



# ENVIRONMENTAL MANAGEMENT & MAINTENANCE PROGRAMME

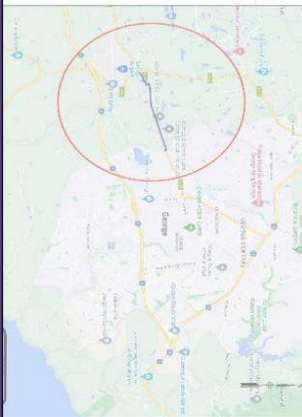
## for AIRPORT WATER PIPELINE

on  
RE/464, 113/208, 65/208, 112/208, 44/208, RE/102/208, 45/208,  
96/208, 139/208, 53/208, 132/208, 131/208, 68/208 George,  
Western Cape Province

In terms of the  
National Environmental Management Act (Act No. 107 of  
1998, as amended) & 2014 Environmental Impact  
Regulations (as amended)

**Prepared for Applicant:** George Municipality

**Date:** 8 November 2024



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**PURPOSE OF THIS REPORT:**

Environmental Management &amp; Maintenance Programme

**APPLICANT:**

George Municipality

**CAPE EAPRAC REFERENCE NO:**

GEO744b/07

**SUBMISSION DATE**

08 November 2024

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Environmental Impact Regulations (as amended)

*Submitted for:*

*Stakeholder Review & Comment*

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## ORDER OF REPORT

Environmental Management Plan

- Appendix 1 : Locality Plans
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## ENVIRONMENTAL MANAGEMENT PROGRAMME REQUIREMENTS

Appendix 4 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Management Programme (EMPr). The checklist below serves as a summary of how these requirements were incorporated into this EMPr.

Table 1: Checklist in terms of Appendix 4 of Regulation 982 of 2014 EIA Regulations

Requirement	Description
Details and expertise of the EAP who prepared the EMPr; including curriculum vitae.	Ms Louise-Mari van Zyl for Cape Environmental Assessment Practitioners. See Appendix 4.
A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	<u>Section 1</u>
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 must be avoided, including buffers	Appendix 1
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 the phases of the development including – (i) Planning and design; (ii) Pre-construction activities; (iii) Construction activities; (iv) Rehabilitation of the environment after construction and where applicable post closure; and (v) Where relevant, operation activities.	<u>Section 4</u> – Environmental Impacts & Mitigations <u>Section 5</u> - Responsibilities <u>Section 6</u> – Pre-Construction Design <u>Section 7</u> – Construction Phase <u>Section 8</u> – Operation Phase
A description and identification of impact management outcomes required for the aspects contemplated above.	<u>Section 4</u>
A description of the proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated above will be achieved and must, where applicable include actions to – (i) Avoid, modify, remedy control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Comply with any prescribed environmental management standards or practises; (iii) Comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.	<u>Section 4</u> <u>Section 6</u> <u>Section 7</u> <u>Section 8</u>
The method of monitoring the implementation of the impact management actions contemplated above.	<u>Section 9</u> <u>Section 11</u>
The frequency of monitoring the implementation of the impact management actions contemplated above.	<u>Section 9</u>

Requirement	Description
An indication of the persons who will be responsible for the implementation of the impact management actions.	<u>Section 5</u>
The time periods within which the impact management actions must be implemented.	Not Applicable
The mechanism for monitoring compliance with the impact management actions.	<u>Section 9</u>
A program for reporting on compliance, taking into account the requirements as prescribed in the Regulations.	<u>Section 9</u>
<p>An environmental awareness plan describing the manner in which –</p> <p>(i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and</p> <p>(ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.</p>	<p><u>Section 5</u></p> <p><u>Section 6</u></p> <p><u>Section 7</u></p> <p><u>Section 8</u></p> <p><u>Section 9</u></p>
Any specific information that may be required by the competent authority.	Not Applicable.

## ABBREVIATIONS AND ACRONYMS

<b>BSP</b>	Biodiversity Sector Plan - to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity.
<b>CARA</b>	Conservation of Agricultural Resources Act (Act 43 of 1983) - provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.
<b>CBA</b>	Critical Biodiversity Area - areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan.
<b>DFFE</b>	National Department of Forestry, Fisheries & the Environment – the national authority responsible for the sustainable environmental management and integrated planning.
<b>DEA&amp;DP</b>	Department of Environmental Affairs and Development Planning – the provincial authority for sustainable environmental management and integrated development planning. The competent authority is this case.
<b>DWS</b>	Department of Water & Sanitation Affairs – National authority mandated to enforce the National Water Act (NWA).
<b>EA</b>	Environmental Authorisation – Authorisation obtained on completion of an Environmental Impact Assessment in terms of the National Environmental Management Act (NEMA).
<b>ECA</b>	Environment Conservation Act, 1989 - To provide for the effective protection and controlled utilization of the environment and for matters incidental thereto.
<b>ECO</b>	Ecological Control Officer – independent site agent appointed to observe and enforce the implementation of environmental policies and principles on a development site.
<b>EIA</b>	Environmental Impact Assessment - a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.
<b>EMPr</b>	Environmental Management Programme – 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 positive benefits of the projects are enhanced.
<b>GIS</b>	Geographic Information System - system designed to capture, store, manipulate, analyse, manage, and present all types of geographical data.
<b>GPS</b>	Global Positioning System - a radio navigation system that allows land, sea, and airborne users to determine their exact location, velocity, and time 24 hours a day, in all weather conditions, anywhere in the world.
<b>NEMA</b>	National Environmental Management Act (Act 107 of 1998, as amended) – national legislation that provides principles for decision-making on matters that affect the environment.



- NEM:BA** National Environmental Management: Biodiversity Act (Act No.10 of 2004) – provides for the management and conservation of South African biodiversity within the framework of NEMA.
- NFA** National Forestry Act (Act No.84 of 1998) - provides for the protection of forests, as well as specific tree species within South Africa.
- NSBA** National Spatial Biodiversity Assessment – aims to assess the state of South Africa’s biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors.
- NWA** National Water Act (Act No.36 of 1998) - ensures that South Africa's water resources are protected, used and managed.

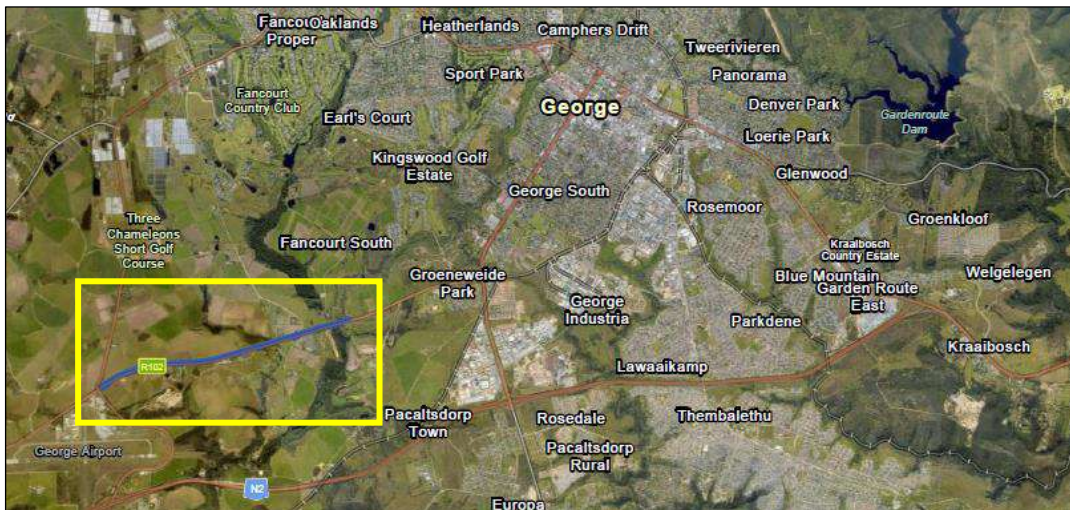
# 1. INTRODUCTION

The proposed project entails the **installation of a water pipeline** along the R102 towards George Airport (Figure 1– Yellow Box) as a replace-upgrade to cater for current and future demands and to supply water to the new Airport Precinct development.

The Airport Precinct in George, existing users and additional areas such as Herold’s Bay, are supplied with water through an existing 200mm diameter pipeline along the R102. It is the intention of the Applicant, George Municipality, to replace approximately 3.7km of this pipeline with a greater capacity pipeline, which will vary in diameter from 250mm – 400mm (Figure 1).

Note that this replacement is not like-for-like since the existing 200mm pipeline will need to provide continued water supply, until the new pipeline section is fully operational. The existing pipeline will therefore not be removed from its current position once the new line is installed.

The proposed water pipeline extends just east of Gwaing River Bridge to George Airport (Figure 1 – Yellow Box). Most of the pipeline section will be installed within the 5m building line of adjacent private properties north of the R102. However, a few shorter sections are also proposed on the south side of the R102 in a similar manner to account for constraints/environmental features (Figure 1).



**Figure 1: Locality map of the proposed section of the water pipeline (blue solid line within yellow box) along the R102 from the Gwaing Bridge towards George Airport.**

This activity requires an Environmental Authorisation in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) before commencing. This document provides part of a series of documents that is being circulated for public and stakeholder input as part of the Environmental Impact Assessment (EIA) process, before being provided to the provincial competent authority, the provincial Department of Environmental Affairs & Development Planning (DEA&DP) for decision making.

This EMPr contains **management requirements** and **recommendations** made by *Cape EAPrac*, the appointed specialist as well as in terms of the regulations contained in the **National Environmental Management Act** (NEMA, Act 107 of 1998), and best practice principles. The EMPr must be updated to include any conditions of the **Environmental Authorisation** (EA) as issued.

## **1.1 PURPOSE OF THE EMPr**

The purpose of this EMPr is to ensure that the environmental impacts and management of the various phases, of the proposed activity, on the receiving environment are managed, mitigated and kept to a minimum (i.e. the **outcome** of implementing the EMMPr). The EMMPr must provide easily understood and clearly defined **actions** that must be implemented during each phase of the proposed activity. The EMPr is a dynamic document that is flexible and responsive to new and changing circumstances.

The document is binding on the Applicant (George Municipality), all contractors and sub-contractors to the site. It must be included as part of any documents / agreements, as well as contractual documents between the Applicant and any contractors. Copies of this EMMPr must be kept on site and all **senior personnel** are expected to familiarise themselves with the content of this EMMPr.

Any changes or deviations to this EMMPr must be authorised by the competent authority.

## **1.2 STATUS OF THE EMPr**

It is of utmost importance that this EMMPr be read in conjunction with any legally obtained authorisations such as an Environmental Authorisation (EA). This EMMPr is viewed as a dynamic document that must be reviewed and updated on a continual basis.

The EMMPr is valid for the duration of the project with each applicable phase corresponding to the identified requirements.

## **2. EMMPR PHASING**

### **2.1 PRE-CONSTRUCTION PHASE**

The pre-construction phase refers to the design phase of the project. This will ensure that any requirements and best practise mechanisms are built into the planning / design phase to be developed in the construction and operational phase. In term of this application, the pre-construction can be considered as the site selection and engineering designs and mitigations.

