No unnecessary loss of vegetation.
6.5.3 Protection and handling of possible fauna on site.	Protection of fauna	Intentional or unintentional killing of fauna on site. Loss of fauna due to habitat disturbance.	Contractor and ESA.	Objective: To ensure that fauna found on site are protected and not interfered with. Target: The contractor must ensure that the site is kept clean and free of rubbish that could potentially attract animal pests and that rubbish bins are scavenger-proof. The contractor must report problem animals or vermin to the ECO. Ensure that domesticated animals belonging to the local community are kept away from the construction works. The contractor may under no circumstances make use of pesticides or poison to control unwanted animals.	Throughout the construction and post-construction period.	ECO	Continuous	No evidence of domestic animals on site. The site is kept clean and does not attract pests or local fauna.

				Animals (incl. snakes, tortoises and lizards) must be removed from the site should they be directly threatened by vegetation clearance or construction activities. The ESA or ECO must be contacted for assistance in this regard. Snake handling must be done by an appropriately trained individual. Excavations and trenches must be inspected daily (first thing in the morning) to check whether any animals have been trapped. Any trapped animals must be removed and relocated to a safe location outside of the development footprint. In terms of fencing and movement of fauna, the following must be implemented: ▶ Small ground-level openings, 20-30 cm in height, should be kept clear in electrical fencing, at least at strategic places, to facilitate the movement of small mammals and reptiles to move through the site. ▶ Fencing (e.g., palisade) must provide an appropriate opening for animals to pass through – bars placed 20cm apart should provide sufficient space for the movement of small animals whilst deterring humans; and ▶ If not electrified, the bottom wire of the perimeter fence must be at least 15cm from the ground, 20cm if electrified (tortoises retreat into shells when shocked).				
6.5.4 Earthworks	Dust control	Air pollution	Contractor and ESA.	Objective: To reduce the generation of dust on the construction site. Target: Dust suppression is to be conducted during construction, or as complaints are received. The Contractor is to take appropriate measures to minimise the generation of dust as a result of excavation works (such measures include frequent spraying during low rainfall periods or by using chemical dust binding agents approved by the ECO).	Throughout the construction period.	ECO	During periods of low rainfall or as required by the ECO.	Dust is kept within the dust control regulatory levels on site.
6.5.5 Use of construction vehicles and equipment	Construction vehicles, plant and machinery.	Noise and vibration.	Contractor and ESA.	Objective: Noise levels are kept to a minimum on-site. Target: Should construction have to continue after hours, all affected stakeholders must be notified. All machinery and equipment must be maintained in good working order and fitted with approved and specified muffler systems (where possible). The contractor shall have updated complaints register on-site.	Throughout the construction period.	Engineer and ECO	Continuous	No complaints were received from affected communities/stakeholders.
6.5.6 Water use and protection of the watercourse	Water management	Water wastage. Pollution of the watercourse. Degradation of the	Contractor and ESA.	Objective: To prevent the pollution of water, any long-term degradation of the area's watercourses and the unnecessary wastage of water. Target: Comply with all requirements of the approved WUL and aquatic assessments.	Construction phase	Engineer and ECO	Continuous when these activities are taking place.	Activities undertaken near watercourses must be in-line with and consider the specified environmental controls.

		downstream water resource.		Maintain all required buffer zones as per specialist assessments. During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g., including ensuring that construction equipment is well maintained, and drip trays must be used at all times. The use of silt fences is more important during summer months (rainy seasons) and would require more regular maintenance during this time. Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e., sandbags or geotextile fabric, to prevent sand and rock from entering the watercourses. Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows. All water used on site must be done so sparingly. Toolbox talks must include the conservation of water. Avoid unnecessary vehicle crossings and access into the watercourse. Any dewatering that needs to be done from excavated areas during the construction phase should be released into a silt bay that is maintained in order to trap and remove sediments before they enter the watercourse habitat.				
6.5.7 Protection of heritage resources	Heritage resources	Damage to heritage resources on site.	Contractor and ESA.	Objective: To prevent any damage to heritage resources on site. Target: In the event that any sub-surface heritage resources or graves are unearthed, all work has to be stopped until an assessment as to the significance of the site (or material) in question has been made by a heritage practitioner. No archaeological material that has been uncovered may be removed. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply. If human remains are uncovered, or previously unknown graves are discovered, a qualified archaeologist needs to be contacted and an evaluation of the finds made. If the remains are to be exhumed and relocated, the relocation procedures as accepted by SAHRA need to be followed. If any archaeological material is uncovered during the course of development, then work in the immediate area should cease. The find will need to be reported to SAHRA or an archaeologist. If any area that contains stone artefacts in reasonable numbers (e.g., more than 10 within a few metres of one another) or in high concentrations is noted during the proposed developments this should be inspected by an archaeologist prior to any disturbance..	Continuous monitoring throughout the construction phase.	ECO	Daily monitoring by ESA and weekly inspections by ECO	No damage to heritage resources on site.

6.6 REHABILITATION

Table 22: Rehabilitation

ACTIVITY	ASPECT	POTENTIAL IMPACT	IMPLEMENTATION			MONITORING		
			RESPONSIBLE PERSON	MITIGATORY MEASURE (OBJECTIVES AND TARGET)	TIMEFRAME	RESPONSIBLE PERSON	FREQUENCY	PERFORMANCE INDICATOR
6.6.1 Rehabilitation of disturbed areas	Rehabilitation	The visual impact of construction sites due to poor or no rehabilitation. Risks of erosion and sedimentation of watercourse due to poor or no rehabilitation. Potential dust impact due to poor or no rehabilitation.	Contractor and ESA.	Objective: To ensure adequate rehabilitation of the entire construction site upon completion of construction activities. Target: Completed areas are to be rehabilitated as soon as possible by following a phased approach. Rehabilitated areas are to be demarcated as no-go areas to prevent further disturbance during the construction phase. Indigenous species are to be used where feasible, especially when considering the planting of new trees. Where indigenous species are not considered, the contractor shall ensure that, at a minimum, the area is rehabilitated back to its original state. All waste, storage areas, bunds, toilets, temporary roads, buildings, etc. shall be removed from the site and legally and appropriately disposed of.	Implement during the construction phase as and when sections of the works are completed.	Engineer and ECO.	Daily	The Precinct area was adequately rehabilitated after construction completion. No complaints from the Project Company or stakeholders.



6.7 PLANNING AND ENGINEERING CONSIDERATIONS

Table 23: Planning and Engineering Considerations

ACTIVITY	ASPECT	POTENTIAL IMPACT	IMPLEMENTATION			MONITORING		
			RESPONSIBLE PERSON	MITIGATORY MEASURE (OBJECTIVES AND TARGET)	TIMEFRAME	RESPONSIBLE PERSON	FREQUENCY	PERFORMANCE INDICATOR
6.7.1 Construction activities	Existing infrastructure	Disruption of services, damage to installations, damage or loss of the plant.	Contractor and ESA.	Objective: To prevent disruption or damage to existing infrastructure or services. Target: Telephone lines, power lines and fibre lines shall be identified during the construction operations. Possible known pipelines must be considered during planning and construction. Where pipelines are found, the depth of the pipes under the surface shall be determined to ensure that proper protection is afforded to such structures. Repairs to any damaged pipelines shall be prioritised and undertaken as soon as possible. All existing access roads used for construction purposes shall be maintained at all times to ensure that neighbours have free access to and from their properties. Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect.	Prior to construction and during construction.	Engineer and ECO.	Continuous	No unplanned disruptions of services No damage to any plant or installations. No complaints from authorities or Landowners regarding disruption of services. No litigation due to losses of plant, or installations.



7 OPERATIONAL PHASE

The operational phase commences when the proposed development is being used for its intended purpose i.e., light industry, warehousing, distribution and logistics precinct. It is possible that there will be a period in the project life cycle where the construction and operational phase will overlap. This phase will include ongoing operation, monitoring and maintenance of the precinct, as well as continuing environmental management requirements (e.g., removal of alien and invasive vegetation).

It is likely that many of the individual erven will be developed according to various authorisations and permits that are specific to each of those individual developments. However, the management plans for those developments must take into consideration the impacts and mitigations identified in the preceding chapters of this EMPr.

The management of common areas during the operational phase will likely fall under the control of a Property Owners Association or similar governing body whose responsibility will be to ensure that the mitigations identified in this EMPr are implemented throughout the lifetime of the precinct.

7.1 EROSION CONTROL

The areas surrounding the sites, particularly the watercourses must be monitored for signs of erosion and remedial actions implemented where required. The erosion management specifications described under the construction phase EMPr must be fully implemented, where applicable.

7.2 WASTE MANAGEMENT

The incorrect management of solid waste can result in the pollution of soil, groundwater, and the general environment. Windblown litter can contribute to negative visual impacts and if consumed by grazing animals could result in fatality. In addition to the waste management methods discussed above, the following waste management practices must be implemented during the operational phase:

- Provide adequate scavenger-proof waste bins at the facility.
- Set up a system for regular waste removal using accredited service providers and dispose at an approved facility – preferably weekly.
- All solid and liquid waste must be removed from the operational areas and not discarded in the natural vegetation/veld.
- Minimise waste by sorting wastes into recyclable and non-recyclable waste streams (an independent contractor can be appointed to conduct this recycling if practical).
- No waste may be buried or burned under any circumstances.
- Hazardous waste must be removed from the site by an approved service provider e.g., used oil – certificates of safe disposal should be kept on record.
- No hazardous waste may be spoiled at the facility.
- A housekeeping team should be appointed to regularly maintain the litter and rubble situation in the facility; and
- Littering by the employees and visitors shall not be allowed under any circumstances.

8 DECOMMISSIONING PHASE

It is highly unlikely that the facility would be decommissioned and returned to pre-construction conditions, and this has not been considered in the planning of the project. It is anticipated that The Project will continue for as long as the light industrial and logistics precinct is sustainable and, given its alignment with long-term forward-planning policies, this is expected to extend in perpetuity.

Decommissioning refers to the discontinuation of the light industrial and logistics precinct and the removal of all associated infrastructure. This would entail the dismantling and removal of all bulk infrastructure such as roads, stormwater, water and wastewater pipes as well as electrical supply. Rehabilitation of the site to a suitable end use would also form part of the decommissioning phase and would be associated with the decommissioning of the individual sites and structures yet to be developed as part of the precinct. However, it is highly unlikely that the facility would be demolished and returned to pre-construction conditions.

A Closure Plan for decommissioning is not applicable to this project as it is not anticipated that the proposed project will be closed. In case there is a need to close the development, a closure plan should be developed at the time of closure. This would likely take place during the closure of the entire development footprint, comprising all infrastructure authorised as part of this development as well as possible future authorisations for individual developments within the precinct. All the relevant authorisations relating to closure should be granted before closure activities commence. Any closure plan developed should take into consideration all impacts and proposed mitigations identified in this EMPr and subsequent authorisations and should ensure the ongoing protection of all identified no-go areas and areas demarcated for protection or conservation.

Note, a 2Ml onsite modular wastewater treatment plant is proposed to service the project, until such time a new municipal trunk sewer line and associated municipal wastewater treatment works upgrade is installed (which is assumed to be available from 2032 onwards). Once municipal infrastructure capacity has increased, the onsite modular wastewater treatment plant will be decommissioned. The legal requirements for the decommissioning of the onsite modular wastewater treatment plant will need to be determined at the time, and the relevant legal processes followed.

9 PLANS, PERMITS AND PROGRAMMES

Several plans, permits and programmes may be required throughout the project lifecycle. The requirements for these will be determined throughout the environmental impact assessment process through consultation with the authorities and may require amendments as the project proceeds. These have been briefly described below as follows.

- Permits:
 - Water use license/registration.
 - Protected Species
 - Heritage Permits for demolition of infrastructure older than 60 years.
- Plans:
 - Alien Invasive Management Plan
 - Rehabilitation and revegetation Plan
 - Plant Rescue and Protection Plan
 - Animal Rescue and Protection Plan
 - Open Space Management Plan
 - Stormwater Management Plan
 - Fire Management Plan
 - Erosion Management Plan
 - Emergency Response Plan
 - Heritage Chance Finds Procedure
 - End-users must develop and implement an Employment policy.
 - End-users must develop a local Procurement plan.
 - End-users must develop a Skills development plan.
 - End-users must develop Community and employee health and safety plan.
 - End-users must develop an influx management plan.

The plans are further discussed in section 108 below.

- Programmes
 - Environmental Awareness Programme.
 - End-users to developing an employee skills database and a training programme (accredited and the training providers must be registered with the relevant Sector Education and Training Authority (SETA))

9.1 PERMITS

9.1.1 Water Use Authorisation

Section 21 of the National Water Act (Act 36 of 1998) recognises water uses that require authorisation by DHSWS before they commence. Construction of infrastructure within 32m of a drainage line will likely be required for the associated roads and Water Use License Application (WULA) is therefore required in terms of Section 21 (c) and (i). Alternately, water use may also be generally authorised in terms of Section 39 of the Act if the water use complies with conditions set out in the specific General Authorisation which has been published in a Government Gazette. The General Authorisation for water uses as defined in Section 21(c) or (i) issued under GN 509 of 26 August 2016 defines the “regulated area of a watercourse” as:

- The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam.
- In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse; or
- A 500 m radius from the delineated boundary (extent) of any wetland or pan.

This requires that all activities undertaken within these regulated areas would have to be authorised in terms of this General Authorisation mentioned above.

Applications for WUL have been submitted and are currently being considered by the Competent Authority. No water use may begin without the appropriate authorisation.

9.1.2 Permit for protected species.

It is important that any removal of indigenous vegetation and trees be managed according to the National Environmental Management: Biodiversity Act, Act 10 of 2004 (NEM: BA) to ensure that the proper procedures are followed when removing or damaging vegetation which could potentially be protected species. Any plants or animals listed as protected that are found within the site will require respective permits for removal/relocation prior to construction.

A number of species are protected by the KwaZulu-Natal provincial Nature Conservation Ordinance (No 15 of 1974). These plants may not be disturbed, damaged, destroyed or relocated without permit authorization from the provincial conservation authority Ezemvelo KwaZulu-Natal Wildlife (EKZNW). Three species, namely Sensitive Species 649 (Vulnerable), *Dierama pallidum* (Vulnerable) and *Boophone disticha* (Least Concern but Declining due to medicinal exploitation), must be located and a permit obtained for relocation (including any other protected species) and any additional species found by a botanist. A search and rescue (plant relocation) must be undertaken by a qualified botanist in all footprint areas plus 20m from the footprint edge.

9.2 MANAGEMENT PLANS

9.2.1 Alien Invasive Management Plan

9.2.1.1 Purpose

The purpose of the Cato Ridge Alien Plant Management Plan is to provide a framework for the management of alien and invasive plant species during the operation of the construction and operation of the precinct. The broad objectives of the plan include the following:

- Ensure alien plants do not become dominant in parts or the whole site through the control and management of alien and invasive species presence, dispersal & encroachment.
- Initiate and implement a monitoring and eradication programme for alien and invasive species.
- Promote the natural recovery and re-establishment of indigenous species where possible in order to retard erosion and alien plant invasion.

9.2.1.2 Problem background and legislative context

Alien plants require management because they replace indigenous vegetation leading to loss of biodiversity and change in landscape function. Potential consequences include loss of biodiversity, loss of grazing resources, increased fire risk, increased erosion, loss of wetland function, impacts on drainage lines, increased water use etc. In recognition of these impacts, South Africa has legislation in place which requires landowners to clear or prevent the spread of certain declared weeds from their properties.

NEMBA provides the invasive status classification, as outlined in the Alien and Invasive Regulations and Species list (2014), for all identified alien invasive plant species. These plants can be classified as Category 1a, 1b, 2 or 3 species. The description of the abovementioned classifications are:

Category 1a plants

Category 1a Listed Invasive Species are those species listed in terms of section 70(1)(a) of NEMBA as species which must be combatted or eradicated.

A person in control of a Category 1a Listed Invasive Species must-

- comply with the provisions of section 73(2) of NEMBA;
- immediately take steps to combat or eradicate listed invasive species in compliance with sections 75(1), (2) and (3) of NEMBA; and
- allow an authorised official from the Department to enter onto land to monitor,

Category 1b plants

Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of NEMBA as species which must be controlled.

A person in control of a Category 1 b Listed Invasive Species must control the listed invasive species in compliance with sections 75(1), (2) and (3) of the Act.

- If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.
- A person must allow an authorised official from the Department to enter the land to monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of the Act.

Category 2 plants

Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of NEMBA as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be.

- Unless otherwise indicated in the Notice, no person may carry out a restricted activity in respect of a Category 2 Listed Invasive Species without a permit.
- A landowner on whose land a Category 2 Listed Invasive Species occurs or person in possession of a permit, must ensure that the specimens of the species do not spread outside of the land, or the area specified in the Notice or permit.
- If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.
- Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occur outside the specified area, must, for purposes of these regulations, be considered to be a Category 1 b Listed Invasive Species and must be managed according to Regulation 3 of NEMBA.
- Notwithstanding the specific exemptions relating to existing plantations in respect of Listed Invasive Plant Species published in Government Gazette No. 37886, Notice 599 of 1 August 2014 (as amended), any person or organ of the state must ensure that the specimens of such Listed Invasive Plant Species do not spread outside of the land over which they have control.

Category 3 plants

Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.

- Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3 of NEMBA.
- If an Invasive Species Management Programme has been developed in terms of section 75(4) of NEMBA, a person must control the listed invasive species in accordance with such programme.

9.2.1.3 Ecological context

Alien species are adept at taking advantage of disturbance and many of their traits are linked to this ability. This usually includes the ability to produce large amounts of seed or being flexible in terms of their size, growth form or reproductive strategy. Alien plant control strategies therefore need to focus on these key attributes while management practices need to ensure that they do not create circumstances under which alien species are encouraged or can thrive. Perhaps the most important aspects in this regard are minimizing disturbance and ensuring the retention and recovery of indigenous vegetation as far as possible.

While the site has a number of alien species it is not possible or practical to prevent further alien species from entering the site as seed or spreading into disturbed areas from existing localized infestations. As such, some alien infestation is almost certain to occur, at least in some places and by some species. The disturbance created during construction will render the site vulnerable to invasion for some time thereafter and it is likely that many alien species from the local species pool will invade the site during or immediately after construction.

In the short-term, soil disturbance is likely to be the dominant driver of alien invasion at the site. While in the long-term, the distribution of runoff is likely to be a key driver as those areas which receive water will be wetter and likely to contain a higher alien abundance. As disturbance is the major initial driver of alien species invasion, keeping the disturbance footprint to a minimum is a key element in reducing alien invasion risk and severity. Wherever possible, the indigenous vegetation should be left intact as this will significantly reduce the likelihood of alien invasion as well as other degradation problems such as erosion.

Certain habitats and environments are more vulnerable to alien plant invasion and are likely to bear the brunt of alien plant invasion problems at the site. In addition, construction activities and changes in water distribution at the site following construction are also likely to increase and alter the vulnerability of some parts of the site to alien plant invasion. Areas at the site which are likely to require specific attention include the following:

- Wetlands and drainage lines
- Cleared and disturbed areas such as road verges, areas of cut and fill along roads and construction footprints etc.
- Construction camps and lay-down areas which are cleared or are active for an extended period.
- Areas which receive runoff from roads and other hardened areas.

General Clearing and Guidance Principles

- Alien control programs are long-term management projects and should include a clearing plan which includes follow-up actions for the rehabilitation of cleared areas. Alien problems at the site should be identified during pre-construction surveys of the development footprint. This may occur simultaneously with other required searches and surveys. The clearing plan should then form part of the pre-construction reporting requirements for the site.
- The plan should include a map showing the alien density & indicating the dominant alien species in each area.
- Lighter-infested areas should be cleared first to prevent the build-up of seed banks.
- Pre-existing dense mature stands ideally should be left for last, as they probably won't increase in density or pose a greater threat than they do currently.
- Collective management and planning with neighbours may be required in the case of large woody invaders as seeds of aliens are easily dispersed across boundaries by wind or water courses.
- All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing.

Clearing Methods

- Different species require different clearing methods such as manual, chemical or biological methods or a combination of both.
- However, care should be taken so that the clearing methods used do not encourage further invasion. As such, regardless of the methods used, disturbance to the soil should be kept to a minimum. Fire is not a natural phenomenon in the area and fire should not be used for alien control or vegetation management at the site.
- The best practice clearing method for each species identified should be used. The preferred clearing methods for most alien species can be obtained from the Working for Water Website. <http://www.dwaf.gov.za/wfw/Control/>

Use of Herbicides for Alien Control

Although it is usually preferable to use manual clearing methods where possible, such methods may create additional disturbance which stimulates alien invasion and may also be ineffective for many woody species which re-sprout. Where herbicides are to be used, the impact of the operation on the natural environment should be minimised by observing the following:

- Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control.
- All care must be taken to prevent contamination of any water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, products and spray mixtures.
- Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable site.

- To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.
- Coarse droplet nozzles should be fitted to avoid drift onto neighbouring vegetation.
- The appropriate health and safety procedures should also be followed regarding the storage, handling and disposal of herbicides.

9.2.1.4 Alien management actions and activities

In order to maintain the site free of alien weeds and trees, the following plan should be implemented during construction and operation.

Construction Phase Activities

The following management actions are aimed at reducing soil disturbance during the construction phase of the development, as well as reducing the likelihood that alien species will be brought onto the site or otherwise encouraged.

Construction Phase Actions/Activities	Frequency
The ECO is to provide permission prior to any vegetation being cleared for development.	Ad Hoc
Clearing of vegetation should be undertaken in stages or sections as the work front progresses – mass clearing should not occur unless the cleared areas are to be surfaced or prepared immediately afterwards.	Weekly
Where cleared areas will be exposed for some time, these areas should be protected with packed brush, or appropriately battered with fascine work. Alternatively, jute (Soil Saver) may be pegged over the soil to stabilise it or stabilised via other suitable means.	Weekly
Cleared areas that have become invaded can be sprayed with appropriate herbicides provided that these are such that break down on contact with the soil. Residual herbicides should not be used.	Monthly
Although organic matter is frequently used to encourage regrowth of vegetation on cleared areas, no foreign material for this purpose should be brought onto site. Brush from cleared areas should be used as much as possible. The use of manure or other soil amendments is likely to encourage invasion.	Weekly
Clearing of vegetation is not allowed within 32 m of any wetland, 80 m of any wooded area, within 1:100-year floodlines, in conservation servitude areas or on slopes steeper than 1:3, unless permission is granted by the ECO for specifically allowed construction activities in these areas. The work area should be clearly marked with construction or similar tape to demarcate the area to which vegetation disturbance and construction activity are to be confined.	Weekly
Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. (Particular attention must be paid to imported materials such as building sand or dirty earth-moving equipment.) Stockpiles should be checked regularly and any weeds emerging from material stockpiles should be removed.	Weekly
Alien vegetation regrowth in areas disturbed by construction must be controlled throughout the entire site during the construction period. The alien plant removal and control methods used should adhere to best practices for the species involved. Such information can be obtained from the Working for Water website.	Monthly
Pesticides may not be used. Herbicides may be used to control listed alien weeds and invaders only	Monthly
Clearing activities must be contained within the affected zones and may not spill over into demarcated No Go areas. Wetlands and other sensitive areas should remain demarcated with appropriate fencing or hazard tape and signage indicating their no-go status posted. These areas are no-go areas (this must be explained to all workers) that must be excluded from all development activities.	Daily

Monitoring Actions - Construction Phase

The following monitoring actions should be implemented during the construction phase of the development.

Monitoring Action	Indicator	Frequency/Period
Document alien species present at the site	List of alien plant species	Pre-construction

Document alien plant distribution	Alien plant distribution map	Bi-annually
Document & record alien control measures implemented	Record of clearing activities	Bi-annually
Review & evaluation of control success rate	The decline in documented alien abundance over time	Bi-annually

Operational Phase Activities

The following management actions are aimed at reducing the abundance of alien species within the site and maintaining non-invaded areas clear of aliens.

Operational Phase Action/Activity	Frequency
Surveys for alien species should be conducted regularly. Every 6 months for the first two years after construction and annually thereafter. All aliens identified should be cleared.	Every 6 months for 2 years and annually thereafter
Where areas of natural vegetation have been disturbed by construction activities, revegetation with indigenous, locally occurring species should take place where the natural vegetation is slow to recover or where repeated invasion has taken place following disturbance.	Biannually, but revegetation should take place at the start of the rainy season
Areas of natural vegetation that need to be maintained or managed to reduce plant height or biomass, should be controlled using methods that leave the soil protected, such as using a weed-eater to mow above the soil level.	When necessary
No alien species should be cultivated on-site. If vegetation is required for aesthetic purposes, then non-invasive, water-wise locally occurring species should be used.	When necessary

Monitoring Actions - Operational Phase

The following monitoring actions should be implemented during the operational phase of the development.

Monitoring Action	Indicator	Frequency/Period
Document alien plant distribution and abundance	Alien plant distribution map	Annually
Document & record alien control measures implemented	Records of control measures and their success rate. A decline in alien distribution and cover over time at the site	Annually
Document rehabilitation measures implemented, and success achieved in problem areas	The decline in vulnerable bare areas over time	Annually

9.2.1.5 Recommended Alien Plant Clearing and Control Protocols

- The appropriate alien management strategy pertinent to the situation/environment should be identified and implemented.
- The Alien Plant Management Plan for alien vegetation includes three phases:
 - **Initial control:** drastic reduction of the existing population.
 - **Follow-up control:** reduction of seedlings, root suckers and coppicegrowth.
 - **Maintenance control:** sustain low alien plant numbers/density with low annual costs. At this phase, alien plants must no longer be considered a problem. Monitor the situation two-three times each year (spring, mid- summer and autumn) to avoid alien plant re-infestation, spread and densification, and thereby avoid increased control costs.

Initial Control

- Fell trees - control stumps - plant grass.

- Fell trees, treat stumps, remove wood and if necessary, rehabilitate. This strategy is suitable where infestations are easily accessible and can be harvested (i.e., for firewood, charcoal, building materials, and mulch production). It is also suitable for trees that need removal for utility or aesthetic purposes or where they pose a potential hazard to waterways, building structures, etc.
- Control Method for trees: Use chainsaws, bow-saws, brush cutters or cane knives to fell trees and saplings. Stump height should be less than 15 cm. Apply a registered herbicide mix with hand sprayers, paint brushes or knapsack sprayers at low pressure, using solid cone nozzles. Use a suitable dye to ensure that stumps are not missed.
 - **Cut stump treatment:** Apply the recommended herbicide mixed in water to the cut surface of the stumps. Do NOT spray the sides of stumps. Apply herbicide mix up to one hour after felling or the cut wood will seal.
 - **Total Stump treatment:** Apply the recommended herbicide mixed in diesel to the cut surface, down the sides of stumps and to any exposed roots. The herbicide mix can be applied even several days after felling. Ensure herbicide can be mixed with diesel.
 - **Stump treatment with herbicide plugs:** After felling, make holes in the stumps and insert plugs containing the herbicide, which is released into the stumps.
- Control method for seedlings, saplings and coppice: In a mixed-age stand, where there are young plants and coppice growth, cut the plants with a brush cutter and treat the stumps. Hand-pull seedlings. Do not spray foliage as many plants may be damaged during felling and may not absorb enough of the herbicide for effective control. Untreated plants can be controlled with foliar herbicide during follow-up work.
- Disposal of brushwood: Where wildfires are a potential hazard, spread out the brushwood evenly over a large area. Avoid large heaps as this is a fire hazard and burning will cause a breakdown of the soil structure. Trees that cannot be utilised should be controlled standing to avoid burning large amounts of wood lying on the soil surface.
- Rehabilitation: Sow grass and/or shrubs in the bare soil around the stumps immediately after the first reliable rains. Spread brushwood over the buried seed to aid seedling establishment. Brushwood can be used as fences/barriers and pegged to stabilise slopes where necessary.
- **Alien shrubs less than 1 m tall**
 - A foliar application of a registered herbicide is required.
 - When dense seedling growth of uniform height is present use knapsack sprayers with flat fan nozzles.
 - Use solid cone nozzles for seedlings of uneven height, coppice growth, rootsuckers and short saplings.
 - Rehabilitate cleared areas with locally occurring species if necessary.
- **Alien shrubs taller than 1 m**
 - **Mechanical Control pre-treatment:** Where shrubs are taller than 1.5 m, the height must be reduced by cutting, using sharpened hoes, cane knives or motorised brush cutters. For large areas of dense growth, use a tractor-mounted gyro-mower (set as low as possible) after slashing or cutting plants, either treat the freshly cut stumps or allow re-growth to knee height and then spray with a suitable registered herbicide.
 - **Cutting for stump treatment:** This is suitable for low - medium-density infestations but is usually not practical for high-density infestations. Slash plants below 15 cm in height for stump application. Control the stumps immediately after cutting the plants. Stump application is best during the active growing season.
 - **Cutting from coppice treatment:** This is suitable for medium-high-density infestations. Slash plants at a convenient height (e.g., knee height for foliar application to coppice re-growth. Cutting dense plants is good winter work but is tiring so must be well organised. Spray coppice re-growth during the active growing season, when there is enough leaf cover to absorb the herbicide.
 - **Flattening:** Roll empty 200L metal drums or place large pieces of corrugated iron to make paths through dense thickets of plants (e.g., Bramble). This increases access to foliar or stump applications.
 - **Cut pathways:** This increases access to control work.
 - **Mechanical uprooting:** Uprooting of shrubs with mattocks results in soil disturbance, especially where large plants are present in dense thickets. Use only where not susceptible to erosion or where soil can be stabilised effectively.