### **2.2 CONSTRUCTION PHASE**

The construction phase refers to the actual installation of the water pipeline and associated infrastructure.

### **2.3 OPERATIONAL PHASE**

The Operation Phase of this project relates to the ongoing management required to ensure sustainable development. In terms of this application, this phase includes the inspections, maintenance and repair of the water pipeline associated infrastructure (i.e., maintenance and replacement of large fittings).

The Applicant must ensure that the Operational Phase maintains the underpinning principles 'Duty-of-Care-to-the-Environment' and ideals of sustainable development.

Maintenance of the structure, once installed, must be undertaken in accordance with this management & maintenance plan.

## **2.4 CLOSURE AND DECOMMISSIONING PHASE**

Decommissioning refers to the process of removing the operating assets of any development after completion of the operating life cycle.

The decommissioning phase is not applicable. The Airport Precinct in George, existing users and additional areas such as Herold's Bay, are supplied with water through an **existing** 200mm diameter **pipeline** along the R102. It is the intention of the Applicant, George Municipality, to replace approximately 3.7km of this pipeline with a greater capacity pipeline, which will vary in diameter from 250mm – 400mm. The existing 200mm diameter pipeline will not be removed from its current position once the new line is installed. The existing pipeline must remain fully operational to provide continued water supply during the construction phase of the new water pipeline.

## **3 LEGISLATIVE REQUIREMENTS**

The project Applicant is required to comply with all necessary legislation and policies applicable to development and management of the development. These include but are not limited to:

### **3.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA, ACT 107 OF 1998 )**

The National Environmental Management Act (**NEMA**, Act 107 of 1998, as amended), makes provision for the identification and assessment of **activities** that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the provincial Department of Environmental Affairs & Development Planning (DEA&DP)) based on the findings of an Environmental Impact Assessment (EIA).

**NEMA** embraces the notion of sustainable development as contained in the Constitution of South Africa (Act 106 of 1996) in that everyone has the right:

- to an environment that is not harmful to their health or wellbeing; and
- to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.

**NEMA** aims to provide for cooperative environmental governance by establishing principles for decision-making on all matters relating to the environment and by means of Environmental Implementation Plans (EIP) and Environmental Management Plans/Programmes (EMPr), of which this EMPr is one.

Principles contained in Section 2 of the NEMA, amongst other things, prescribe that environmental management must:

- In order of priority aim to: avoid, minimise or remedy disturbance of ecosystems and loss of biodiversity;
- Avoid degradation of the environment and avoid jeopardising ecosystem integrity;
- Pursue the best practicable environmental option by means of integrated environmental management;
- Protect the environment as the people's common heritage;
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic or stressed ecosystems.

It is incumbent upon the landowner, to ensure that the abovementioned principles, entrenched in this EMP are upheld and complied with.

### **3.2 ENVIRONMENT CONSERVATION ACT, 1989 (ECA)**

The EIA regulations contained in the Environmental Conservation Act (ECA) have been replaced by NEMA. However, property owners must comply with the draft regulations pertaining to noise as published in the province of Western Cape Provincial Extraordinary Gazette as provision made in section 25 of the ECA), as well as Section 24 of the ECA regarding waste management and Section 20 of the ECA dealing with waste management under Part IV, Control of Environmental Pollution.

### **3.3 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (NEM:BA) (ACT 10 OF 2004)**

This Act controls the management and conservation of South African biodiversity within the framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically make provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing, significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

The National List of Threatened Ecosystems (Notice 1477 of 2009, Government Gazette No. 32689, 6 November 2009) was gazetted in 2014. The list of threatened terrestrial ecosystems supersedes the information regarding terrestrial ecosystem status in the National Spatial Biodiversity Assessment (NSBA) 2004 & 2011.

According to the independent SACNASP registered botanist, no plant SCC or protected tree species were observed within the area where the proposed pipeline will be installed (including the 10m working area) for all route alternatives. The proposed site does **not represent Garden Route Granite Fynbos**. Sections of **degraded** and **invaded fynbos** are present in small patches, but none of these patches will be affected by the proposed pipeline. According to the botanist, the impact of this project on CBA and ESA areas will not counter the objectives of these areas and the vegetation along the entire section of the R102 is currently used as agricultural fields.

According to the independent SACNASP registered faunal specialist, the project area is mostly comprised of **transformed habitat**, with little to no natural vegetation. This is largely due to agriculture (grazing). Other habitat modifications observed are due to dense alien plant invasion.

### **3.4 NATIONAL WASTE MANAGEMENT STRATEGY**

The National Waste Management Strategy presents the South African government's strategy for integrated waste management for South Africa.

It deals among others with: Integrated Waste Management Planning, Waste Information Systems, Waste Minimisation, Recycling, Waste Collection and Transportation, Waste Treatment, Waste Disposal and Implementing Instruments.

It is advisable that an integrated waste management system be adopted, which includes waste minimisation, waste recycling and the proper storage and disposal of waste, which does not impact of the health of the environment and human health.

All waste must be collected and disposed of at a waste facility.

### **3.5 NATIONAL WATER ACT (NWA, ACT 36 OF 1998)**

The National Water Act (NWA) gives effect to the constitutional right of access to water. The Act's overall purpose is to ensure that South Africa's water resources are protected, used and managed in ways which take into account a number of factors, including inter-generational equity, equitable access, redressing the results of past racial and gender discrimination, promoting sustainable and beneficial use, facilitating social and economic development, and providing for water quality and environmental protection.

The NWA makes persons who own, control, occupy or use land responsible for taking measures to prevent pollution of water resources, and empowers Government authorities to take measures to enforce this obligation.

According to the independent SACANSF registered aquatic specialist (Dr Jackie Dabrowski – Confluent Environmental), the proposed pipeline crosses **four (4) watercourses** (Gwaing River, Norga River, Seep Wetland and Dam). These watercourses have already been impacted not only by the initial disturbance for installing existing pipelines and periodic maintenance, but by the presence of the road (R102).

The aquatic specialist **confirms** the **very high** aquatic sensitivity. An **Aquatic Impact Assessment** is submitted with the BAR (Appendix G3).

The aquatic specialist also compiled a Risk Matrix to determine whether a GA (Low Risk) or WULA would be applicable. The Risk Matrix determined that the impacts were of **Low Risk** to potentially affected watercourses.

An application for registration of water use(s) within the ambit of a **General Authorisation** in terms of section 39 of the national water act, 1998 (Act 36 of 1998), is in the process of being submitted.

### **3.6 NATIONAL FOREST ACT (ACT 84 OF 1998)**

The NFA provides for the **protection of forests**, as well as **specific tree species**, quoting directly from the Act: "no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated". The Department of Agriculture, Forestry & Fisheries (DAFF) is responsible for the implementation and enforcement of the NFA, which includes **prohibition of damage to indigenous trees in any natural forest without a licence** (Section 7 of the NFA), as well as the prohibition of the cutting, disturbing, damaging destroying or removing **protected trees** without a licence (Section 15 of the NFA).

No protected trees were found on site.

The purpose of the National Veld and Forest Fire Act is to **prevent and combat veld, forest and mountain fires** throughout the RSA and to provide institutions, methods and practices for achieving this purpose. Institutions include the formations of such bodies as **Fire Protection Associations** (FPA's) and **Working on Fire**. The Act provides the guidelines and constitution for the implementation of these institutions as well as their functions and requirements.

The proposed activity is not applicable to the National Veld and Forest Fire Act.



### **3.7 NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)**

The purpose of the National Heritage Resources Act is to:

- Introduce an integrated and interactive system for the management of the national heritage resources;
- Promote good government at all levels,
- Empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations;
- To lay down general principles for governing heritage resources management throughout South Africa;
- To introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa;
- To establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources at national level;
- To set norms and maintain essential national standards for the management of heritage resources in South Africa and to protect heritage resources of national significance;
- To control the export of nationally significant heritage objects and the import into South Africa of cultural property illegally exported from foreign countries;
- To enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources;
- To provide for the protection and management of conservation-worthy places and areas by local authorities; and
- To provide for matters connected therewith.

The proposed development triggers the following activity set out in Section 38(1) of the National Heritage Resources Act:

38. (1)(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.

Perception Planning submitted a Notice of Intent to Develop to Heritage Western Cape who confirmed that no additional studies are required.

### **3.8 OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993)**

The Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.

In terms of this Act, a Health and Safety Officer and Protocol must be implemented on any sites. The appointment of a Health and Safety Officer is the responsibility of the proponent and contractor and is included in this report to ensure due diligence on construction sites. It is the responsibility of the appointed HSO to conduct any required audits and as such only the appointment of an HSO will be auditable in terms of this document.

## 4 ENVIRONMENTAL IMPACTS & MITIGATIONS

The following specialist impact assessments / studies were undertaken for the proposal:

- Aquatic Impact Assessment
- Faunal Compliance Statement
- Botanical & Biodiversity Compliance Statement
- Agriculture Compliance Statement
- Heritage Background Information Document

The following environmental impacts of the proposed activity were identified and considered during the EIA process, based on which the associated mitigation measures were recommended for implementation (to reduce negative impacts & enhance positive ones):

### Specialist Assessments/Compliance Statement

#### Potential Impacts

- Excessive disturbance to wetlands during construction
- Materials and vehicle management
- Stormwater runoff from disturbed areas
- Incomplete post-construction rehabilitation
- Invasive alien vegetation along the pipeline footprint
- Repairs and maintenance of the pipeline

### 4.1 MITIGATIONS

Table 2: List of Mitigation Measures & Associated Management Requirements

Mitigation	Condition of Approval	Included in EMPr	Construction Phase	Operational Phase	Decommissioning Phase
<b>Mitigations / Recommendations</b>					
Applicant must appoint an ECO to oversee construction.	✓	✓	✓		
Prior to construction, the minimum footprint of disturbance must be delineated and should include vehicle access points, material stockpile areas, refuelling areas and actual work areas. The No-Go area must be delineated 5 m either side of the pipeline route. The delineated No-Go area must be indicated using construction mesh attached to wooden droppers or similar materials. Alternatively, danger tape or wooden stakes could be used if the previously mentioned materials could be stolen but is less effective.		✓	✓		
As far as possible the watercourse should be accessed from a single point only to reduce disturbance to features such as slopes and vegetation. At all crossings attempts should be made to limit access to the side of the watercourse only.		✓	✓		
Signage indicating No-Go areas must be printed and placed on fencing.		✓	✓		
All contractors must be briefed that vehicles, workers and materials may not encroach into No-Go areas in and around watercourses.		✓	✓		