- **Disposal of small amounts of cut material:** small amounts of cut top growth material do not impede access for follow-up control work. Leave the material to act as a mulch and to decompose or spread over planted grass seed to aid seedling establishment. This adds organic material to the soil.
- **Disposal of large amounts of cut material:** Cut the plants and use long poles/branches to roll the material away from stumps. Where cut material hampers access for follow-up control, roll into heaps and burn. Alternatively, spread large amounts of cut material over a large area for a cool burn. This avoids hot intense fire that would destroy the soil surface. Burn during the wet season for a cooler burn.

Rehabilitation: Avoid sowing on compacted soil or soil with a 'crust' as the seed will be washed away after the first rains. In such cases light soil disturbance is necessary e.g., using rakes for broadcast sowing or sharp-pointed hoes for row sowing. Sow suitable grass species on bare soil. Cover the buried seed with small amounts of cut top growth material to aid grass establishment. The material retains moisture in the soil, traps soil after heavy rains, and by rotting contributes organic material to the soil to aid seedling establishment.

9.2.1.6 Chemical control of alien herbs

- There are many herbaceous aliens (soft/non-woody) species present and likely to occur sporadically throughout the operational phase of the development.
- Alien herbs are called *broadleaf weeds*, and some have pre- and post-emergent herbicides registered for their control.
- However, where alien herbs are associated with woody alien plants, herbicides registered for control of woody aliens are often also used for control of broadleaf weeds.
- Alternatively, glyphosate is used, as this is often registered for both woody and non-woody species. Glyphosate is a post-emergent (foliar-applied) herbicide that is inactivated by soil.

Rehabilitation: Alien herbs usually occur in disturbed areas, where rehabilitation is not generally a high priority. However, in some situations, rehabilitation with grass or shrubs is required for the control of alien herbs. However, only indigenous grasses and/or shrubs growing in the study area should be used for such rehabilitation.

Perennial grasses are often planted after a disturbance to stabilise the soil and suppress alien herbs. Alternatively, creeping species (such as *Cynodon dactylon*) have good soil binding ability to prevent erosion. Planting a quick-growing grass on bare soil results in a dense rapid cover that successfully competes with establishing alien herbs.

Follow-up control

Follow-up control of alien seedlings, saplings and coppice re-growth is essential to achieve and sustain the progress made with initial control work. If this phase is neglected, the cleared area will soon become infested with dense alien vegetation again, arising either from re-invasion by the original species or from invasion/encroachment by another species.

Follow-up control is essential to prevent alien seedlings from suppressing planted or colonizing grasses. Before starting initial control operations in new infestations, all required follow-up control and rehabilitation work must be completed or in progress in areas initially prioritised for clearing and rehabilitation.

Follow-up control should combine the following methods:

- Chemical control methods (always use registered herbicides).
- Mechanical control methods, and
- Available biological control agents

Evaluate and select methods for follow-up control work according to species, and the type and density of re-growth.

9.2.1.7 Control methods for dense re-growth

Dense re-growth may arise after initial control operations, such as seedlings, root suckers or stump coppices. For example, wattle seedlings are stimulated to germinate after fire or seedlings may arise from a high seed bank in the soil.

- Do not uproot or hoe out dense seedlings. This would result in soil disturbance that promotes germination and flushes of alien seed growth.

- Do not cut plants to control stumps where stump density is high. Stump application would be impractical with many untreated stumps.
- Instead, cut tall dense re-growth with brush cutters or bush knives. Remove top growth to allow access for a foliar spray of coppice re-growth.

9.2.1.8 Control method for low-medium density re-growth

Areas with low-medium density re-growth are considered a high priority for control as neglect of these areas will result in densification and spread that is more costly to control. Large areas of low-density growth can be controlled rapidly.

- **Cut plants and control the stumps:** Stump height should be less than 15 cm. Use a recommended registered herbicide. Apply the herbicide mix with hand sprayers, paint brushes or knapsack sprayers at low pressure, using solid cone nozzles. Use a suitable dye to ensure no stumps are missed. For cut stump treatment, apply the herbicide mixed in water to the cut surface of the stumps. Do NOT spray the sides of the stumps. Apply the herbicide within 1 hour of cutting the plants before the wound seals. For total stump treatment, apply a herbicide mixed with diesel to the cut surface, down the sides of stumps and to exposed roots. The herbicide mix can be applied up to several days after cutting the plants.
- **Foliar spray on coppice re-growth and saplings:** Re-growth can be sprayed up to a height of 1 m. Apply the herbicide in knapsack sprayers using solid cone nozzles with a suitable dye to avoid over- or under-spraying.
- Mechanical control options: Hand-pull seedlings when the soil is wet, using gloves to protect the hands.

Maintenance control

Aim to keep the area stabilised by maintaining a good grass or shrub cover. Prevent further soil disturbance. An annual inspection of vegetation cover and alien plant re-growth is essential. Follow-up and maintenance control work each year will protect the planted plant cover. If this is neglected, the rehabilitated area will revert to dense patches of alien plants, resulting in increased control costs and loss of indigenous cover.

Integrated Control

Areas should be ranked into high, medium and low-priority work areas, where high-priority areas would be controlled first.

- High-Priority Areas for control
 - Low-density infestations
 - Start maintenance control in areas with low alien plant numbers, targeting especially mature seed-producing trees (identifiable by the presence of flowers during the flowering season and/or presence of seed), or parent trees that are a source of seed to the site. This may include trees outside of the site, within a minimum of 100 m from the site boundary.
 - Maintenance control is rapid and cost-effective.
 - This will protect the natural vegetation that is already there, prevent the formation of thickets, and halt the encroachment (spread) of alien plants into surrounding areas.
- Areas near the top of slopes, water courses, steep bare slopes or long bare slopes
 - Start control at the top end of water courses or at the top of slopes.
 - This prevents seeds from spreading downstream or downhill to infest new areas.
 - Plant grasses and/or shrubs on bare soil, especially on steep slopes or long bare slopes, to prevent erosion.
- Areas where initial control work is completed, and re-growth is present.
 - Complete major follow-up control and rehabilitation work in all areas before starting initial control in new infestations.
 - Control of seedlings protects newly planted vegetation.
 - Failure to control re-growth results in densification and spread of infestations, with increased control and loss of vegetation cover.
 - Continued maintenance is a long-term ongoing exercise to prevent re-infestation.
- Newly disturbed areas

- Areas where mechanical disturbance (such as removal of alien plants) or loss of vegetation cover has occurred provides an ideal seedbed for pioneer alien plant seedling establishment.
- This re-growth should be controlled while still less than 0.5 m tall.
- If this is neglected, re-growth will become taller and denser, resulting in more costly control work and loss of vegetation cover.
- Edges of dense spreading infestations
 - Confine infestations when there are insufficient funds to control the whole infestation and where the alien plants are likely to spread and invade neighbouring areas.
 - To prevent spread, control trees, saplings, seedlings, coppice re-growth or shrubs in a 5 - 10 m wide strip around the edges of such infestations to confine them.
 - Move inwards from the edges with control work as funds become available.
- Low-density areas inside dense infestations
 - Thin inside infestations to prevent densification (i.e., control all low-density areas inside the infestations to encourage grass growth. This will break up the large infestations into several smaller infestations that are more easily controlled.
 - Natural vegetation will gradually spread into the controlled areas as the alien plants die or are removed. The direction of grass spread, therefore, follows the control work, as the alien plants die. Sow seed in bare soil for a more rapid ground cover, especially on steep slopes or on easily eroded soil.
 - Monitor confined and thinned infestations 2 - 3 times each year. Repeat follow-up control operations as required, to ensure the controlled areas remain clear of re-growth and that the planted vegetation has established and remains healthy. Seedling re-growth will be evident in spring and early summer while re-growth and coppice will be easily observed in summer. When a re-infestation is observed it should be controlled immediately.
- Low-priority areas for control
 - Stabilised areas where there is a healthy dense vegetation cover, and any alien plants are very sparse, difficult to detect and with little or no impact at present. Monitor alien plant growth and grass cover 2-3 times a year to ensure timely maintenance work.
 - Areas where dense infestation could become worse. Confine these dense infestations to prevent the spread into new areas.
 - Areas where alien plants have little or no impact.

Thus, **high-priority** areas are identified where resources should be concentrated to achieve the desired aims. Control in these areas gives the greatest total benefit and allows the best use of the limited available resources.

The **low-priority** areas would consume resources with little benefit and should therefore be ignored or re-evaluated each year for attention at a later date.

9.2.2 Rehabilitation and revegetation plan

9.2.2.1 Purpose

The revegetation and rehabilitation plan are to ensure that areas cleared or impacted during construction activities of the proposed facility are rehabilitated with a plant cover that reduces the risk of erosion from these areas as well as restores ecological function to these areas as far as possible. The intention of the plan is not to provide a fully operational plan with detailed method statements and approaches, but rather to outline the principles that should underpin the operational implementation plan with rehabilitation actions that the appointed contractor would apply at the site during and immediately after construction.

9.2.2.2 Rehabilitation goals

It is important to define a rehabilitation benchmark and end goal against which relative rehabilitation success at a site can be measured. The Society for Ecological Restoration (2002) provides eight objectives for a restored ecosystem:

- It should contain characteristic species that occur in the reference system.
- It should comprise largely of indigenous species.

- The functional groups necessary for continued stability must be present or have the potential to colonise.
- The physical environment must be conducive for the establishment of species that will lead to stability.
- It functions normally for its stage of development.
- It is integrated into a larger ecological matrix.
- Potential threats to the system's stability are eliminated.
- It is self-sustaining to the same degree as the reference system.

The above goals are fairly broad and the discussion that follows will provide details on how these goals can be achieved and what indicators can be used to measure progress towards these goals.

9.2.2.3 Rehabilitation Targets

Although the overall goal of rehabilitation is provided above, it is common practice to set measurable targets against which progress can be measured and evaluated. Parameters that are usually measured include indicators of plant community structure and composition such as similarity to a reference area, species richness, species diversity, vegetation cover, species dominance, vertical structure and functional diversity of the vegetation. Important considerations with regard to setting such targets include ensuring that they are achievable, and secondly, that they change appropriately over time. In other words, there should be different targets for a parameter based on the time since rehabilitation. Targets for vegetation cover should be set as follows in reference to the baseline cover of the undisturbed vegetation:

- Year 1: 20%
- Year 2: 40%
- Year 3: 60%

Assuming that the background vegetation cover is 40% as typically occurs in the study area, the actual plant cover that would represent the above targets are as follows:

- 8% Cover
- 16% Cover
- 24% Cover

These targets must be closely tied to the monitoring schedule to provide references against which the effectiveness of monitoring can be measured. The ultimate goal should be to achieve approximately 80% of the background perennial plant cover.

Much has been made of species richness targets for rehabilitation. However, in most situations, these are not directly relevant as the emphasis should be on restoring ecological function. It is not practical or cost-effective to attempt to restore high levels of plant biodiversity within a short time frame. Once some ecological function is restored, species richness will slowly increase and ultimately the effectiveness of rehabilitation in restoring species richness can only be evaluated after 10 or more years after rehabilitation. However, it is important to note that rehabilitation with a variety of species provides increased resilience to drought and other pressures. As a result, rehabilitation with single species stands is not recommended and at least 3-4 species should be used in any area.

9.2.2.4 Plant Species suitable for Rehabilitation

No alien species should be used for rehabilitation within areas of natural vegetation. Although some of these are easy to establish, in the long run, they retard the return of the indigenous species and do not contribute to meeting rehabilitation goals. Although the species selected for use in rehabilitation should come from the local indigenous species pool, not all species are equally suitable for use in rehabilitation. The primary criteria for selection are practical and economic which usually dictate the ease with which species can be established. This includes survival rates, with establishment success being measured in the field at least a year after planting once plants can be considered established and self-sustaining. Although there are not large numbers of species which are suitable for rehabilitation, it is important to select a mix of functional types or growth forms (i.e., a mix of grasses, low shrubs and tall shrubs) as this adds structural diversity to the rehabilitated areas and also increases resilience.

In terms of which species are considered suitable for use in rehabilitation and revegetation at the site, it is useful to consider what attributes such species should or should not have. For example, species which grow tall, or which might quickly generate a high fire danger are considered unsuitable for use near infrastructure due to the risks and management problems they may cause. In addition, annual species which flourish only after rains are

also considered unsuitable as these would be absent in dry periods, leaving the soil exposed and vulnerable to erosion. The following general criteria have been identified as being important or useful in the selection of species for use in revegetation and rehabilitation. Some of these are considered essential criteria and others are considered desirable.