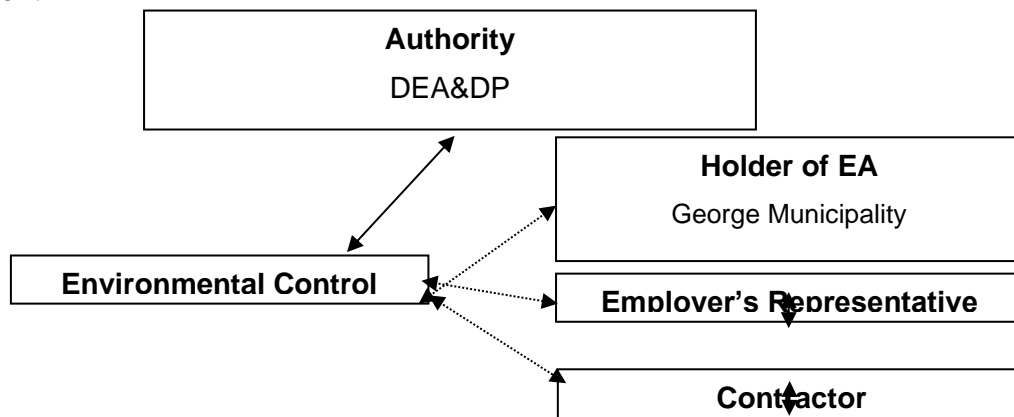
Mitigation	Condition of Approval	Included in EMPr	Construction Phase	Operational Phase	Decommissioning Phase
As far as possible, try to keep vehicles out of the watercourse, working from the banks from the inside towards the outside to minimise disturbance. Excavators/Backacters should operate from the maximum distance possible to reduce soil compaction and disturbance to vegetation.		✓	✓		
All construction materials (topsoil, subsoil, building sand) must be stockpiled as far from the watercourse or slope edge as practically possible.		✓	✓		
Materials to be removed must be taken away without delay to reduce the risk of washing into wetlands.		✓	✓		
Retain the upper 30cm of topsoil including vegetation during grubbing. This material should be stockpiled separately to other materials, kept uncontaminated, and protected with shade cloth and bunding.		✓	✓		
There is limited space to work along the pipeline route, and stockpiled materials must not be placed in a way that they force vehicles to move around them into sensitive wetland habitat.		✓	✓		
Vehicle refuelling areas must be located as far from wetlands as possible, and a spill kit must be on hand in case of fuel spills.		✓	✓		
Vehicles leaking fuel (diesel or oil) may not be permitted to work on site.		✓			
No materials may be dumped into the watercourse.		✓	✓		
Weekly and daily checks for predicted rainfall. Proactive steps to be taken in response to predicted rainfall.		✓	✓		
Do not continue work during rainfall (when working in close proximity to the water courses), and ensure the site is prepared to minimise erosion and sediment-laden runoff in advance of rainfall.		✓	✓		
The site office / vehicle should have a store of materials suitable for rapid preparation and response to rainfall such as shade-cloth (silt-fencing & check dams), wooden droppers, sandbags, hessian fabric, and fencing wire.		✓	✓		
All material stores should be kept on flat areas and be bunded to prevent material loss during rainfall.		✓	✓		
Soil from the trench for installation of the pipeline should be preferably placed on the upslope side of the trench so it washes back into it in the event of rain, and not down the slope to wetland habitat. Alternatively, short lengths of trenching must be undertaken at a time when rainfall is predicted to reduce the risk of soil washing downslope.		✓	✓		
Monitor the site during / following periods of rainfall and install check dams at points where runoff collects using sandbags and haybales with hessian or shade cloth (90%).		✓	✓		
Following rainfall, water pumped out of trenches or other excavations must not be directed to the watercourse. A temporary coffer dam can be created using shadecloth as a filter material to contain silt-laden water which can then flow through vegetation into the watercourse where feasible.		✓	✓		
Ensure all soil surfaces are reshaped to avoid preferential flow paths and very steep gradients.		✓	✓	✓	

Mitigation	Condition of Approval	Included in EMPr	Construction Phase	Operational Phase	Decommissioning Phase
All areas disturbed during the construction phase must have topsoil from the site mixed with indigenous grass seed ( <i>Stenotaphrum secundatum</i> and <i>Cynodon dactylon</i> ) replaced to a depth of 30 cm above subsoils.					
Where sloping areas occur it will be necessary to stake a cover of soil saver matting over the grass seed / top soil mix to prevent movement downslope until vegetation can establish.		✓	✓		
Alien vegetation must be removed 2 months and 6 months post replacement of the soil until the grass / indigenous vegetation is established.		✓	✓		
Ensure any litter from construction works or personnel is removed from the site. No litter, food scraps, or waste materials can be left at the site.		✓	✓		
The full length of the newly installed pipeline at each of the 4 watercourse crossing points must be inspected 6- and 12-months following completion of project by the site ECO. The purpose is to ensure disturbed areas are well vegetated with indigenous plants.		✓		✓	
If alien plants are present, it is necessary to appoint a contractor to remove them to ensure the pipeline footprint is clear of alien plants.		✓		✓	
Where the pipeline must be accessed for repairs or maintenance, the same footprint of disturbance applies as that described in the construction phase impact. I.e. 5 m either side of the pipeline.		✓		✓	
Any excessive sedimentation that has smothered plants in a wetland must be removed from the wetland by hand using spades, and contours must be reshaped to avoid concentrated flow paths.		✓		✓	
Renewed areas of disturbance must be grassed as per mitigation measures in the construction phase to ensure vegetation covers soil vulnerable to erosion or invasion with alien plants.		✓		✓	
Alien plants must be removed from the length of the pipeline in each watercourse while works are in progress.		✓		✓	
Soils excavated for the laying of the new pipes should be covered when not in use and must be re-used to fill the pipeline holes once the pipelines have been installed.		✓	✓		
Kikuyu grass may not be used to rehabilitate the road and fence line verges where the pipeline will be installed. Better grasses to use are <i>Cynodon dactylon</i> (bermuda grass) or <i>Stenotaphrum secundatum</i> (Saint Augustine grass).		✓	✓		
Adequate ablution facilities must be available for all construction staff working on the installation of the new pipeline (approximately one toilet per 10 construction workers).		✓	✓		
General recommendation and best practice guidelines should be followed for all animal species encountered (regardless of whether they are SCC or not) during any stage of development on a site.		✓	✓		
If any human remains or significant archaeological materials are exposed during development activities, then the find should be protected from further disturbance and work in the immediate area should be halted and Heritage Western Cape must be notified immediately. These heritage resources are protected by Section 36(3)(a) and Section 35(4) of the NHRA (Act 25 of 1999) respectively		✓	✓		

Mitigation	Condition of Approval	Included in EMPr	Construction Phase	Operational Phase	Decommissioning Phase
and may not be damaged or disturbed in any way without a permit from the heritage authorities. Any work in mitigation, if deemed appropriate, should be commissioned, and completed before construction continues in the affected area and will be at the expense of the developer.					
The subsoil must then be excavated and stockpiled <b>separately</b> from the topsoil stockpile.		✓	✓		
When the trench is refilled after the pipeline is installed, the subsoil must first be backfilled into the trench. Thereafter, the stockpiled topsoil must be evenly spread at the surface on top of the subsoil.		✓	✓		
The soil should be backfilled to be raised approximately 5 cm above the surface because it will settle over time and potentially create a water flow path with consequent erosion if it settles to form a depression.		✓	✓		
<b>Best Practise</b>					
Construction work must take place during normal work hours		✓	✓		
Traffic management must be in place during construction		✓	✓		

## 5 RESPONSIBILITIES

This section deals with the responsibilities of various parties during the Construction Phase of any development.



### 5.1 HOLDER OF THE EA

The holder of the EA / property owner is the overseeing entity responsible for ensuring that all activities undertaken on the property comply with the Environmental Authorisation (EA) and associated Environmental Management Programme (EMPr) (& any other approval / licence / permit), as well as the management and maintenance of the open space areas (protected vegetation).

The responsibilities of the holder of the EA / property owner include, but are not limited to the following:

- Ensure that **all tender documentation** include reference to, and the need for compliance with, the EA and EMPr as well as any other legally binding documentation, which include and are not limited to:
  - the Municipal Approval/s.

- Be conversant with, and ensure that all Contractors, Sub-contractors, Engineers (and future senior site managers / personnel) are made aware of, and understand the conditions and recommendations, contained in the abovementioned documentation;
- Ensure that all Contractors, Sub-contractors and Engineers (during construction activities) are made aware of their 'Duty of Care to the Environment' and that any damage or degradation of the natural environment within the bounds of the property will not be tolerated and must be dealt with / remedied at the cost of the perpetrator;
- Take remedial and/or disciplinary action in circumstances where persons are found to be in contravention of the abovementioned legally binding documentation.

## **5.2 ENGINEERS AND CONTRACTORS**

The Engineers and Contractors are often the parties responsible for physically carrying out the activities for which majority of the recommendations in this EMPr are intended. Service providers and Contractors include: services, building contractors, 'handy-men' and engineers overseeing the installation and maintenance of services etc. The responsibilities indicated here are also relevant to Sub-Contractors.

The responsibilities of these parties include but are not limited to the following:

- Be conversant and compliant with the EA, the EMPr, and any relevant License, Permit or any legally binding documentation relevant to their operations;
- Have a responsibility to adhering to any conditions and recommendations laid out in above mentioned documentation;
- Prevent actions that may cause harm to the environment;
- Be responsible for any remedial activities in response to an environmental incident within their scope of influence;
- Liaise with the holder of the EA in complying with the EMPr, and in the event that any industry regulated standards are in contradiction with the EMPr or any other authorisations.
- Review and amend to any construction activities to align with the EMPr and Best Practice Principles;
- Ensure compliance of all site personnel and / or visitors to the EMPr and any other authorisations.

**Contractors** are responsible to ensure that all sub-contractors are compliant with the EA, the EMPr, and any relevant licence, permit or any legally binding documentation relevant to their operations. It is recommended that contractors and sub-contractors use colour codes for easy identification by the Environmental Control Officer (i.e., colour coded hard hats or vests).

## **5.3 ECOLOGICAL CONTROL OFFICER (ECO)**

It is recommended that a suitably qualified Environmental Control Officer (ECO) be appointed to oversee all activities for the duration of the construction phase (i.e. construction activities, services, road works) as well as any maintenance work that must be undertaken that will involve earthworks or machine works. The ECO must have at least 3 years' experience and proven competency as an ECO.

The responsibilities of the ECO include but are not limited to the following:

- Provide environmental induction training to Contractors on site prior to construction activities commencing
- Provide maintenance, update and review of the EMPr if necessary;



- Liaison between the Project Holder of the EA, Contractors, Authorities and other lead stakeholders on all environmental concerns, including the implementation of the EMPr;
- Compilation of Environmental Control Reports (ECR) to ensure compliance with the EA, EMPr and duty of care requirements, where necessary;
- Compilation of the Environmental Audit Report or Environmental Completion Statement, after completion of construction (or as otherwise defined in the Environmental Authorisation), where necessary;
- Ensuring / guiding and monitoring compliance with the EA and EMPr and any legally binding documentation;
- Facilitating consultation with relevant environmental authorities (e.g. DEA&DP, DFFE, CapeNature or Municipality);
- Facilitating the application for any required environmental authorisation, permit or licence;
- Provide guidance and interpretation of the EA and EMPr where necessary;
- Issuing site instructions to the contractor for corrective actions required;
- The ECO is required to conduct regular site visits for the duration of the construction period, in order to ensure the Contractor receives the necessary induction and that all procedures are in place. Additional visits may be undertaken in the event of any unforeseen environmental accidents;
- The duration and frequency of these visits may be increased or decreased at the discretion of the ECO;
- Attendance of site meetings if required;
- Maintain a record of environmental incidents (e.g. spills, impacts, legal transgressions etc.) as well as corrective and preventative measures taken. This information must also be included in the ECR;
- Maintain a public complaints register in which all complaints and action taken must be recorded. This information must also be included in the ECR.