- Essential Criteria:
 - **Only perennial species should be used.** Short-lived species may flourish after rains but die out shortly thereafter. In addition, such species may function to keep more desirable perennial species out by depressing their growth and establishment.
 - **Only naturally occurring species are considered.** Species which do not naturally occur in the area are not considered viable options for use at the site.
 - **No toxic or weedy species are to be used.** Any species which are considered toxic to animals or people are not suitable candidates for use.
- Desirable Criteria:
 - **Commercial availability of seed.** Ideally, a species should have seed commercially available so that large quantities of seed can be purchased and used to establish the species across the site.
 - **Ease of propagation.** For species that cannot be easily propagated from seed or for which seed is not commercially available, it is important that these species can be easily propagated vegetatively or by other means using standard nursery propagation techniques.
 - **Ease of establishment.** Species used should be relatively easy to establish on-site, preferably using methods that be used across a broad area, such as standard agricultural planters or seed spreaders.
 - **Ease of management.** Species used should be relatively easy to manage and should not pose a risk of becoming a problem at the site through establishing dense thickets, producing excessive biomass or otherwise hindering the daily operation of the plant.

9.2.2.5 Monitoring and Evaluation

The primary purpose of monitoring should be to inform and enable adaptive management interventions and improve rehabilitation outcomes. As such, monitoring must be linked to targets, their associated measurement intervals as well as what actions are triggered when a target has not been met. There should thus be clearly defined feedback between monitoring outcomes and consequent rehabilitation actions. A critical component of monitoring is detailed record-keeping and associated data management.

There are various approaches to monitoring and parameters that can be measured. It is however important that these are relevant and practical to measure. Simple indicators such as plant cover and species richness are usually the most simple and reliable to measure, with a variety of published and well-known sampling methods.

As rehabilitation success is unpredictable in arid environments, monitoring and follow-up actions are important to achieve the desired cover and soil protection. The following basic monitoring schedule with associated remedial actions is recommended:

- Re-vegetated areas should be monitored every 6 months for the first 18 months following construction. Thereafter, monitoring should be conducted annually until such time as the target areas have attained the desired benchmark vegetation cover.
- Re-vegetated areas showing inadequate surface coverage (less than 20% within 12 months after re-vegetation) should be prepared and re-vegetated.
- Any areas showing erosion should be re-contoured and seeded with indigenous shrubs or succulents present in the local area.

9.2.3 Plant Rescue and Protection

Purpose of the Plant and rescue protection plan

The purpose of the plant rescue and protection plan is to implement avoidance and mitigation measures to reduce the impact of the development on listed and protected plant species and their habitats. Although this report identifies those species suitable for search and rescue at the site, it is important to note that a preconstruction walk-through of the site would also be important to refine the list of species identified for search and rescue, as well as locate such species prior to construction.

The objective of reusing plants in the project area is to prevent the loss of species either directly or through future extinction and minimise impacts of development on population dynamics of species of conservation concern and comply with the relevant legislation.

Preserving the natural configuration of habitats as part of ecosystems, thus ensuring a diverse but stable hydrology, substrate and general environment for species to be able to become established and persist.

9.2.4 Effect of removing individual species of conservation concern

Species of conservation concern are declining either due to overexploitation or because their range of occupancy is limited and further infringed on by development. Most plant populations require a certain minimum number of individuals within a population or metapopulation to allow for sufficient genetic transfer between individuals. This prevents genetic erosion and hence weakening the ability of individuals to persist in their environments. Similarly, where the distance between metapopulations is significantly increased due to fragmentation and the resultant loss of some populations, populations may suffer genetic decline due to restricted movement of pollen. Pollinators or other species that depend on a particular plant species for a specific microhabitat or food source may be equally affected because of the reduction of available resources. Therefore, the aim of plant rescue actions is always to maintain as many individuals of a plant population in as close proximity to the original habitat as possible to minimise the loss of individuals and fragmentation of populations to prevent the creation of future extinction debts of the development. Three species of conservation concern have been identified by the botanist that requires translocation under the provincial ordinance. This will apply to these three species located in the development footprint or within 20m of the development edge.

9.2.4.1 Successful plant rescue

Successful plant rescue can only be achieved if:

- Species can be removed from their original habitat with minimal damage to the plant, especially the roots.
- All plants removed are safely stored and treated according to their specific requirements prior to being transplanted again.
- They are relocated into suitable habitats and protected from further damage and all disturbances to aid their re-establishment.
- The timing of planting activities is planned with the onset of the growing season.
- Steps are taken where necessary to aid the initial establishment of vegetation, including occasional watering.

9.2.4.2 Time of planting

- All planting shall be carried out as far as is practicable during the period most likely to produce beneficial results (i.e., during the peak growing season), but as soon as possible after the completion of a section of earthworks.
- Drainage line rehabilitation preparation must be done during autumn, and planting of appropriate species in these areas should commence during early spring after the first rains.

9.2.4.3 Plant Search and Rescue

Prior to construction, once all the areas where topsoil will be removed or areas will be transformed have been demarcated, the contractor and/or appointed specialist will be responsible to remove all bulbous species from the topsoil, as well as succulents and small indigenous shrubs that can be transplanted. These are to be kept in a raised, protected position in a designated area until they can be replanted again as part of the rehabilitation process. Further details are listed in the Rehabilitation and Revegetation Plan.

9.2.5 Animal Rescue and protection

To ensure the protection of animals on the site, as part of the induction training of all employees, the ECO will include animal awareness training that will address the types of animals known to the site or that can be anticipated at the site as well as the process of how to deal with different animal encounters. The ECO should ensure the following is adhered to:

- Any animal (mammal, reptile, amphibia, bird, insect or fish) found to be trapped within the site or in distress as a result of the site activities shall be appropriately relocated to a suitable site under the guidance of the ECO, relevant specialist if required or relevant authorities.
- Open trenches, excavations and earthworks pose a hazard to both domestic livestock and wild animals:
 - Trenches shall be regularly, inspected if they can be assessed by animals.
 - Domestic animals or livestock belonging to surrounding or landowners shall be kept away from the works, and in this regard, appropriate stock-proof fencing may be required around excavations and earthworks.
- Hunting or snaring any animal (mammal, reptile, amphibian, bird, insect or fish) is prohibited. Capturing any animal is prohibited, unless on instruction by the ECO where the animal is at risk from the development activities. No animal may be wilfully harmed unless it threatens the life of a person, or the person is in imminent danger.
- Potable water shall be provided for drinking purposes at the main Contractor's camp. Should a potable water supply/container be provided, then:
 - It is to be animal and weatherproof and sealed/fenced to prevent potential contamination /drowning.

9.2.6 Open Space Management Plan

This Open Space Management Plan provides the tool to contribute to safeguarding the natural assets and open spaces within the study area. Open spaces include recreation areas, nature conservation areas, areas of environmental significance and biodiversity, undeveloped areas which might be publicly or privately owned, urban agricultural land, natural areas like dense indigenous bush stands, natural veld and nature reserves, urban wilds, the rivers and wetlands, wildlife, geological features, soils and vegetation, etc. An open space management plan enables continuity in the planning and management of open space as a collective resource. The following management actions take into account natural areas and open spaces, referring to the community perceptions and benefits, but also the threats and challenges facing open spaces within the study area.

The objective of open space management is to restore, enhance and rehabilitate open spaces, improve climate change adaptations through the minimisation of biodiversity loss, and mitigate environmental degradation. Management actions consider open spaces and natural areas as well as community perceptions of these.

In the context of the proposed grid connections and substations, the primary purpose of the open plan management plan is therefore to:

- Minimise visual impact on the character of the area; and
- Maintain biodiversity within the area to ensure that no long-term negative impacts occur on the local environment.

The following actions should be implemented by the Contractor and Project Company

- Promote environmental awareness in all employees and sub-contractors and create an understanding of the environmental sensitivities of the project site.
- No waste, including organic matter, may be disposed of anywhere on site, except in provided bins placed at convenient locations, especially during the construction period. Disciplinary actions should be taken against littering.
- Open spaces are to be kept free of alien plants and weeds.
- Indigenous plants may not be collected or removed from the site.
- Access to the facility should be strictly controlled.
- All visitors and contractors should be required to sign in.
- Signage at the entrance should indicate that disturbance to fauna and flora is strictly prohibited.

The following activities should not be permitted by anyone except the landowner or his representatives:

- No fires within the site.
- No hunting, collecting or disturbance of fauna and flora, except where required for the safe operation of the facility and only by the Environmental Officer on duty and with the appropriate permits and landowner permission.
- No driving off of demarcated roads.

9.2.7 Stormwater Management Plan

A stormwater management plan must be revised during the pre-construction design phase by the civil contractor based on the detailed design of the site and implemented during the construction and operation phases of the project. The Proponent should develop an appropriate stormwater management plan for the operational phase of the project, based on the outcomes of the construction process. This plan shall comply with the Department of Water Affairs and Forestry's (DWAF) Best Practice Guideline (G1) for Stormwater Management (2006) and GN 704 (Government Gazette 20118 of June 1999). The plan should ensure compliance with applicable regulations and prevent off-site migration of contaminated stormwater or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of stormwater run-off. The final stormwater management plan will be approved as part of the Water Use License Application process, which will become a condition of authorisation for the broader development.

9.2.8 Fire Management Plan

This plan should be implemented during the construction and operation of the facility and should be guided by the following objectives:

- Preventing undesired wildfires.
- Implementing monitoring and reporting of fires on site.
- Providing all construction and operational staff with basic information about fire management for their safety and awareness; and
- Listing contact details and equipment relating to firefighting.

The National Veld and Forest Fires Act states that it is the landowner's responsibility to ensure that the appropriate equipment, as well as trained personnel, are available to combat fires.

Fires may occur under the right circumstances. Ignition risk sources in the area include the following:

- Lightning strikes
- Personnel within the facility
- Neighbouring communities
- Infrastructure such as transmission lines

Contractors are to ensure that they have the necessary equipment readily available to address fires that may arise as a result of construction activities.

9.2.9 Erosion Management Plan

The purpose of the erosion management plan is to implement avoidance and mitigation measures to reduce the erosion potential and the likely impact of erosion associated with the construction and operational phases of the proposed facility. As part of the management plan, measures to protect hydrological features from erosion damage are included.

This plan is intended at introducing measures aimed at reducing the negative impacts of erosion on biodiversity as well as reducing the vulnerability of the site to erosion problems during the construction and operational phases of the development. The focus is on managing runoff and reducing the construction phase impact on ecologically sensitive areas. The plan does not cover engineering-side issues which are of relevance to soil management and erosion. Therefore, issues such as the potential presence of heaving clays, compressible soils, perched water tables, dispersive soils and corrosive groundwater at the site are beyond the general scope of this study and are not directly dealt with. These issues would need to be addressed and their relevance assessed during the detailed geotechnical investigation of the site.

1.1.1.1 Types of Erosion

Erosion comes in several forms, some of which are not immediately obvious. The major types of erosion are briefly described below:

- **Raindrop impacts** - This is the erosion that occurs due to the “bomb blast” effect of raindrop impact. Soil particles can be blasted more than a meter into the air. Apart from loosening soil particles, the effect can also break soil aggregates apart and form a clay seal on the surface which resists infiltration and results in increased levels of runoff. This effect is most important when large areas of exposed soils are present. If the site is cleared, then this effect will play an important role as it results in the soil surface becoming sealed which reduces infiltration and increases runoff, leading to erosion.
- **Sheet Erosion** - This is the removal of a shallow and uniform layer of soil from the surface. It is caused initially by raindrop splash and then by runoff. Sheet erosion is often difficult to see as no perceptible channels are formed. Accumulated sediment at the bottom of the slope is often the only indicator. This is likely to be an important erosion type at the site given the gently sloping nature of the site and the susceptible soils.
- **Rill Erosion** - This is the removal of soil from the surface whereby small channels or rills up to 300 mm are formed. It is caused by runoff concentrating into depressions, wheel tracks etc.
- **Gully Erosion** - This is the removal of soil from the surface and sub-surface caused by concentrated runoff eroding channels greater than 300mm deep. Gully erosion often begins as rill erosion.
- **Wind Erosion** - Wind erosion results from soil particles being picked up, bounced or moved by the wind. Wind erosion is primarily a problem in arid areas and may affect sands soils as well as fine-textured soils. Vegetation cover is usually an effective barrier to wind erosion, but large soil losses or degradation can occur in disturbed areas or on croplands.

9.2.9.1 Promoting Factors

- **Rainfall characteristics** - High-intensity, short-duration storm events have much greater erosion potential than low-intensity, longer-duration storm events with the same runoff volume. Intense storms produce larger raindrops and are more likely to break up the soil and dislodge particles.
- **Soil erodibility** - Soil erodibility is determined by the soil's ability to resist detachment and transport due to rainfall, runoff and infiltration capacity. Well-structured soils with a high clay content are generally least erodible. Some clays are dispersible meaning that they break down when wet and become highly erodible. Silts and fine sands are highly erodible.
- **Length and Steepness of Slope** - Steeper slopes cause runoff velocities to increase, resulting in increased erosion. As the slope length increases the opportunity for runoff to concentrate and achieve an erosive velocity increases.
- **Soil Surface Cover** - Soil surface covers such as vegetation and mulch protect the soil surface from raindrop impact, reduce flow velocity, disperse flow, and promote infiltration and the deposition of sediment. This is a basic principle underlying many erosion control approaches which aim to modify the surface characteristics in order to reduce the flow velocity and reduce the potential for erosion. In this regard, it is important to note that many of the practices which are used to enhance rehabilitation potential are also useful in reducing erosion potential.

9.2.9.2 Erosion and Sediment Control Principles

The goals of erosion and sediment control during and after construction at the site should be to:

- Protect the land surface from erosion.
- Intercept and safely direct run-on water from undisturbed upslope areas through the site without allowing it to cause erosion within the site or become contaminated with sediment.
- Progressively revegetate or stabilise disturbed areas.
- Prevent damage to hydrological features such as drainage lines or wetlands, either within or adjacent to the site.

These goals can be achieved by applying the following principles:

- Integrate project design with site constraints.
- Plan and integrate erosion and sediment control with construction activities.
- Minimise the extent and duration of the disturbance.
- Control stormwater flows onto, through and from the site in stable drainage structures.
- Use erosion controls to prevent on-site damage.
- Use sediment controls to prevent off-site damage.
- Control erosion and sediment at the source.

- Stabilise disturbed areas promptly.
- Inspect and maintain control measures.

9.2.9.3 On-site Management

Exposed and unprotected soils are the main cause of erosion in most situations. Therefore, the erosion management plan and the revegetation and rehabilitation plan should be closely linked to one another and should not operate independently but should rather be seen as complementary activities within the broader environmental management of the site and should therefore be managed together.