#### **5.4 ECO SITE VISIT FREQUENCY**

The following site frequency for ECO site visits has been determined:

- Weekly during the installation of the water pipeline & associated infrastructure;
- Weekly during rehabilitation.
- Maintenance activities must be monitored on an ad hoc basis depending on the type of maintenance/repair.

Ad hoc site visits may be undertaken in the event of any incidents or specific requests from the project holder of the EA or project team.

#### **5.5 POST-CONSTRUCTION MAINTENANCE**

- Repair and reinstate existing infrastructure that will be affected or damaged during construction.

#### **5.6 ENVIRONMENTAL INDUCTION & TRAINING**

The holder of the EA in consultation with the Contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EA and EMPr. The presentation shall be conducted, as far as is possible, in the employees' language of choice. The Contractor must provide a translator from their staff for the purpose of translating, if this is deemed necessary.

As a minimum, training must include:

- Explanation of the importance of complying with the EA and EMPr and the employees accountability;
- Discussion of the potential environmental impacts of construction activities;
- The benefits of improved personal performance;
- Employees’ roles and responsibilities, including emergency preparedness ;
- Explanation of the mitigation measures that must be implemented when carrying out their activities;
- Explanation of the specifics of this EMPr and its specification (no-go areas, etc.);
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.

Where staff turnover is high and with additional appointment of sub-contractors, it may be necessary to undertake additional induction training sessions. The Contractor must keep records of all environmental training sessions, including names, dates and the information presented.

**6 PRE-CONSTRUCTION DESIGN CONSIDERATIONS**

It is recommended that sustainable design considerations are implemented during the planning phase to ensure that the impacts associated with the development are avoided, minimised or managed before construction commences.

<b>6.1 <u>STORMWATER MANAGEMENT PREPARATION</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To prepare the site to minimise the negative impacts of stormwater			Damage to the environment caused by stormwater runoff		
<b>Management Actions</b>					
a. All stormwater measures (silt fences, straw bale check-dams) must be installed at areas prone to erosion / stormwater runoff before work commences.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method Statement	As required	Engineer / Contractor	Prior to construction	Audit	Monthly

<b>6.2 DEMARCATION OF WORK AND NO-GO AREAS</b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To clearly define the work area and avoid impacting on non-works areas.			Negative construction impacts on natural and rehabilitated areas		
<b>Management Actions</b>					
a. Clearly identify and demarcate the development footprint, area of works and spoiling areas.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method Statement	Once off	Developer / contractor	Pre implementation	Audit	Once off
b. Fuel and chemicals may only be stored in a designated work area.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method Statement	Once off	Developer / contractor	Pre implementation	Audit	Once off
c. Provide on-site sanitation and rest areas for personnel.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method Statement	Once off	Developer / contractor	Pre implementation	Audit	Once off

## 7 CONSTRUCTION CONSIDERATIONS

These Construction Phase requirements are aimed at using Best Practise Principles and / or specialist recommendations to manage the impacts on the environment during the construction of the development.

<b>7.1 <u>STORMWATER MANAGEMENT</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To minimise the generation of contaminated stormwater.			Minimise sedimentation, erosion and / or undercutting		
<b>Management Actions</b>					
<ul style="list-style-type: none"> <li>d. Weekly and daily checks for predicted rainfall. Proactive steps to be taken in response to predicted rainfall.</li> <li>e. Do not continue work (in proximity to watercourses) during rainfall, and ensure the site is prepared to minimise erosion and sediment-laden runoff in advance of rainfall.</li> <li>f. The site office / vehicle should have a store of materials suitable for rapid preparation and response to rainfall such as shade-cloth (silt-fencing &amp; check dams), wooden droppers, sandbags, hessian fabric, and fencing wire.</li> <li>g. All material stores should be kept on flat areas and be bunded to prevent material loss during rainfall.</li> <li>h. Soil from the trench for installation of the pipeline should be preferably placed on the upslope side of the trench so it washes back into it in the event of rain, and not down the slope to wetland habitat. Alternatively, short lengths of trenching must be undertaken at a time when rainfall is predicted to reduce the risk of soil washing downslope.</li> <li>i. Monitor the site during / following periods of rainfall and install check dams at points where runoff collects using sandbags and haybales with hessian or shade cloth (90%).</li> <li>j. Following rainfall, water pumped out of trenches or other excavations must not be directed to the watercourse. A temporary coffer dam can be created using shade cloth as a filter material to contain silt-laden water which can then flow through vegetation into the watercourse where feasible.</li> </ul>					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method Statement	Daily/Weekly	Developer / contractor	Implementation	Audit	As required
Any areas that are identified by the ECO as being prone to erosion must be suitably protected. During construction, the contractor shall protect all areas susceptible to erosion by installing temporary works (e.g., sandbags) and by taking any other measures necessary to prevent stormwater from concentrating in streams and scouring slopes, banks, etc.					

In areas where construction activities have been completed and where no further disturbance would take place, rehabilitation and re-vegetation should commence as soon as possible. A suitable rehabilitation method statement must be submitted to the ECO for approval.

**7.2 DUST CONTROL**

Management Statement	Impacts & Risks Avoided
To ensure there is no health risk or loss of amenity due to emission of dust to the environment.	Ensure land coverage with biomass chips / vegetation / damping to minimise dust

**Management Actions**

a. Implement a dust prevention strategy, developed at the project planning stage

Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method Statement	Weekly	Developer / contractor	Pre implementation	Audit	As required

The strategy should include the following amongst others:

- Speed control to minimise dust on site.
- Exposed stockpile materials must be adequately **protected** against wind (covered) and should be sited taking into consideration the prevailing wind conditions.
- Trucks bringing in materials must be covered to prevent dust and small particles escaping and potentially causing damage to people and property.

**7.3 NOISE**

Management Statement	Impacts & Risks Avoided
To ensure nuisance from noise and vibration does not occur.	Nuisance impacts to neighbours and visitors.

**Management Actions**

a. Fit and maintain appropriate mufflers on earth-moving and other vehicles on the site.

Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance

As required	Initially when vehicle or machinery is introduced to the site and thereafter monthly. As required if complaints registered.	Contractor	During construction and operation	Audit	As required
b. Enclose noisy equipment such as generators and pumps.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
As required	Initially when vehicle or machinery is introduced to the site and thereafter monthly. As required if complaints registered.	Contractor	During construction	Audit	As required
c. Provide noise attenuation screens, where appropriate.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
As required	Initially when vehicle or machinery is introduced to the site and thereafter monthly. As required if complaints registered.	Contractor	During construction	Audit	As required
d. Where an activity is likely to cause a noise nuisance to nearby residents, restrict operating hours to between 7 am and 6 pm weekdays and 7 am to 1 pm Saturday, except where, for practical reasons, the activity is unavoidable.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance



As required	As required if complaints registered.	Contractor	During construction	Audit	As required
<b>7.4 <u>TRAFFIC CONTROL</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To manage and minimise the nuisance effect created by construction traffic.			The development entrance access will be via Grens Street and construction traffic is likely to temporarily affect users.		
<b>Management Actions</b>					
a. Implement a traffic management strategy during construction.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method Statement	Daily	Contractor	During construction	Audit	As required
<ul style="list-style-type: none"> <li>• Construction related activities should be timed where possible to avoid peak periods.</li> <li>• No construction workers, apart from security personnel, should be allowed to stay on site overnight.</li> <li>• Contractors appointed by the developer must ensure that workers are transported to and from the site daily.</li> <li>• Construction related activities should comply with all relevant building regulations. In this regard activities on site should be restricted to between 07h00 and 18h00 during weekdays and 08h00 and 13h00 on Saturdays. No work should be permitted after 13h00 on Saturdays and on Sundays.</li> <li>• Temporary access to be rehabilitated once construction is complete.</li> </ul>					
<b>7.5 <u>WASTE MANAGEMENT</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To minimise the waste load discharged to the environment.			Improve waste disposal methods during construction Reduce waste volumes to landfill sites		
<b>Management Actions</b>					
a. Reduce wastes by selecting, in order of preference, avoidance, reduction, reuse and recycling.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance

		management action			
Record of volumes of material removed	As required	Contractor	As required	Audit	Records
b. Maintain a high quality of housekeeping and ensure that materials are not left where they can be washed or blown away to become litter.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Photographic	Weekly	Contractor	As required	Audit	Records
c. Provide bins for construction workers and staff at locations where they consume food. Ensure any litter from construction works or personnel is removed from the site. No litter, food scraps, or waste materials can be left at the site.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Photographic	Weekly	Contractor	As required	Audit	Records
d. Conduct ongoing awareness with staff of the need to avoid littering.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Induction	Once off	Contractor	As required	Audit	Attendance register
<b>7.6 STOCKPILE MANAGEMENT</b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To manage soil stockpiles so that dust and sediment in run-off are minimised.			Pollution due to dust and sediment run off		
<b>Management Actions</b>					

a. Minimise the number of stockpiles, and the area and the time stockpiles are exposed.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Photographic	As required	Contractor	As required	Audit	Records
b. Keep topsoil and underburden stockpiles separate.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual inspection of stockpiles	Daily when stripping topsoil	Contractor	Continuously during construction	Audit	Records
c. Ensure that stockpiles and batters are designed with slopes no greater than 2:1 (horizontal/vertical).					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual inspection of stockpiles	As required	Contractor	Continuously during construction	Audit	Monthly
d. Stabilise stockpiles and batters that will remain bare for more than 28 days by covering with mulch or anchored fabrics or seeding with sterile grass.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual inspection of stockpiles	As required	Contractor	Continuously during construction	Audit	Monthly

e. Establish sediment controls around unstabilised stockpiles and batters.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual inspection of stockpiles	As required	Contractor	Continuously during construction	Audit	Monthly
f. Suppress dust on stockpiles and batters, as circumstances demand.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual inspection of stockpiles	As required	Contractor	Continuously during construction	Audit	Monthly
<b>7.7 <u>STORING FUELS &amp; CHEMICALS</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To ensure that fuel and chemical storage is safe, and that any materials that escape do not cause environmental damage.			Avoid hydrocarbon pollution to soil and watercourses / coastal environments		
<b>Management Actions</b>					
a. Minimise fuels and chemicals stored onsite.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Method statement records