General factors to consider regarding erosion risk at the site include the following:

- Soil loss will be greater during wet periods than dry periods. Intense rainfall events outside of the wet season, such as occasional unseasonal showers can also however cause significant soil loss. Therefore, precautions to prevent erosion should be present throughout the year.
- Soil loss is related to the length of time that soils are exposed prior to rehabilitation or stabilization. Therefore, the gap between construction activities and rehabilitation should be minimized. Allied with this is the fact that topsoil does not store well and should preferably be used within a month or at most within 3 months to aid in the revegetation and rehabilitation of disturbed areas.
- Phased construction and progressive rehabilitation are important elements of the erosion control strategy.
- The extent of disturbance will influence the risk and consequences of erosion. Therefore, large areas should not be cleared at a time, especially in areas such as slopes where the risk of erosion is higher.

9.2.9.4 The concentration of flows into downstream areas

- Road crossings over drainage lines, streams and wetlands can impact downstream wetland ecosystems. Crossings that result in a narrowing of the downstream system can result in the concentration of flows and channelisation downstream. This may result in a loss of wetland function, and result in the drying out and shrinkage of the wetland area. Erosion and increased vulnerability to the invasion of drier banks by alien vegetation may occur.
- Culverts should be adequately spaced such that they do not result in shrinkage of downstream wetlands. Where roads cross minor drainage channels, a single culvert may be adequate, aligned with the downstream drainage line. Where more substantial wetland systems are intercepted by a road, sufficient culverts should be provided such that downstream shrinkage of wetland width does not occur. Moreover, culverts should be aligned, as far as possible, with existing, natural channels.
- All crossings of drainage systems should ensure that both surface and shallow subsurface flows can be accommodated where appropriate and that unnatural channelisation does not occur downstream.

9.2.9.5 Runoff Concentration

The increase in hardened surfaces associated with roads, and other infrastructure will lead to a significant increase in volume and velocity of flow generated from these areas during large rainfall events.

Runoff from road surfaces is usually channelled off of the road surface towards the downslope side of the road. On steep slopes, the volume and velocity of runoff generated may result in erosion of the surrounding areas. Therefore, specific measures to curb the speed of runoff water is usually required in such areas, such as rock beds or even gabions. In addition, these areas should be monitored for at least a year after construction to ensure that erosion is not being initiated in the receiving areas. Once erosion on steep slopes has been initiated, it can be very difficult to arrest.

Diversion of Flows - Diversion of flows from natural drainage channels may occur when roads interrupt natural drainage lines, and water is forced to run in channels along the manipulated road edge to formalized crossing points. Even a slight diversion from the natural drainage line can result in excessive downstream erosion, as the new channel cuts across the slope to reach the valley bottom. Should the access road to the site traverse any major drainage lines, the following principles should apply.

- Adequate culverts should be provided along the length of all roads to prevent the diversion of flow from natural drainage lines.
- Culverts should be carefully located, such that outlet areas do in fact align with drainage lines.

- The downstream velocity of runoff should be managed, such that it does not result in downstream erosion – on steep slopes, where roads have been constructed on cut areas, allowance should be made for culverts to daylight sufficiently far down the slope that their velocities are managed, and erosion does not occur.
- Where necessary, anti-erosion structures should be installed downstream of road drains – these may comprise appropriate planting, simple riprap or more formal gabion or other structures.
- Roads and their drainage system should be subject to regular monitoring and inspection, particularly during the wet season, so those areas where head-cut erosion is observed can be addressed at an early stage.

9.2.9.6 Monitoring requirements

Construction phase - The following monitoring actions should be implemented during the construction phase of the development.

Monitoring Action	Indicator	Timeframe
Identify all river and drainage line crossings affected by the development	Map of sites of potential concern	Preconstruction
Monitor cleared areas for erosion problems	Record of monitoring site, problems encountered, and remedial actions implemented	Monthly during the rainy season and following significant rainfall events.
Monitor vegetation clearing activities near sensitive areas such as wetlands or drainage lines	The activity log of monitoring actions and any mitigation and avoidance measures implemented	Monthly during the rainy season and following significant rainfall events
Monitor revegetated and stabilised areas	Record of monitoring site, problems encountered, and remedial actions implemented	Monthly during the rainy season and following significant rainfall events

Operation phase - The following monitoring actions should be implemented during the operational phase of the development.

Monitoring Action	Indicator	Timeframe
Monitor for the development of new erosion problems across the site, with a focus on areas where water has been diverted or collected from upslope onto downslope areas	Map of erosion problem areas	Quarterly
Document erosion control measures implemented	Records of control measures and their success rate.	Quarterly
Document the extent of erosion at the site and the remedial actions implemented	The decline in erosion and vulnerable bare areas over time	Biannually

9.2.10 Emergency Response Plan (ERP)

There are three levels of emergency as follows:

- Local emergency: An alert confined to a specific locality.
- Site Emergency: An alert that cannot be localised and which presents danger to other areas within the site boundary or outside the site boundary.
- Evacuation: An alert when all personnel are required to leave the affected area and assemble in a safe location.

If there are any doubts as to whether any hazardous situation constitutes an emergency, then it must be treated as an evacuation.

Every effort must be made to control, reduce or stop the cause of any emergency provided it is safe to do so. For example, in the event of a fire, isolate the fuel supply and limit the propagation of the fire by cooling the adjacent areas, then confine and extinguish the fire (where appropriate) making sure that re-ignition cannot occur.

9.2.10.1 Emergency Scenario Contingency Planning

a) Scenario: Spill which would result in the contamination of land, surface or groundwater

Spill Prevention Measures –

Preventing spills must be the top priority at all operations which have the potential of endangering the environment. The responsibility to effectively prevent and mitigate any scenario lies with the Contractor and EO. In order to reduce the risk of spills and associated contamination, the following principles should be considered during construction and operation activities:

- All equipment refuelling, servicing and maintenance activities should only be undertaken within appropriately sealed/contained or banded designated areas.
- All maintenance materials, oils, grease, lubricants, etc should be stored in a designated area in an appropriate storage manner.
- No refuelling, storage, servicing or maintenance of equipment should take place within sensitive environmental resources in order to reduce the risk of contamination by spills.
- No refuelling or servicing should be undertaken without absorbent material or drip pans properly placed to contain spilt fuels.
- Any fluids drained from the machinery during servicing should be collected in leak-proof containers and taken to an appropriate disposal or recycling facility.
- If these activities result in damage or accumulation of product on the soil, the contaminated soil must be disposed of as hazardous waste. Under no circumstances shall contaminated soil be added to a spoils pile and transported to a regular disposal site.
- Chemical toilets used during construction must be regularly cleaned. Chemicals used in toilets are also hazardous to the environment and must be controlled. Portable chemical toilets could overflow if not pumped regularly or they could spill if dropped or overturned during moving. Care and due diligence should be taken at all times.
- Contact details of emergency services and HazMat Response Contractors are to be clearly displayed on the site. All staff are to be made aware of these details and must be familiar with the procedures for notification in the event of an emergency.

Procedures –

The following action plan is proposed in the event of a spill:

- Spill or release identified.
- Assess person's safety, the safety of others and the environment.
- Stop the spill if safely possible.
- Contain spill to limit entering surrounding areas.
- Identify the substance spilt.
- Quantify the spill (under or over guideline/threshold levels).
- Notify the Site Manager and emergency response crew and authorities (in the event of a major spill i.e. >200l).
- Inform users (and downstream users) of the potential risk.
- Clean up the spill using a spill kit or by the Hazmat team.
- Record the spill incident on the company database.

Procedure for containing and controlling the spill (i.e., on land or in water)

Measures can be taken to prepare for quick and effective containment of any potential spills. Each contractor must keep sufficient supplies of spill containment equipment at the construction sites, at all times during and after the construction phase. These should include specialised spill kits or spill containment equipment. Other spill containment measures include using drip pans underneath vehicles and equipment every time refuelling, servicing or maintenance activities are undertaken.

Specific spill containment methods for land and water contamination are outlined below.

Containment of Spills on Land –

Spills on land include spills on rock, gravel, soil and/or vegetation. It is important to note that soil is a natural sorbent and therefore spills on soil are generally less serious than spills on water as contaminated soil can be more easily recovered. It is important that all measures be undertaken to avoid spills reaching open water bodies located outside of the study area. The following methods could be used:

- Dykes - Dykes can be created using soil surrounding a spill on land. These dykes are constructed around the perimeter or downslope of the spilt substance. A dyke needs to be built up to a size that will ensure containment of the maximum quantity of contaminant that may reach it. A plastic tarp can be placed on and at the base of the dyke such that the contaminant can pool up and subsequently be removed with sorbent materials or by a pump into barrels or bags. If the spill is migrating very slowly, a dyke may not be necessary, and sorbents can be used to soak up contaminants before they migrate away from the source of the spill.
- Trenches - Trenches can be dug out to contain spills. Spades, pickaxes or a front-end loader can be used depending on the size of the trench required. Spilt substances can then be recovered using a pump or sorbent materials.

Procedure for transferring, storing and managing spill-related wastes.

Used sorbent materials are to be placed in plastic bags or where unsuitable, other appropriate containers for future disposal. All materials mentioned in this section are to be available in or alongside the spill kits. Following clean-up, any tools or equipment used must be properly washed and decontaminated or replaced if this is not possible.

Spilt substances and materials used for containment must be placed into empty waste oil containers and sealed for proper disposal at an approved disposal facility.

Procedure for restoring affected areas.

Criteria that may be considered include natural biodegradation of oil, replacement of soil and revegetation. Once a spill of reportable size has been contained, the ECO and the relevant Authority must be consulted to confirm that the appropriate clean-up levels are met.

b) Scenario: Fire (and fire water handling)

Action Plan

The following action plan is proposed in the event of a fire:

- Quantify risk.
- Assess a person's safety, the safety of others and the environment.
- If safe- attempt to extinguish, or contain a fire.
- Notify the Site Manager and emergency response crew and authorities.
- Inform users of the potential risk of fire.
- Record the incident on the company database or filling register.

Procedures

Because large-scale fires may spread very fast it is most advisable that the employee/contractor not put his/her life in danger in the case of an uncontrolled fire.

Portable firefighting equipment must be provided at strategic locations throughout the site, in line with the Building Code of South Africa and the relevant provincial building code. All emergency equipment including portable fire extinguishers, hose reels and hydrants must be maintained and inspected by a qualified contractor in accordance with the relevant legislation and national standards.

Current evacuation signs and diagrams for the building or site that are compliant with relevant state legislation must be provided in a conspicuous position on each evacuation route. Contact details for the relevant emergency services should be clearly displayed on-site and all employees should be aware of the procedure to follow in the case of an emergency.

Procedure for initial actions

Persons should not fight the fire if any of the following conditions exist:

- They have not been trained or instructed in the use of a fire extinguisher.
- They do not know what is burning.
- The fire is spreading rapidly.
- They do not have the proper equipment.

- They cannot do so without a means of escape.
- They may inhale toxic smoke.

Reporting procedures

In terms of the requirements of NEMA, the responsible person must, within 14 days of the incident, report to the Competent Authority, as well as the provincial head of department (for environmental affairs) and municipality.

- Report fire immediately to the site manager, who will determine if it is to be reported to the relevant emergency services and authorities.
- The Site manager must have copies of the report form to be completed.

9.2.11 Heritage Chance Finds Procedure

For any chance heritage finds, all work must cease in the area affected (within at least 10m) and the Applicant / Contractor must be immediately informed.

- A registered heritage specialist must be called to site to inspect the finding/s. The relevant heritage resource agency (the Institute) must be informed about the finding/s.
- The heritage specialist will assess the significance of the resource and provide guidance on the way forward.
- Permits must be obtained from the Institute if heritage resources are to be removed, destroyed or altered.
- Under no circumstances may any heritage material be destroyed or removed from site unless under direction of a heritage specialist.
- Should any human remains be found, the South African Police Service as well as the Institute must be contacted. No SAPS official may remove remains (recent or not) until the correct permit/s have been obtained.
- The following steps / protocol should be implemented in terms of chance fossil finds:
 - When construction activities begin, any rocks disturbed during this process must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone, and coal) should be put aside in a suitably protected place.
 - Photographs of possible fossil plants must be provided to the Developer to assist in recognizing the fossil plants. This information should be built into the Environmental Management Programme's (EMPr) training and awareness plan and procedures.
 - Photographs of putative fossils should be sent to a palaeontologist for preliminary assessment.
 - If there is any possible fossil material found by the environmental officer / developer, then a qualified palaeontologist must be sub-contracted in order for them to visit the site to inspect the selected material and check the dumps where feasible.
 - Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site, permit must be obtained from the Institute. Annual reports must be submitted to the Institute as required by the relevant permits.

9.3 PROGRAMMES

9.3.1 Environmental Awareness programme

It is crucial that each employee and visitor to the site is aware of the impact that their actions may have on the environment. Each employee will be required to attend an environmental awareness training session as an induction to the site, and ongoing toolbox talks and sharing of lessons learnt are encouraged. Passive environmental awareness measures should also be implemented such as having informative posters placed around the construction camp, and appropriate signage where necessary (such as no-smoking signs near fuel storage areas). Emergency procedures should also be provided for in this environmental awareness plan.

9.3.1.1 Training

All employees and site personnel must undergo environmental awareness training at the start of the project. Each attendee must sign an attendance register on completion, and this must be kept by the Contractor and Project Manager. All employees and site personnel must be made aware of this EMPr and their role in the implementation of it.

An example of a presentation that may be used for training is appended to this report as Annexure C. The ECO (or ESA, under the guidance of the ECO) will provide the training and may provide the material. As a minimum, the following condition must be included:

- The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden.
- Personnel should not be allowed to wander off the construction site.

The social specialist recommended that the construction workers should be educated about their expected behaviour and the dangers of contracting sexually transmitted diseases such as HIV/Aids. The EAP recommends that this be included in the training required by the OHS.

9.3.1.2 Emergency procedures

The Contractor team must adhere to the OHS. In case of an emergency occurring on site, the team must react efficiently to reduce the potential impact. Emergencies on a construction site may include physical harm/ death; fire; spills or leakages.