b. Install bunds and take other precautions to reduce the risk of spills.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Method statement records
c. Implement a contingency plan to handle spills, so that environmental damage is avoided.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Method statement records
d. All construction materials (topsoil, subsoil, building sand) must be stockpiled as far from the watercourse or slope edge as practically possible.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Monthly
<b>7.8 <u>MINIMISING EROSION</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To minimise the quantity of soil lost during construction due to land-clearing.			<ul style="list-style-type: none"> <li>Avoid overland flow by capture and store water from roof</li> <li>Avoid siltation by installing silt traps</li> </ul>		
<b>Management Actions</b>					

a. Schedule measures to avoid and reduce erosion by phasing the work program to minimise land disturbance in the planning and design stage.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Method statement records
b. Keep the areas of land cleared to a minimum, and the period areas remain cleared to a minimum					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Method statement records
c. Base control measures to manage erosion on the vulnerability of cleared land to soil loss, paying particular attention to protecting slopes.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Method statement records
d. Mulch, roughen and seed cleared slopes and stockpiles where no works are planned for more than 28 days, with sterile grasses.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor	As required	Audit	Method statement records

e. Keep vehicles to well-defined haul roads.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Site plan	As required	Contractor	As required	Audit	Final site plan
f. Rehabilitate cleared areas promptly.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual / photographic	As required	Contractor	Continuously during construction	Audit	Final Rehabilitation statement
<b>7.9 <u>FAUNA MANAGEMENT</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To ensure that impacts to native faunal species is minimised and / or avoided.			To minimise the impact to fauna		
<b>Management Actions</b>					
a. General recommendation and best practice guidelines should be followed for all animal species encountered (regardless of whether they are SCC or not).					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Ad hoc	As required	Contractor	Continuously	Audit	Visual / photographic
<b>7.10 <u>SOCIAL REQUIREMENTS</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		

To ensure equitable, fair and safe social interaction on construction sites			Loss of employment opportunities to the region		
<b>Management Actions</b>					
a. It is strongly recommended that the Contractor make use of local labour as far as possible for the construction phase of the project.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Employment records	Ad hoc	Contractor	Ad hoc	Audit	Once off
b. Theft and other crime associated with construction sites is not only a concern for surrounding residents, but also the Developer and the Contractor.					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Site records	Ad hoc	Contractor	Ad hoc	Audit	Once off
<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>- The contractor should endeavour to source local suppliers.</li> <li>- The contractor must ensure that suitable procurement policies are in place that supports local economic growth.</li> <li>- Locally manufactured products must be used as far as possible.</li> </ul> <p><b>Site Security</b></p> <p>Theft and other crime associated with construction sites is not only a concern for surrounding residents, but also the developer and the contractor.</p> <p>Considering this, contractors need to be proactive in order to curtail theft and crime on and resulting from the construction site. It is recommended that the contractor develop a jobsite security plan prior to commencement of construction. This jobsite security plan should take into account protection of the construction site from both internal and external crime elements as well as the protection of surrounding communities from internal crime elements. All incidents of theft or other crime should be reported to the South African Police Service, no matter how seemingly insignificant.</p>					
<b>7.11 <u>METHOD STATEMENTS</u></b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		



To ensure efficient communication mechanisms in the implementation of environmental performance requirements	Prevention of potential impacts are avoided during construction by means of correct communication
--	---

**Management Actions**

a. Method statements are written submissions by the Contractor to the ECO in response to the requirements of this EMPr or to a request by the ECO. The Contractor shall be required to prepare method statements for several specific construction activities and/or environmental management aspects.

Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	Ad hoc	Contractor	As required	Audit	Once off

Based on the specifications in this EMPr, the following method statements are required as a minimum (more method statements may be requested as required at any time under the direction of the ECO):

- Demarcation of No-Go areas
- Site clearing
- Hazardous substances and their storage.
- Materials requirements & Sourcing.
- Solid waste control system.
- Fire control and emergency procedures
- Petroleum, chemical, harmful and hazardous materials storage, if any.
- Beach work schedule and duration.
- Stormwater Management and Erosion Control.

**7.12 POST-CONSTRUCTION REHABILITATION**

Management Statement	Impacts & Risks Avoided
To ensure that degradation to existing botanical components are minimised and that any rehabilitation is undertaken with conservation orientated approach.	To minimise the disturbance to existing flora To minimise the introduction and/or spread of weed species

**Management Actions**

- a. Ensure all soil surfaces are reshaped to avoid preferential flow paths and very steep gradients.
- b. All areas disturbed during the construction phase must have topsoil from the site mixed with indigenous grass seed (*Stenotaphrum secundatum* and *Cynodon dactylon*) replaced to a depth of 30 cm above subsoils.
- c. Where sloping areas occur, it will be necessary to stake a cover of soil saver matting over the grass seed / topsoil mix to prevent movement downslope until vegetation can establish.
- d. Alien vegetation must be removed 2 months and 6 months post replacement of the soil until the grass / indigenous vegetation is established.
- e. Ensure any litter from construction works or personnel is removed from the site. No litter, food scraps, or waste materials can be left at the site.
- f. Rehabilitation and landscaping may only make use of indigenous vegetation.
- g. Kikuyu grass may not be used to rehabilitate the road and fence line verges where the pipeline will be installed.

Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Method statement	As required	Contractor / Owner	Continuously	Audit	Visual / photographic

## 8 OPERATIONAL/MAINTENANCE PHASE ENVIRONMENTAL MANAGEMENT REQUIREMENTS

The Operational/Maintenance Phase of this EMMPr refers to the day to day management activities that are required to ensure sustainability and the achievement of the principles and objectives of the development. The requirements are applicable to the proponent, any HOA that is put in place, all employees and all visitors to the property.

<b>8.1 REPAIRS AND MAINTENANCE TO THE PIPELINE</b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To mitigate renewed wetland disturbance and potential sedimentation.			<ul style="list-style-type: none"> <li>To prevent renewed wetland disturbance.</li> </ul>		
<b>Management Actions</b>					
<ul style="list-style-type: none"> <li>a. Where the pipeline must be accessed for repairs or maintenance, the same footprint of disturbance applies as that described in the construction phase impact. I.e. 5 m either side of the pipeline.</li> <li>b. Any excessive sedimentation that has smothered plants in a wetland must be removed from the wetland by hand using spades, and contours must be reshaped to avoid concentrated flow paths.</li> <li>c. Renewed areas of disturbance must be grassed as per mitigation measures in the construction phase to ensure vegetation covers soil vulnerable to erosion or invasion with alien plants.</li> <li>d. Alien plants must be removed from the length of the pipeline in each watercourse while works are in progress.</li> </ul>					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual / Photographic	Ongoing	Developer / Contractor	As required	Audit	Audit
<ul style="list-style-type: none"> <li>Concentration of stormwater runoff will be minimised through the application of landscaping techniques, i.e. by creating grass lined swales, undulations and depressions, vegetation.</li> </ul>					

<b>8.2 ALIEN VEGETATION ESTABLISHMENT ALONG DISTURBED AREAS</b>					
<b>Management Statement</b>			<b>Impacts &amp; Risks Avoided</b>		
To ensure that indigenous vegetation is encouraged within urban areas.			<ul style="list-style-type: none"> <li>• Ongoing spread of alien invasive species.</li> <li>• Ensure protected species are taken into consideration.</li> </ul>		
<b>Management Actions</b>					
<p>a. The full length of the newly installed pipeline at each of the 4 watercourse crossing points must be inspected 6- and 12-months following completion of project by the site ECO. The purpose is to ensure disturbed areas are well vegetated with indigenous plants.</p> <p>b. If alien plants are present, it is necessary to appoint a contractor to remove them to ensure the pipeline footprint is clear of alien plants.</p>					
Method of monitoring implementation	Frequency of Monitoring	Responsible Party for implementing management action	Time period	Mechanism for monitoring Compliance	Programme for reporting on Compliance
Visual / photographic	Ongoing	Owner	As required	Audit	Audit

## 9 MONITORING

Monitoring is an important tool in determining the effectiveness of management actions by measuring changes in the environment. These could be in the form of fixed point photography where an area is photographed on a regular / seasonal basis to ascertain changes, monitoring of a particular aspect such as landscape integrity parameters, recordings of animal movement from fixed point etc. The most important aspect of any monitoring programme is **consistency and continuity**. This will ensure a level of scientific accuracy to determine baselines / thresholds and measure changes / deviations, which then drive management reactions.

Any required monitoring reports must be made available to the competent authority as required.

The type and frequency of monitoring must include:

- During construction photographs must be taken from pre identified fixed points and a comprehensive record maintained;
- Incident Reports;
- Site meeting minutes.

## 9.1 MONITORING TIMEFRAMES SUMMARY

Table 3: Monitoring Timeframe Summary

<b>MONITORING TIMEFRAMES</b>		
Type	Frequency	Criteria
ECO visits	As per section 5.4	Site photographs / site diary
Record keeping	Monthly	Site photographs, method statements, site meeting minutes (if applicable)
	3 month post construction	Completion Statement
Auditing	One year post construction	Compliance with the EA, EMPr, municipal permits and any other approvals

## 9.2 ENVIRONMENTAL AUDITS

A final construction phase Completion Statement must be submitted within 3 months of completion of construction / site handover.

This Completion Statement must include the monitoring results as above, where applicable to construction.

An Environmental Audit should be undertaken one (1) year post construction.

## 9.3 AUDIT REPORTS FREQUENCIES AND FORMAT

The table below provides a summary of the timeframes for the various Audit Reports specified in the EA.

Table 4: Audit Reports Timeframe Summary

<b>ENVIRONMENTAL AUDIT TIMEFRAMES</b>		
Type	Frequency	Criteria
Final Construction Audit	Two years post construction	Audit on operational aspects of the EA and EMPr

In terms of the 2014 EIA Regulations, Audit Reports must be submitted to the registered Interested & Affected Parties within 7 days of submission to the competent authority.

In order to comply with the 2014 EIA Regulations, any audits must be undertaken using the following format:

Table 5: Environmental Audit Requirements

<p>Appendix 7 of Regulation 326 of the 2014 EIA Regulations, as amended contains the required contents of an Environmental Audit Report. The checklist below serves as a summary of how these objectives &amp; requirements were incorporated into this Audit Report.</p>	
Objective	Description
The objective of the environmental audit report is to -	
(a) Report on – (i) the level of compliance with the conditions of the environmental authorisation and the EMPr, and where applicable, the closure plan; and (ii) the extent to which the avoidance, management and mitigation measures provided for in the EMPr, and where applicable, the 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, and where applicable, the closure plan.	
(d) Identify shortcomings in the EMPr, and where applicable, the closure plan.	
(e) Identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMPr, and where applicable, the closure plan.	
Requirement	Description
(1) An Environmental audit report prepared in terms of these Regulations must contain -	
(a) Details of – (i) The independent person who prepared the environmental audit report; and (ii) The expertise of independent person that compiled the environmental audit report.	
(b) A declaration that the independent auditor is independent in a form as may be specified by the competent authority.	
(c) An indication of the scope of, and the purpose for which, the environmental audit report was prepared.	
(d) A description of the methodology adopted in preparing the environmental audit report.	
(e) An indication of the ability of the EMPr, and where applicable the closure plan to – (i) Sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with	

Appendix 7 of Regulation 326 of the 2014 EIA Regulations, as amended contains the required contents of an Environmental Audit Report. The checklist below serves as a summary of how these objectives & requirements were incorporated into this Audit Report.