A method statement must be provided by the Contractor for the emergency procedures for fire, accidental leaks and spillages of hazardous materials. This must include:

- Who shall be notified in the event of an emergency, including contact numbers for the relevant authority/
- Where and how any hazardous spills will be disposed of.
- The size of spillage which the emergency procedures could contain.
- Location of all emergency equipment and an indication of how regularly the emergency equipment will be checked to ensure that it is working properly.

Contact information for the emergency services in the area must be displayed in an accessible location. Appropriate emergency training (e.g., firefighting, first aid, etc.) must be given to members of the construction team prior to the construction period.

An incident/ complaints register must be established for emergencies and maintained on-site. A record of near misses should also be made. Corrective action must be undertaken immediately if a complaint is received, or a leak or spill, fire or injury is identified.

10 CONCLUSION

The EMPr must be regarded as a living document and changes must be made to this EMPr as required when the project advances while retaining the underlying principles and objectives on which the document is based. The compilation of the EMPr has incorporated environmental management best practice principles, impacts and mitigation measures from the draft Environmental Impact Assessment Report and all environmental specialist assessment reports (i.e., reports included as Annexure G of the Environmental Impact Assessment Report).

Appendix 1 - Site Sensitivity Maps

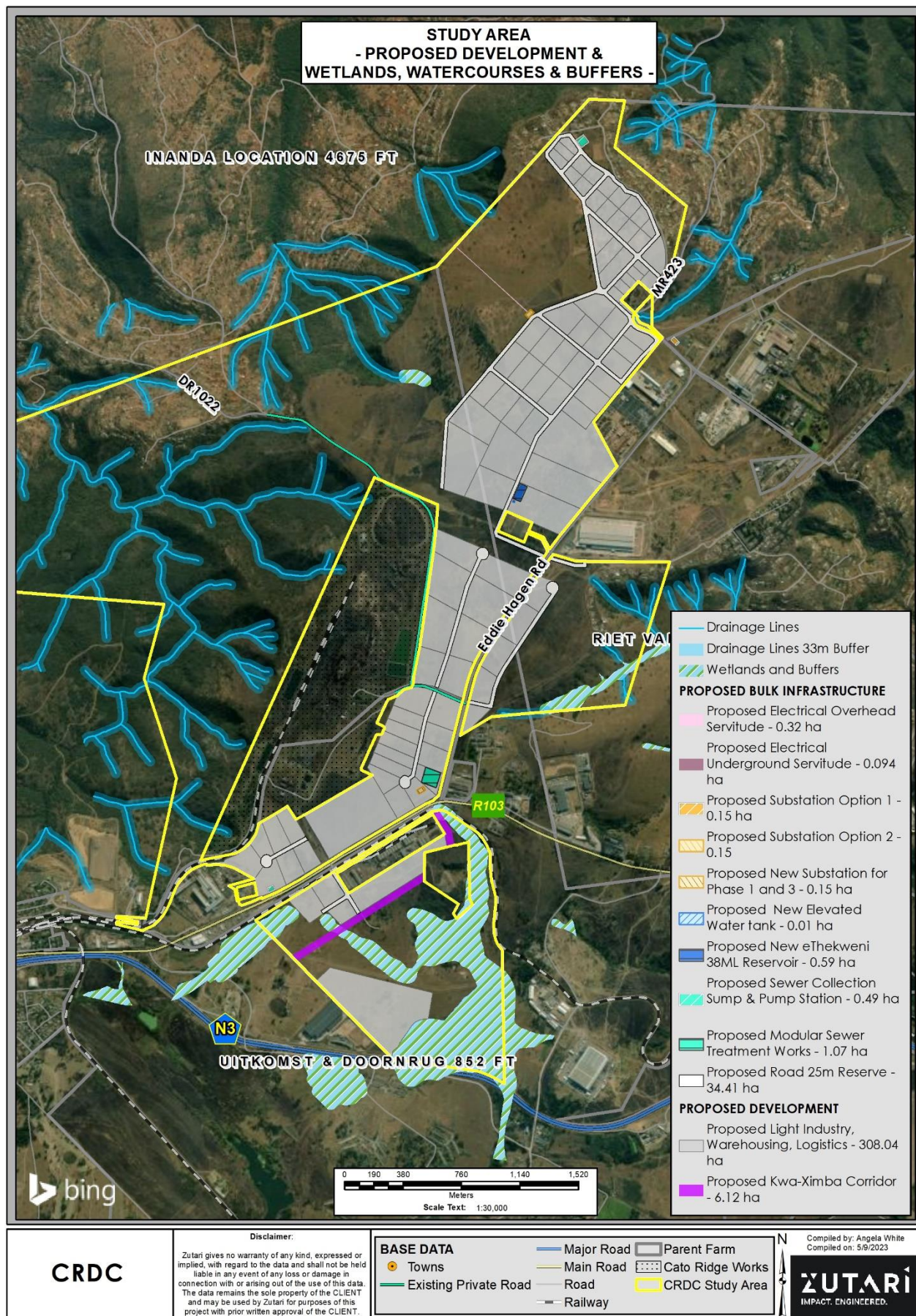


Figure 5: Wetlands, Water Courses & with Buffers

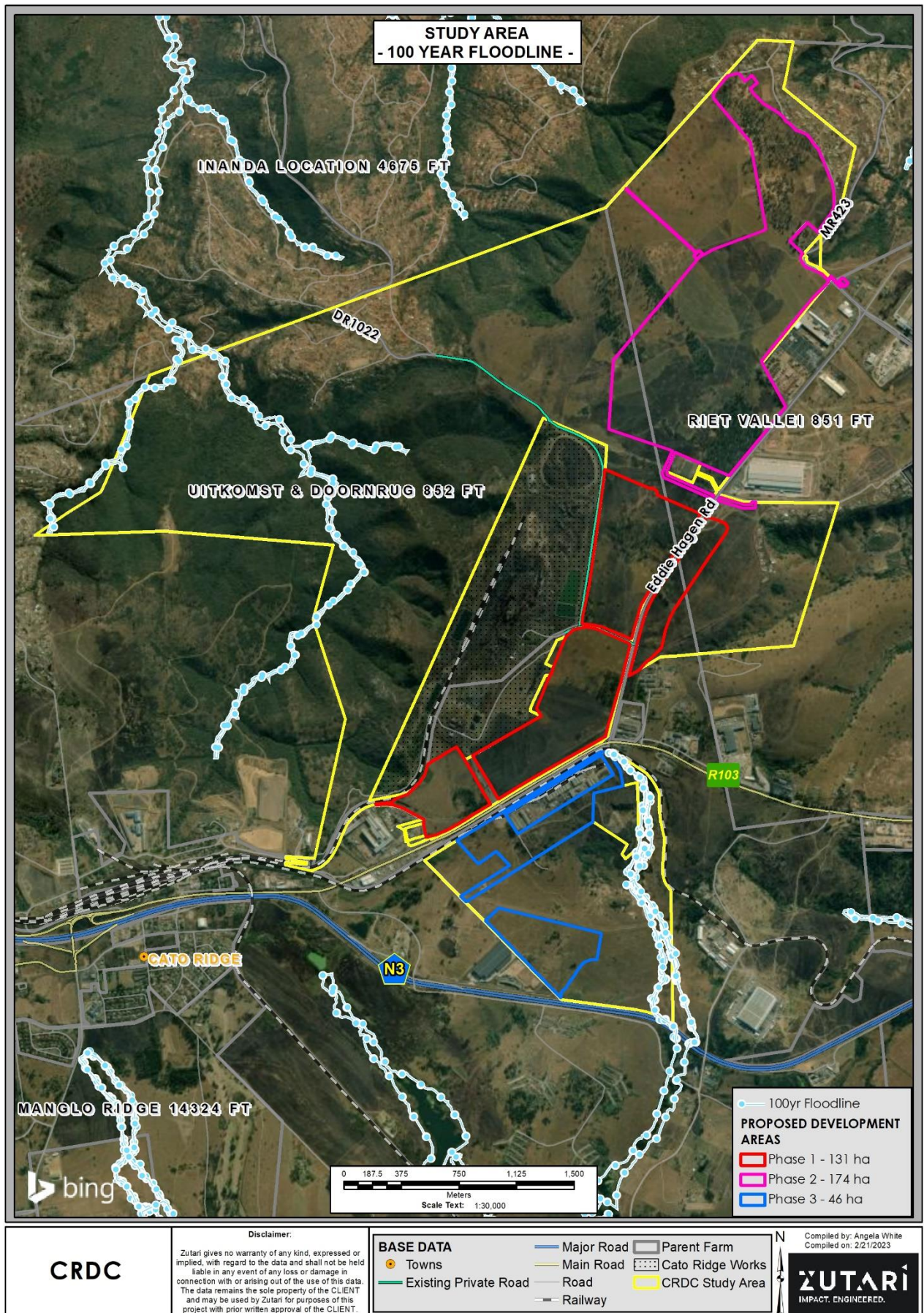


Figure 6: 1:100 Year Flood line

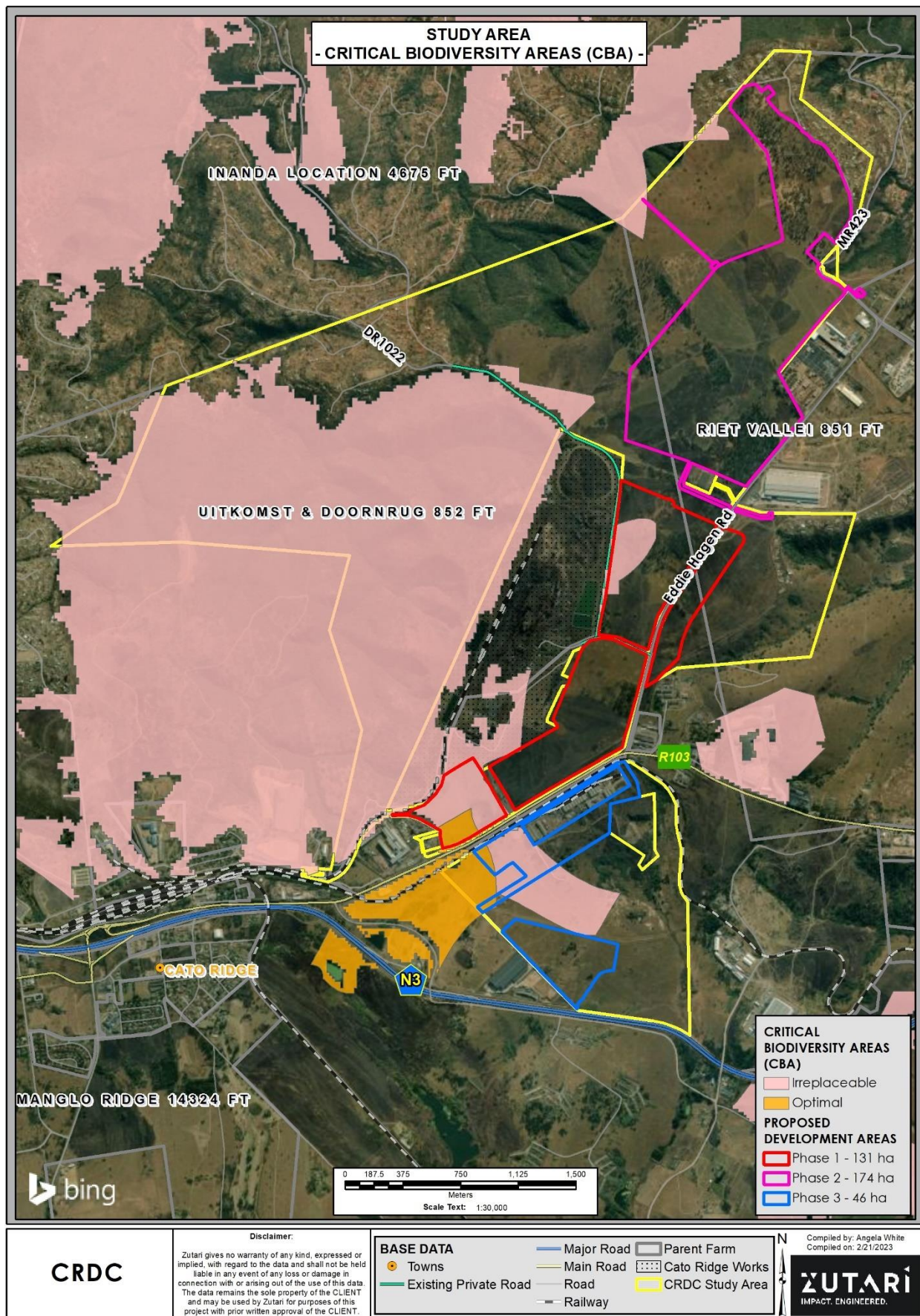


Figure 7: Critical Biodiversity Areas (CBA)