Objective	Description
the undertaking of the activity on an on-going basis; (ii) Sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and (iii) Ensure compliance with the provisions of environmental authorisation, EMP, and where applicable, the closure plan.	
(f) A description of any assumptions made, and any uncertainties or gaps in knowledge.	
(g) A description of an consultation process that was undertaken during the course of carrying out the environmental audit report.	
(h) A summary and copies of any comments that were received during any consultation process.	
(i) Any other information requested by the competent authority.	

Any other requirements of the EA or any other authorisations must be incorporated into an Audit where necessary.

**10 DECOMMISSIONING PHASE ENVIRONMENTAL MANAGEMENT REQUIREMENTS**

Not Applicable.

**11 NON-COMPLIANCE**

Any person is liable on conviction of an offence in terms of regulation 49(a) of the National Environmental Laws Second Amendment Act (Act 30 of 2013) to imprisonment for a period not exceeding ten (10) years or to a fine not exceeding R10 million or an amount prescribed in terms of the Adjustment of Fines Act, 1991 (Act No. 101 of 1991).

It is the responsibility of the ECO to report matters of non-compliance to the Employer’s Representative or the Holder of the EA if no representative is in place. It is the responsibility of the Holder of the EA, and not the ECO, to report such matters of non-compliance to the competent Authority.

## 11.1 PROCEDURES

The Holder of the EA shall comply with the environmental specifications and requirements of this EMPr, any Approval / License issued and Section 28 of NEMA, on an on-going basis and any failure on his part to do so will entitle the authorities to **impose a penalty**<sup>1</sup>.

In the event of non-compliance the following recommended process shall be followed:

- The competent authority shall issue a **Notice of Non-compliance** to the Holder of the EA, stating the nature and magnitude of the contravention.
- The Holder of the EA shall **act to correct the transgression** within the period specified in by the authority.
- The Holder of the EA shall provide the competent authority with a **written statement** describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions.
- In the case of the Holder of the EA failing to remedy the situation within the predetermined time frame, the competent authority may recommend halting the activity.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the competent authority shall be entitled to undertake or to cause to be undertaken such **remedial works** as may be required to make good such damage at the cost of the Project applicant.
- In the event of a dispute, difference of opinion, etc. between any parties in regard to or arising out of interpretation of the conditions of the EMPr, disagreement regarding the implementation or method of implementation of conditions of the EMPr, etc. any party shall be entitled to require that the issue be referred to **specialists and / or the competent authority** for determination.
- The competent authority shall at all times have the right to **stop work** and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

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<sup>1</sup> A penalty may not necessarily be a monetary fine but could also be a stoppage in work time, additional mechanisms to prevent pollution or degradation at the cost of the proponent or even a directive to cease activities from the competent authority.



## 12 REFERENCES

**Aquanotion, 2008.** [www.twoflush.com/conservbody.htm](http://www.twoflush.com/conservbody.htm). Aquanotion Ltd, Alberta, Canada.

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**eHow Home, 2011.** [www.eHow.com](http://www.eHow.com) - *How to Safely Dispose of Energy Efficient Light Bulbs*.

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





Legend

Map Center: Lon: 22°26'28"E  
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Date created: 2024/06/05



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community  
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community





Legend

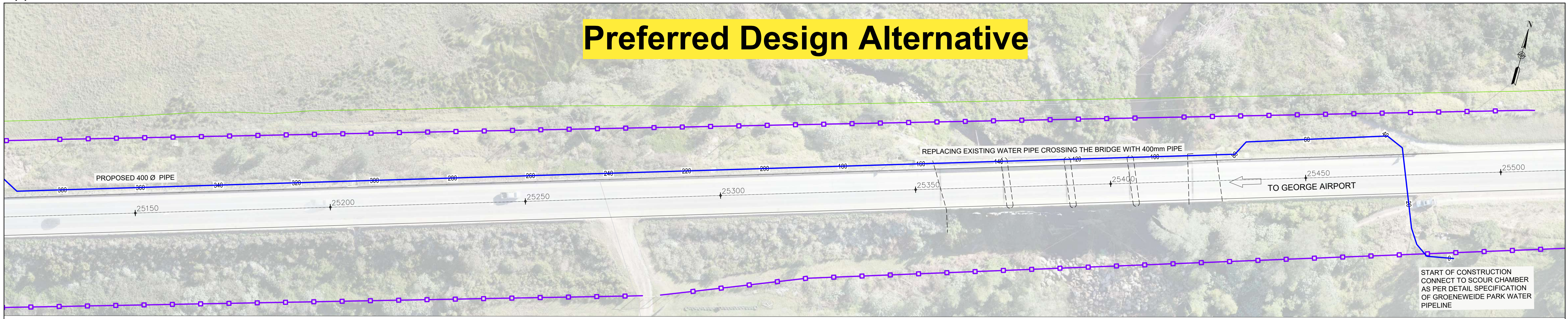
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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community  
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



# Preferred Design Alternative



START OF CONSTRUCTION  
CONNECT TO SCOUR CHAMBER  
AS PER DETAIL SPECIFICATION  
OF GROENEWEIDE PARK WATER  
PIPELINE



LEGEND	
	EDGE OF ROAD
	FENCE
	CADASTRALS
	5 m BUILDING LINE FROM FENCE
	PROPOSED NEW BULK WATER PIPELINE ROUTE

**NOTE:**  
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

CONCEPT DESIGN

NO.	DATE	DESCRIPTION	INITIAL
C00	16-05-2024	ISSUED FOR CONCEPT DESIGN PURPOSES	TC

DESIGNED	A TOOTLA
CHECKED	T CRONJE
DRAWN	A TOOTLA
CHECKED	T CRONJE

SIGNED \_\_\_\_\_  
SMC South Africa

DATE \_\_\_\_\_

Member of the Surbana Jurong Group

THE CITY FOR ALL REASONS

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website: www.smc.com      Fax (044) 873-5086      website: www.george.org.za      Fax (044) 529-9872

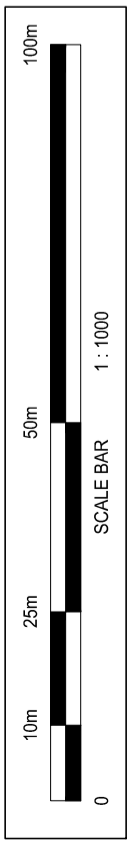
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George Municipality

DATE \_\_\_\_\_

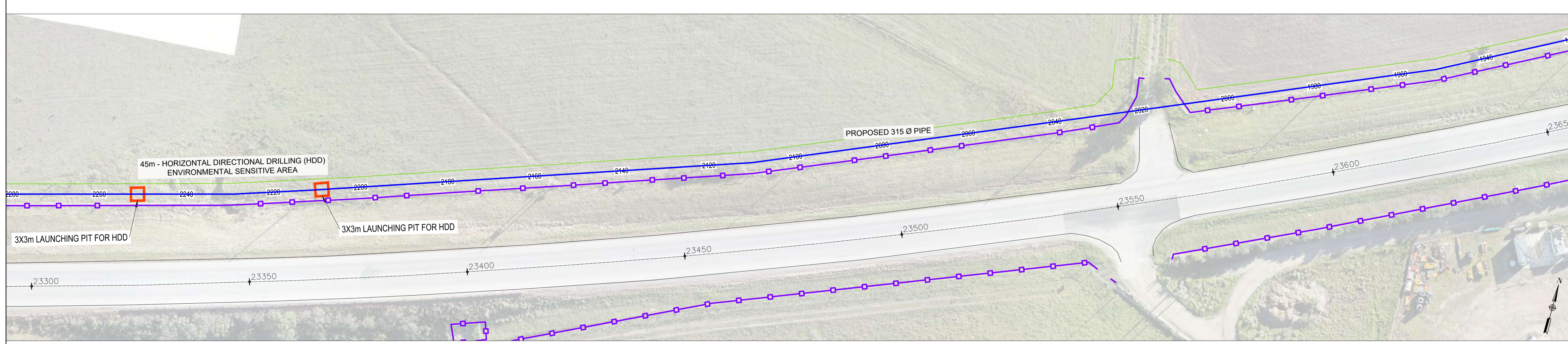
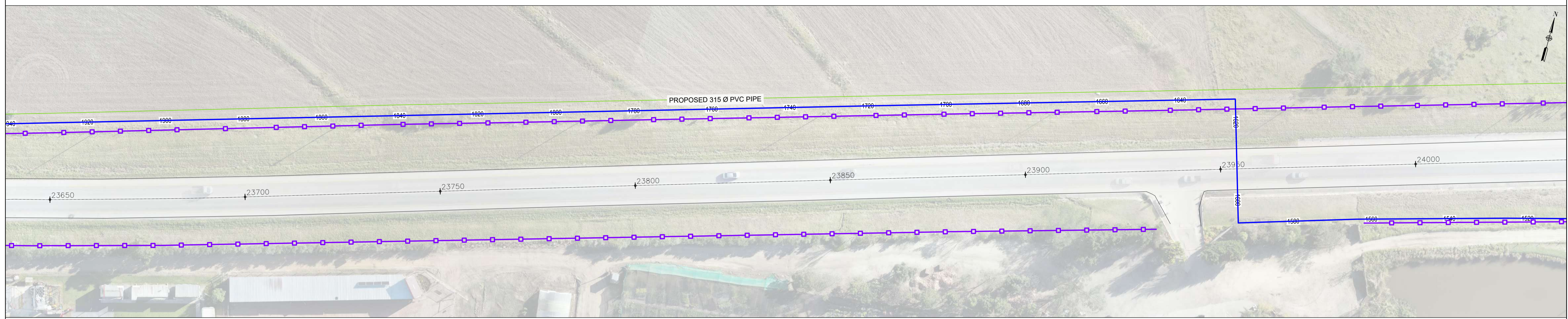
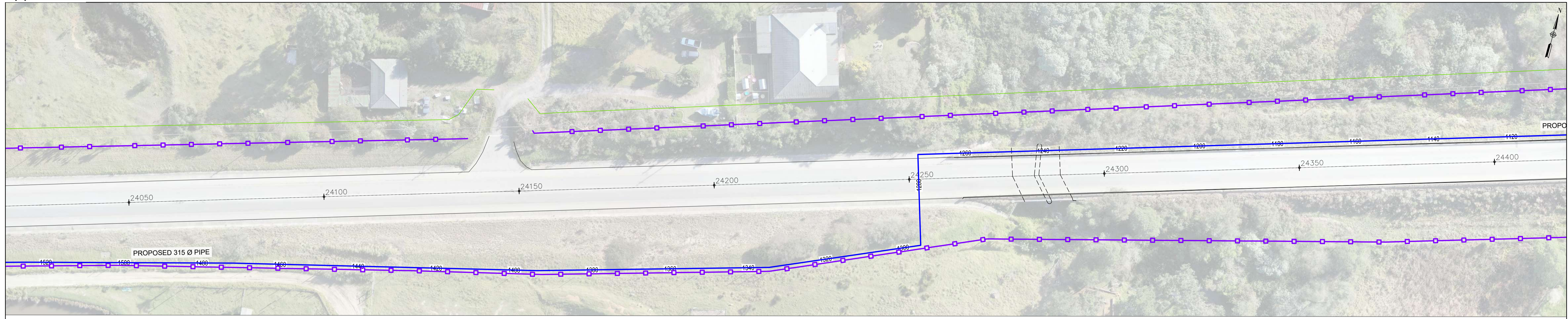
**UPGRADE OF AIRPORT BULK WATER PIPELINE**