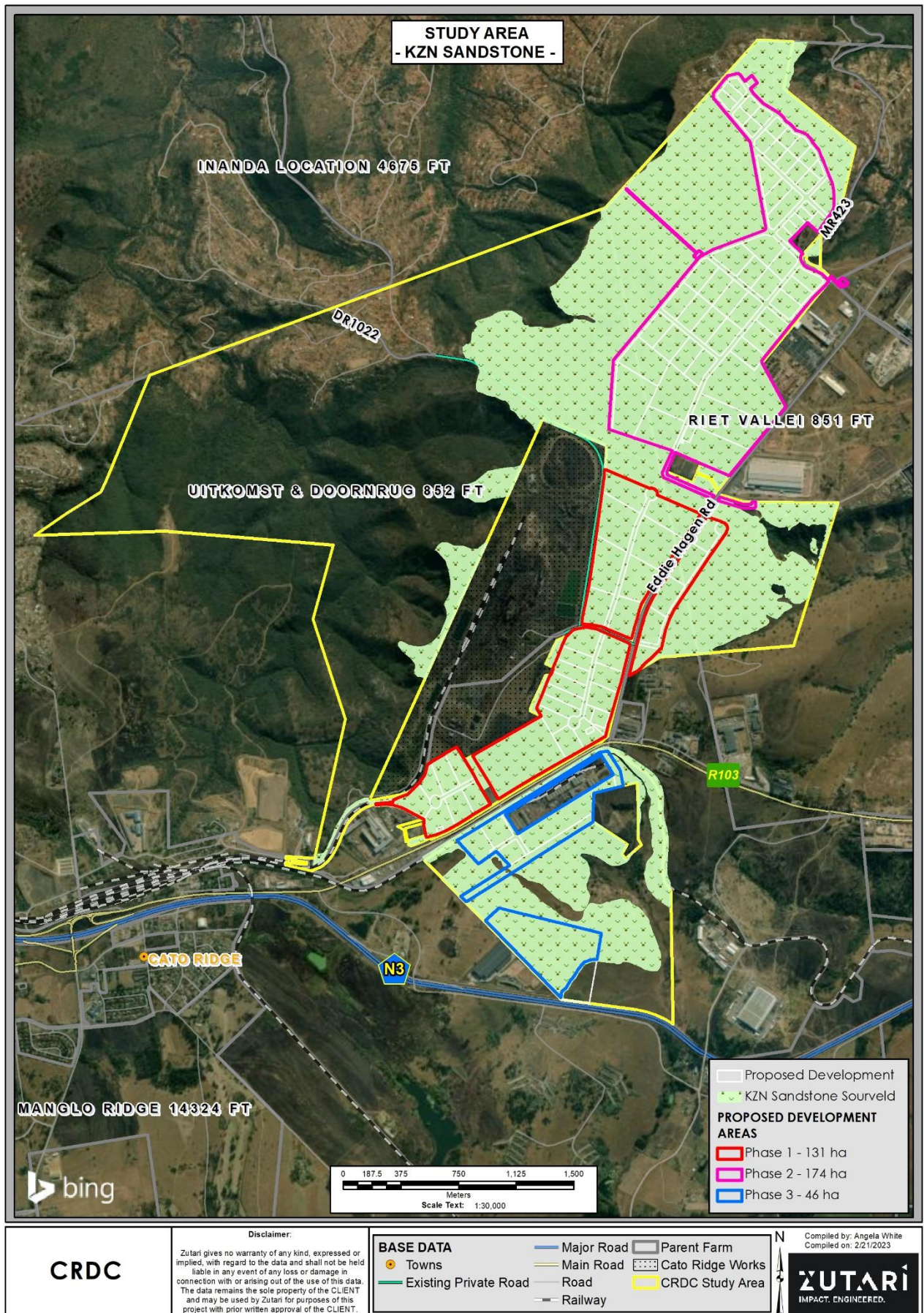


Figure 8: KZN Sandstone Sourveld Grassland areas

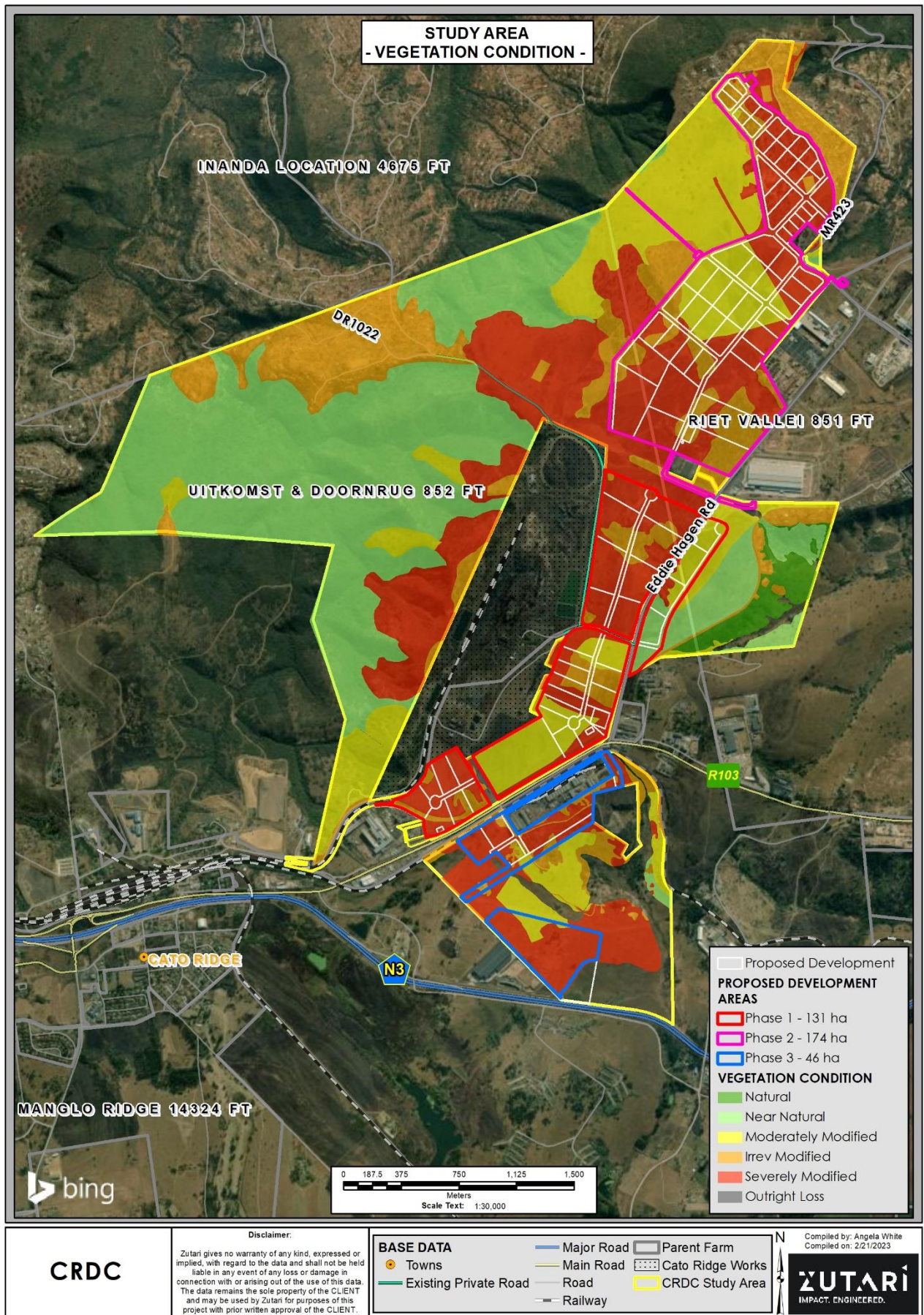


Figure 9: Vegetation Condition

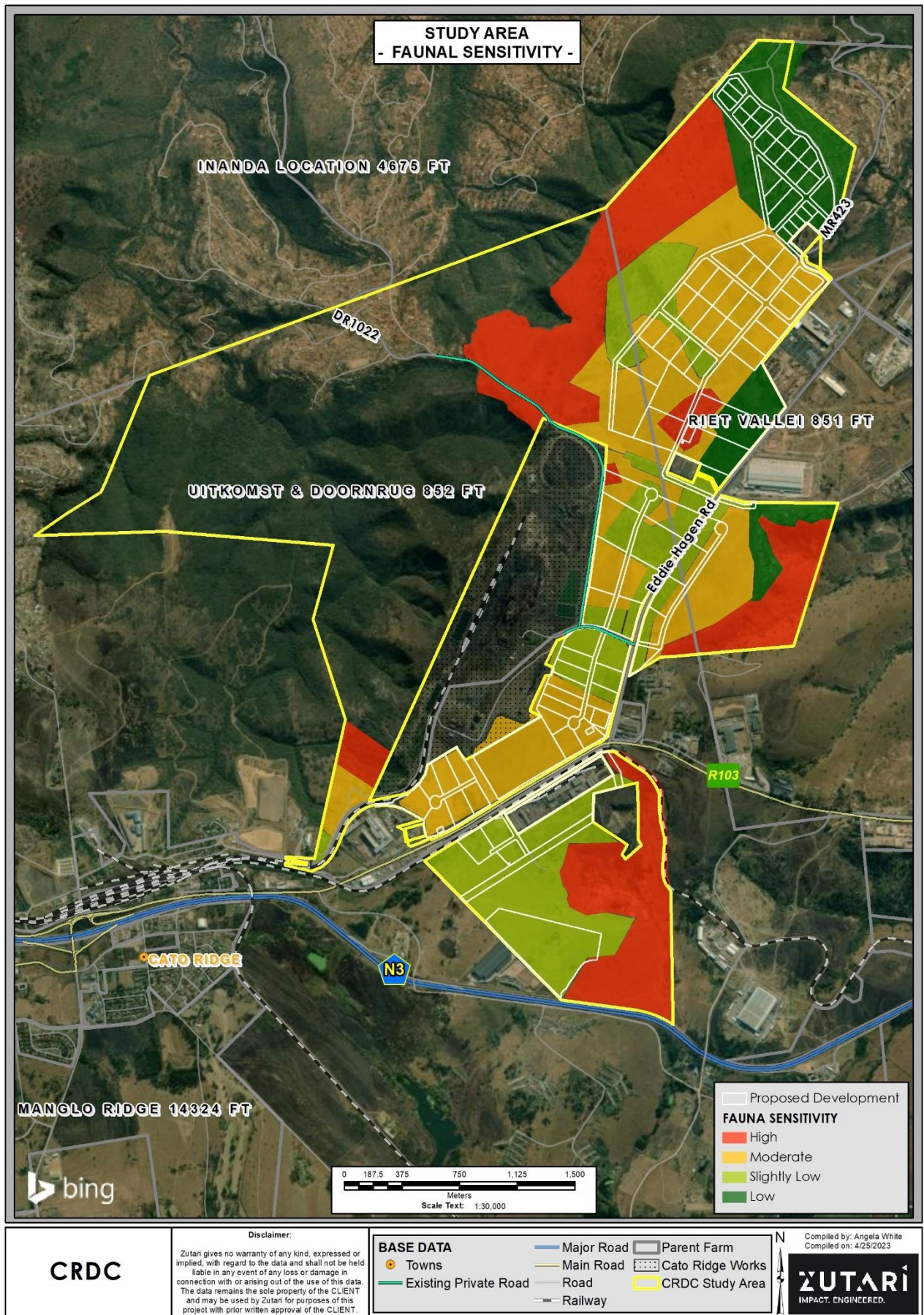


Figure 10: Faunal Sensitivity

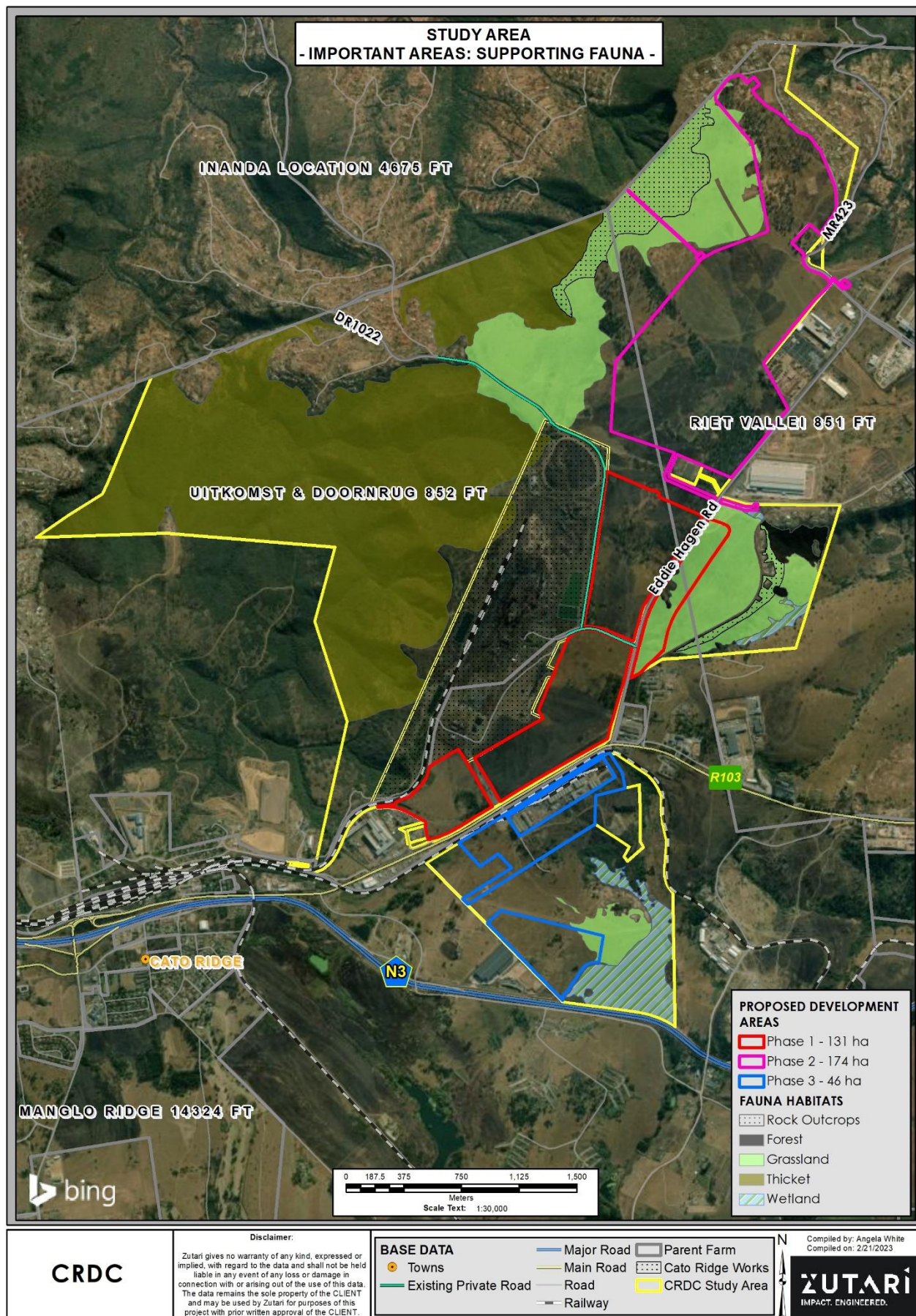


Figure 11: Important Areas: Supporting Fauna

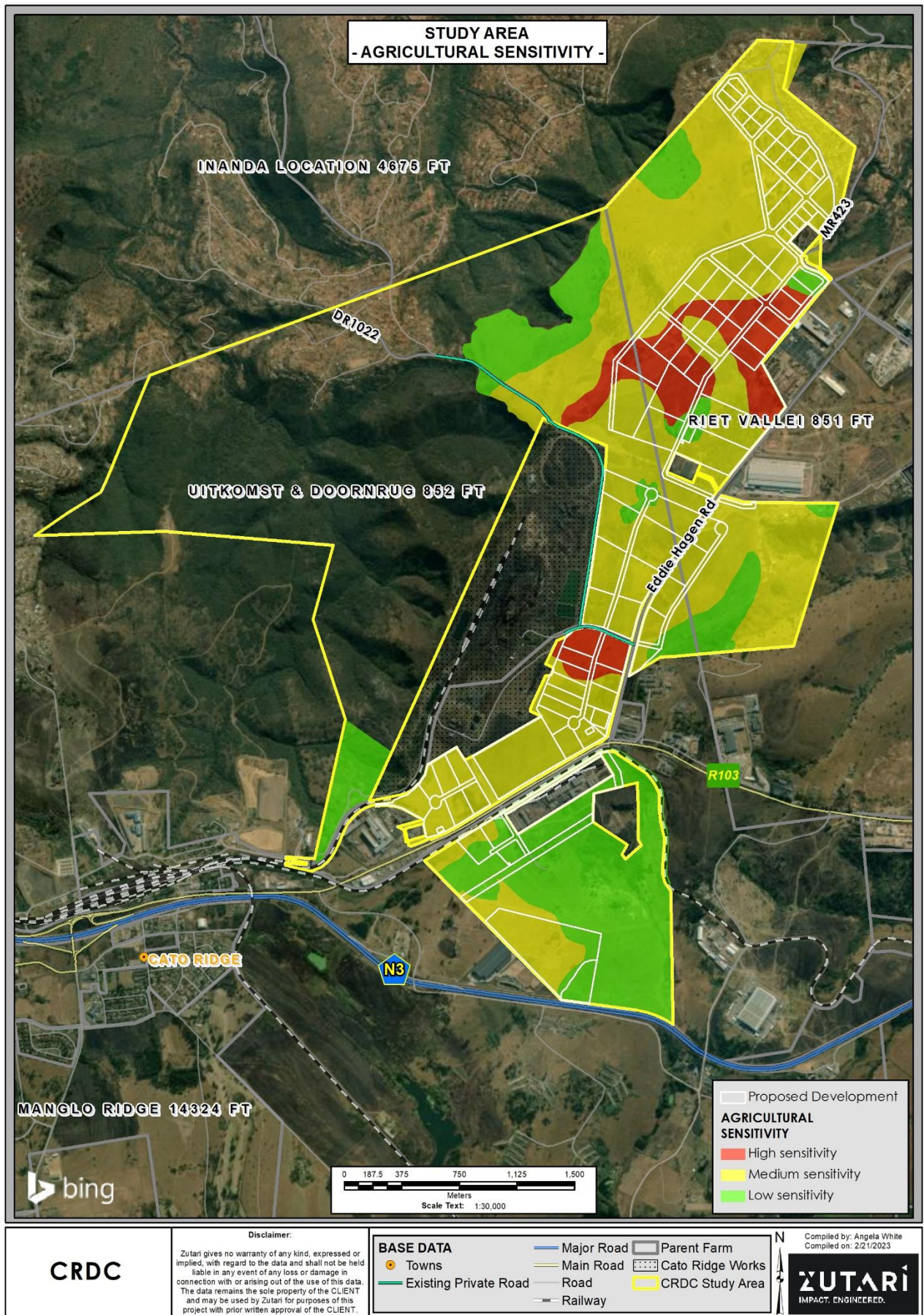


Figure 12: Agricultural Sensitivity

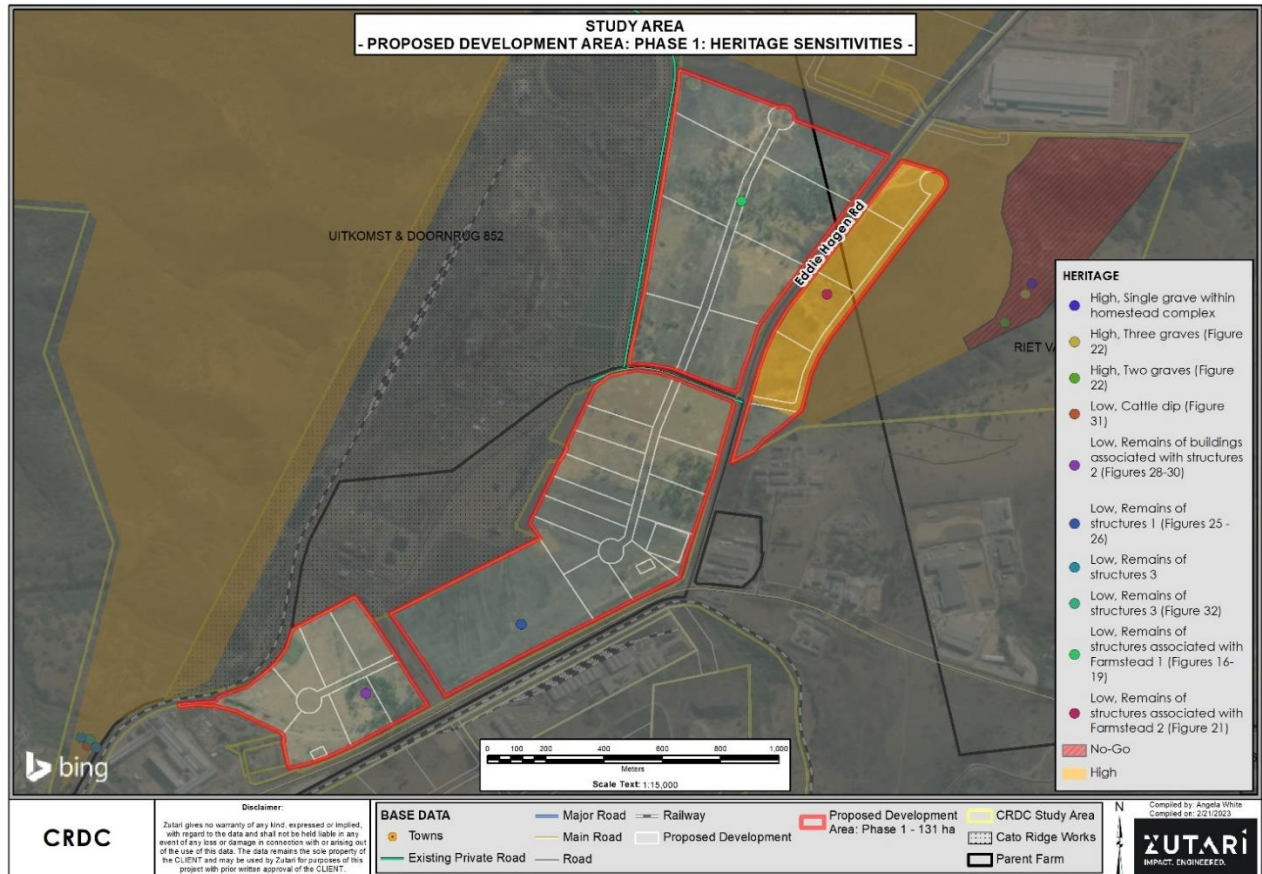