**PREFERRED PIPELINE ROUTE LAYOUT SHEET 01 OF 04**

SIZE	A1	SCALE	1:500
PROJECT DRAWING NUMBER		C1915 - 613 - 001	
REV	C00	SHEET No.	01 OF 04







**LEGEND**

- EDGE OF ROAD
- FENCE
- CADASTRALS
- 5 m BUILDING LINE FROM FENCE
- PROPOSED NEW BULK WATER PIPELINE ROUTE

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C00	16-05-2024	ISSUED FOR CONCEPT DESIGN PURPOSES	TC

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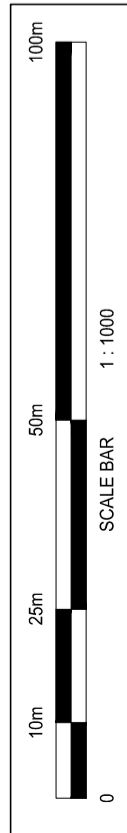
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DATE	

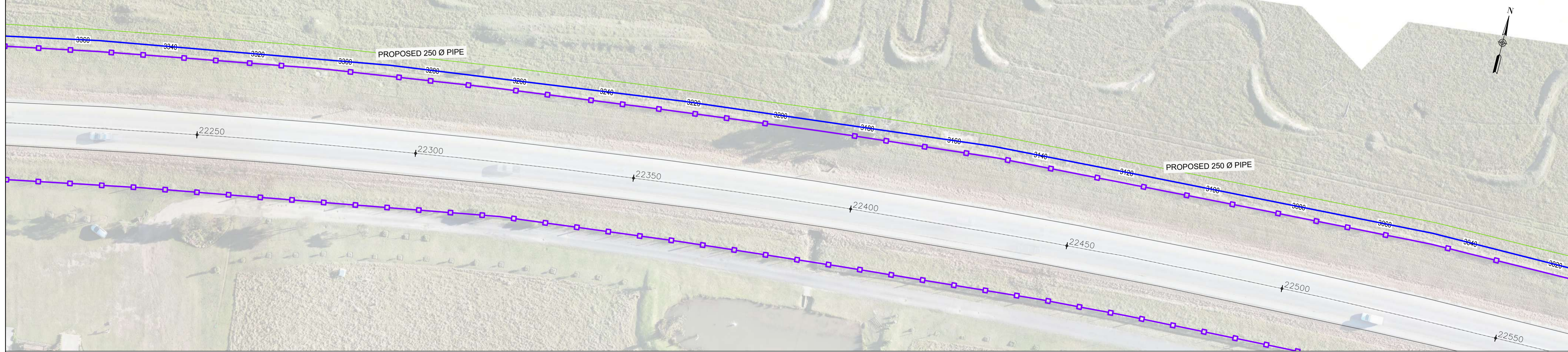
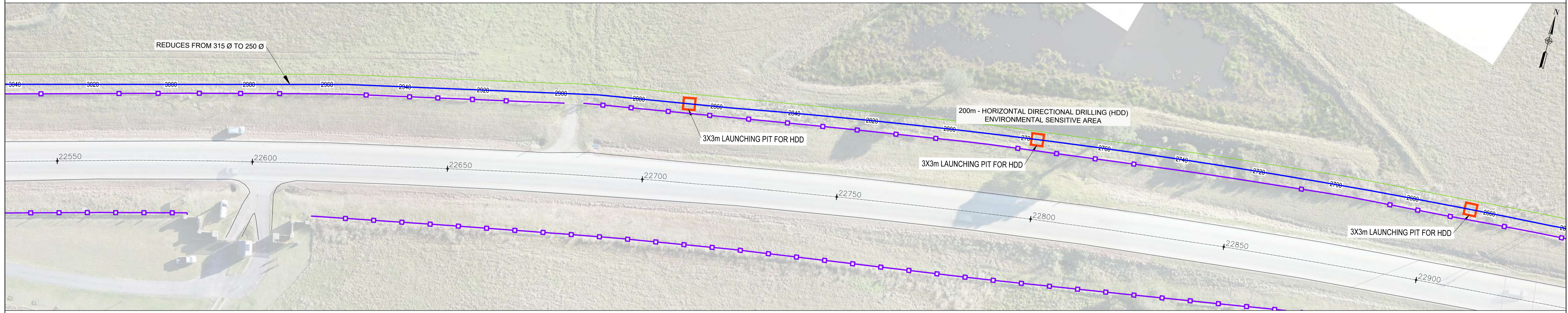
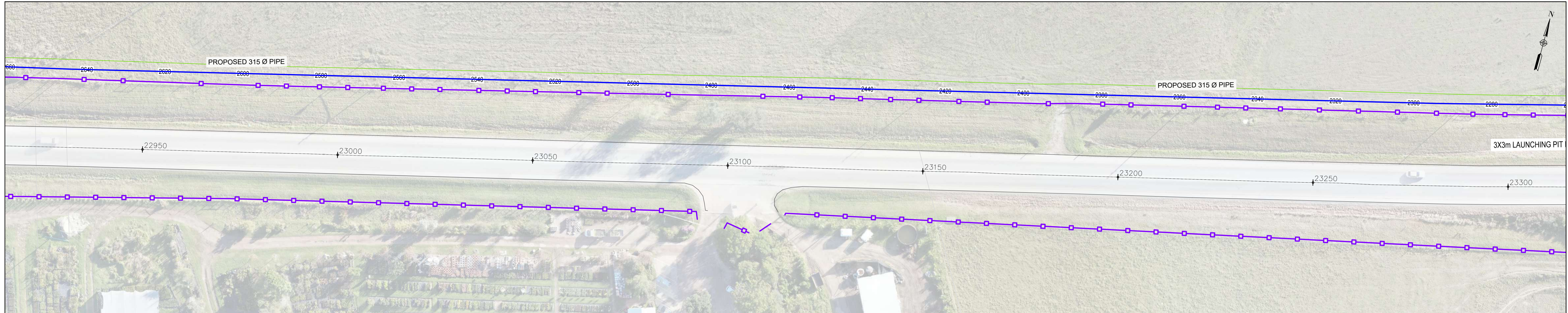
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**PREFERRED PIPELINE ROUTE LAYOUT SHEET 02 OF 04**

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PROJECT DRAWING NUMBER	C1915 - 613 - 002		
REV	C00	SHEET No.	02 OF 04







**LEGEND**

- EDGE OF ROAD
- FENCE
- CADASTRALS
- 5 m BUILDING LINE FROM FENCE
- PROPOSED NEW BULK WATER PIPELINE ROUTE

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DATE \_\_\_\_\_

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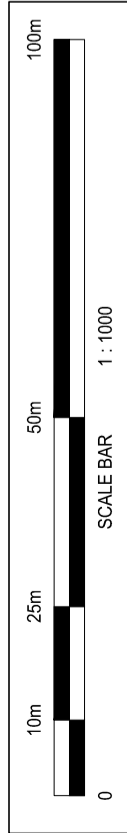
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DATE \_\_\_\_\_

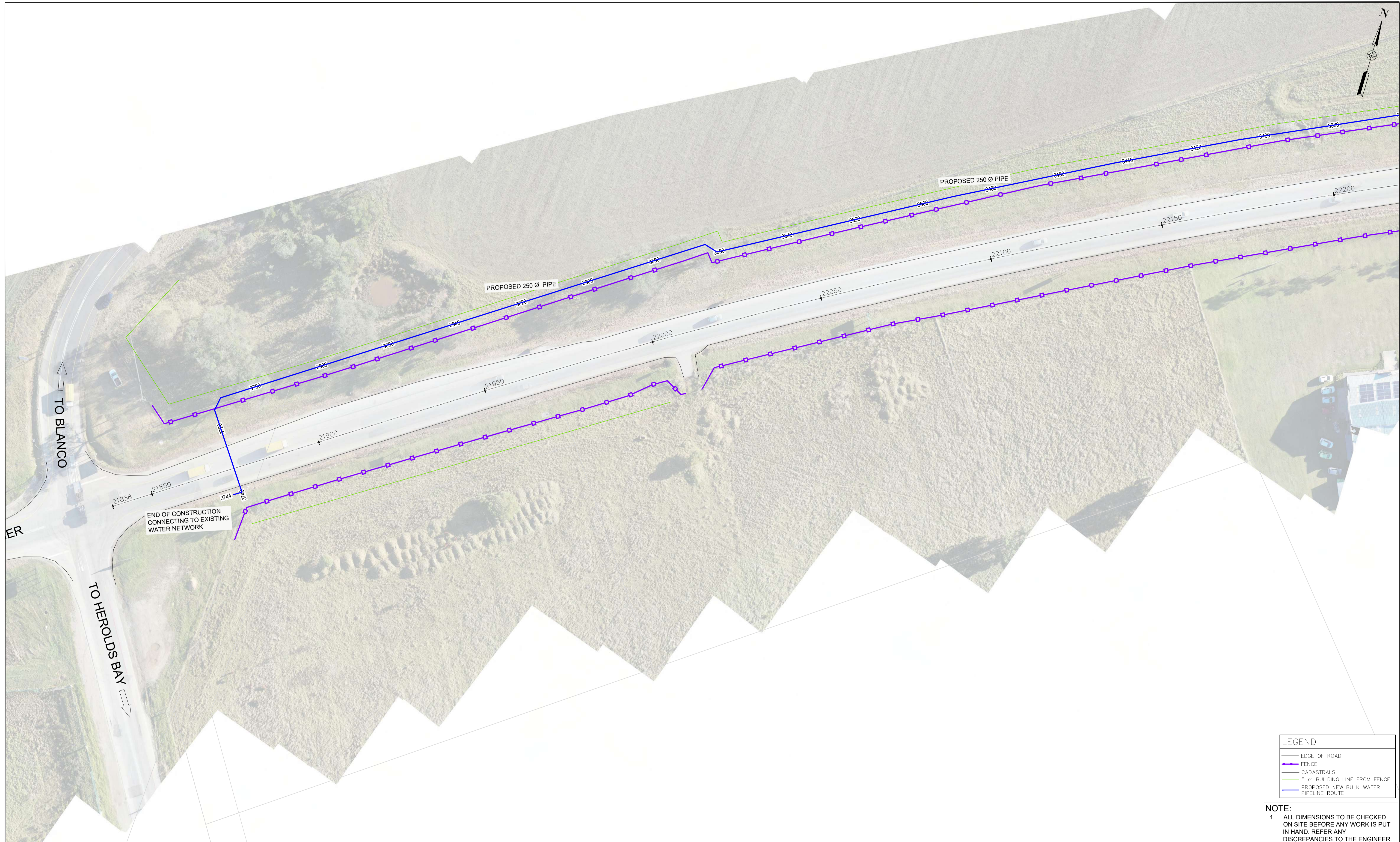
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**PREFERRED PIPELINE ROUTE LAYOUT SHEET 03 OF 04**