Figure 13: Phase 1 Heritage Sensitivities

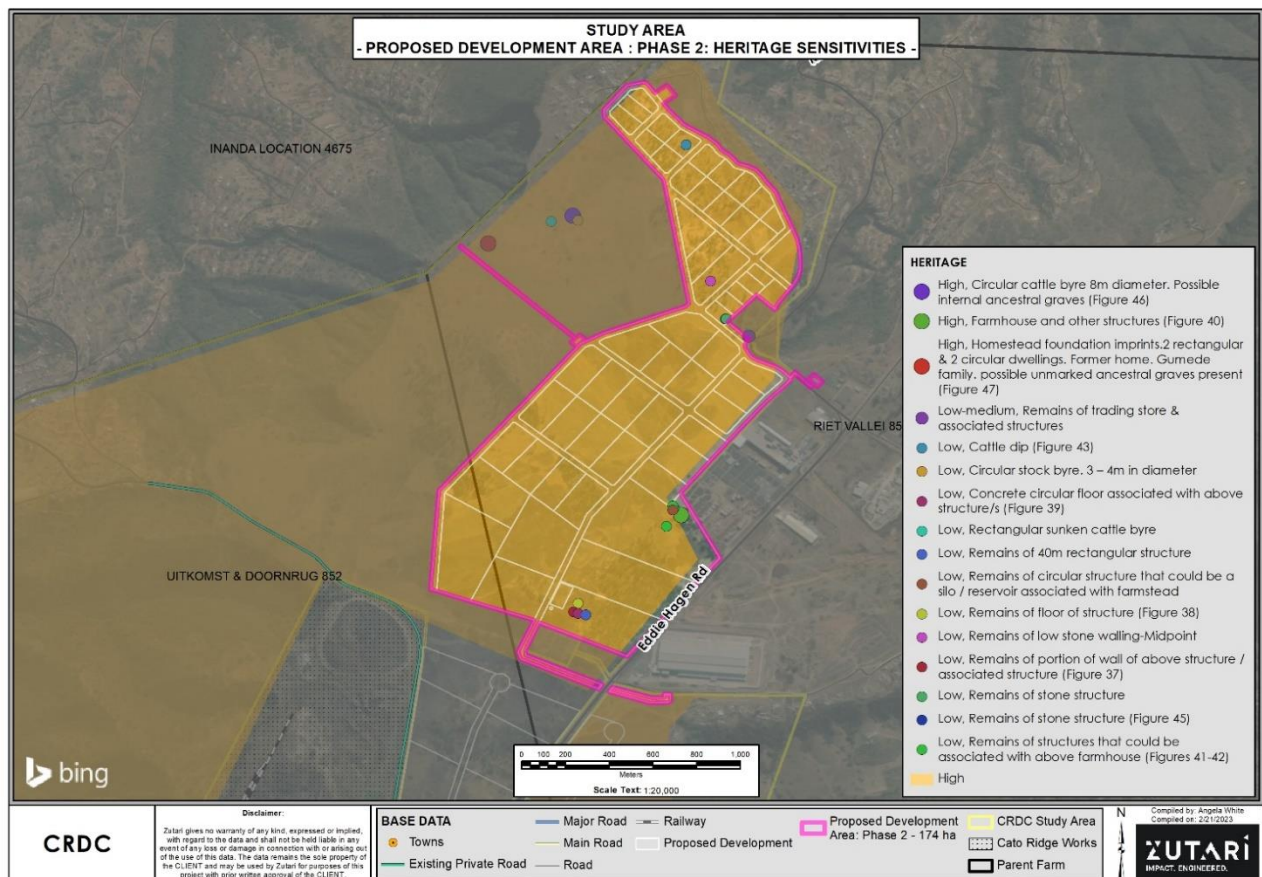


Figure 14: Phase 2 Heritage Sensitivities

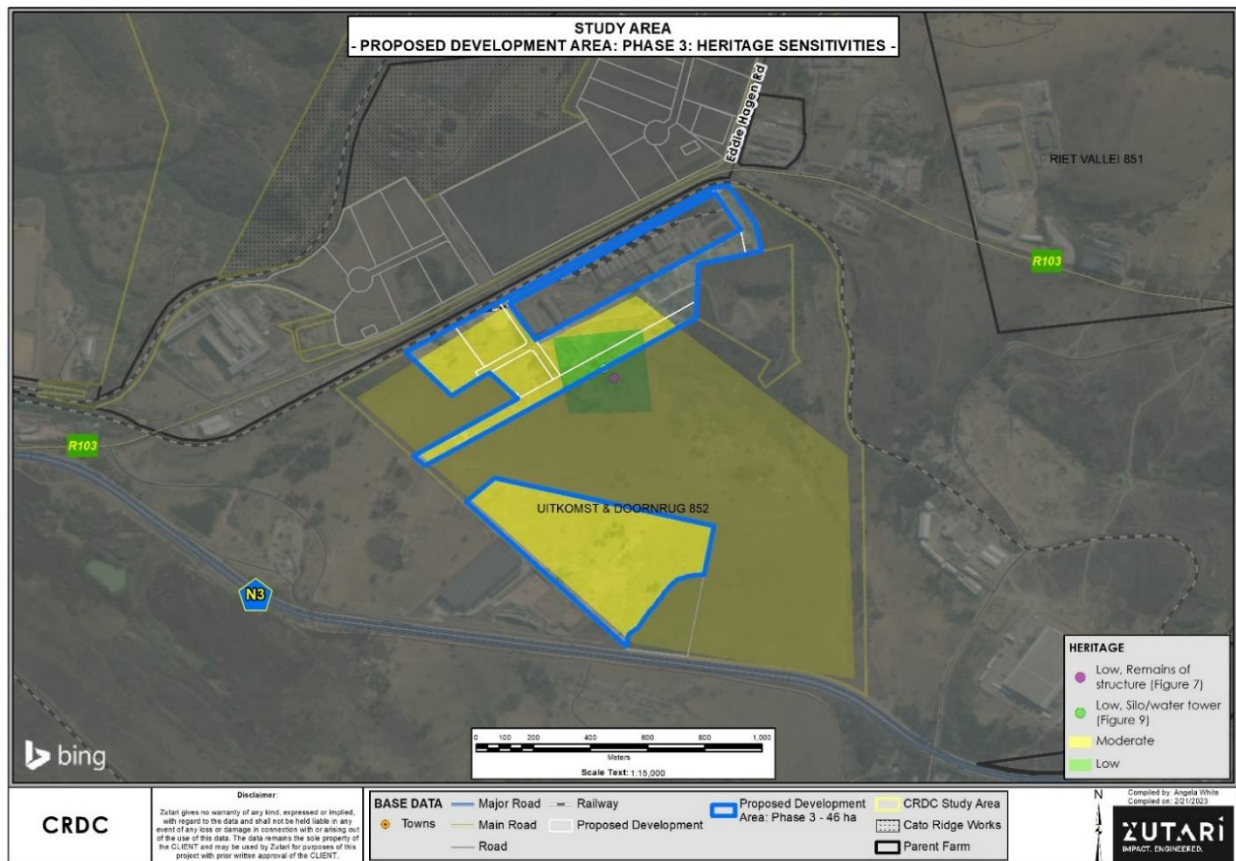


Figure 15: Phase 3 Heritage Sensitivities

Appendix 2 – DFFE Generic EMPr for substation

Appendix 3 – DFFE Generic EMPr for Overhead Powerlines

In diversity there is beauty and
there is strength.

MAYA ANGELOU

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