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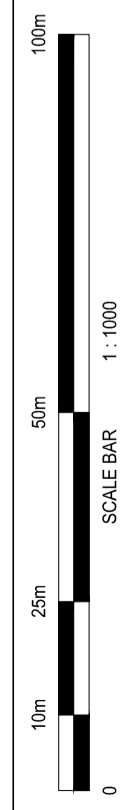




LEGEND	
	EDGE OF ROAD
	FENCE
	CADASTRALS
	5 m BUILDING LINE FROM FENCE
	PROPOSED NEW BULK WATER PIPELINE ROUTE

**NOTE:**  
 1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

CONCEPT DESIGN



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C00	16-05-2024	ISSUED FOR CONCEPT DESIGN PURPOSES	TC

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CHECKED	T CRONJE

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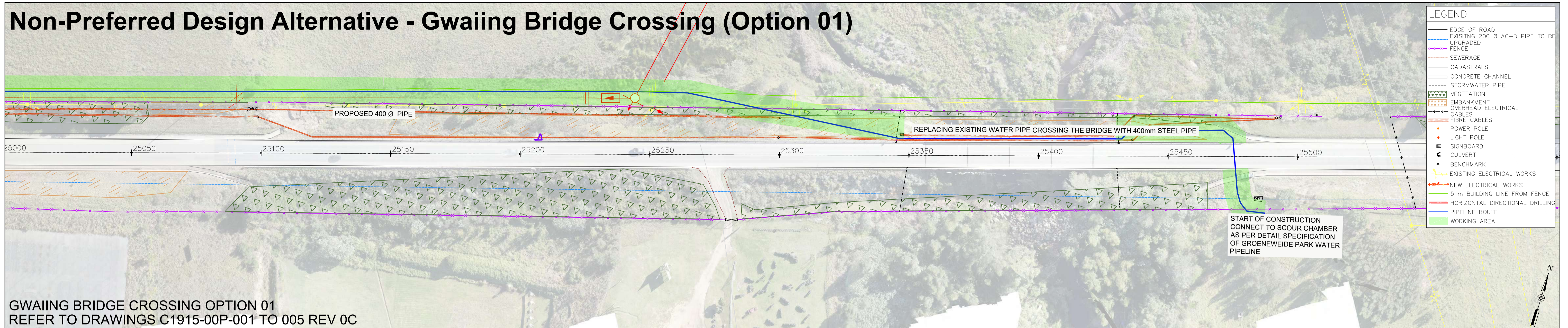
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**PREFERRED PIPELINE ROUTE LAYOUT SHEET 04 OF 04**

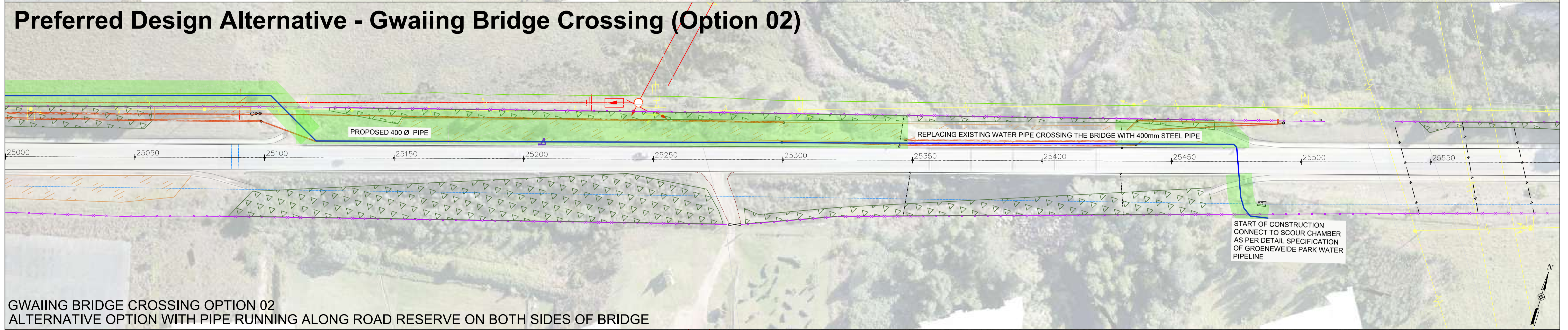
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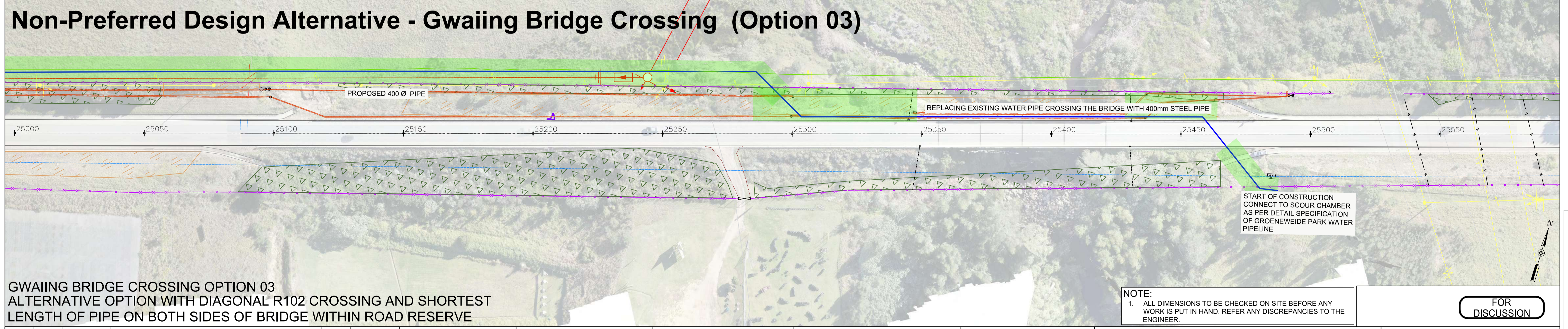
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**Preferred Design Alternative - Gwaiing Bridge Crossing (Option 02)**



**Non-Preferred Design Alternative - Gwaiing Bridge Crossing (Option 03)**



NOTE:  
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

FOR DISCUSSION

REVISIONS	NO.	DATE	DESCRIPTION	INITIAL
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	C00	09-04-2024	FOR DISCUSSION PURPOSES	TC

DESIGNED	A TOOTLA
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website: www.george.org.za

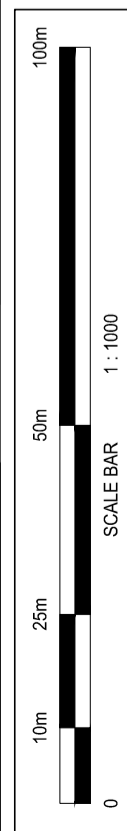
c/o York & Market Street  
George 6529  
Tel (044) 801 9496  
Fax (086) 529 9872

SIGNED \_\_\_\_\_  
George Municipality  
DATE \_\_\_\_\_

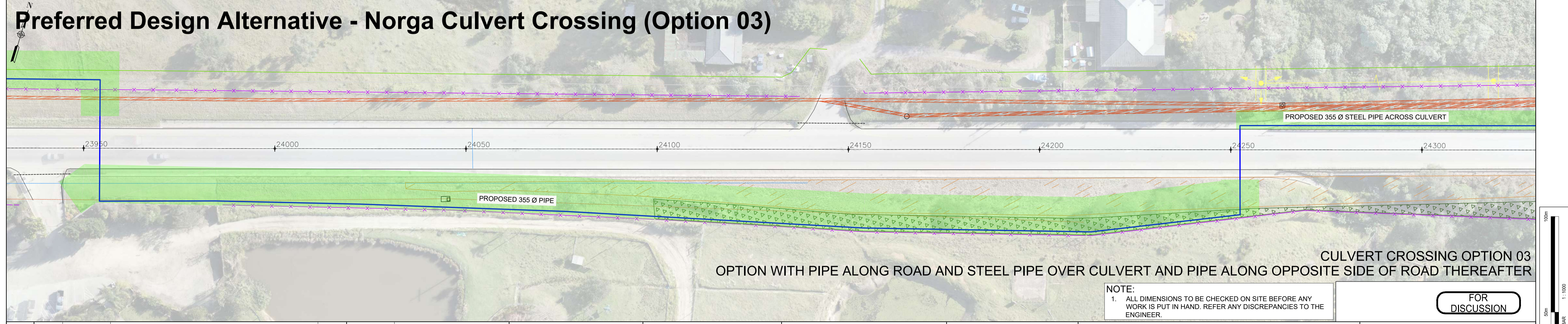
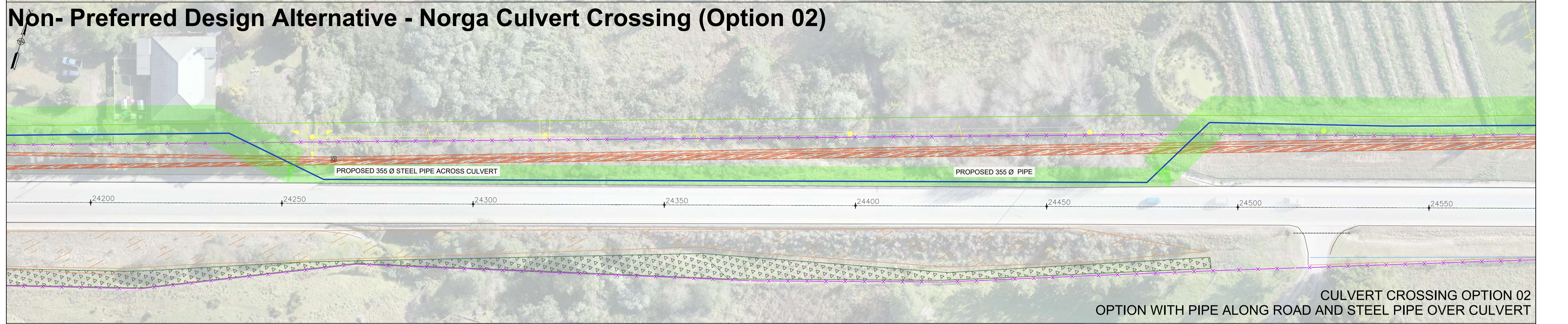
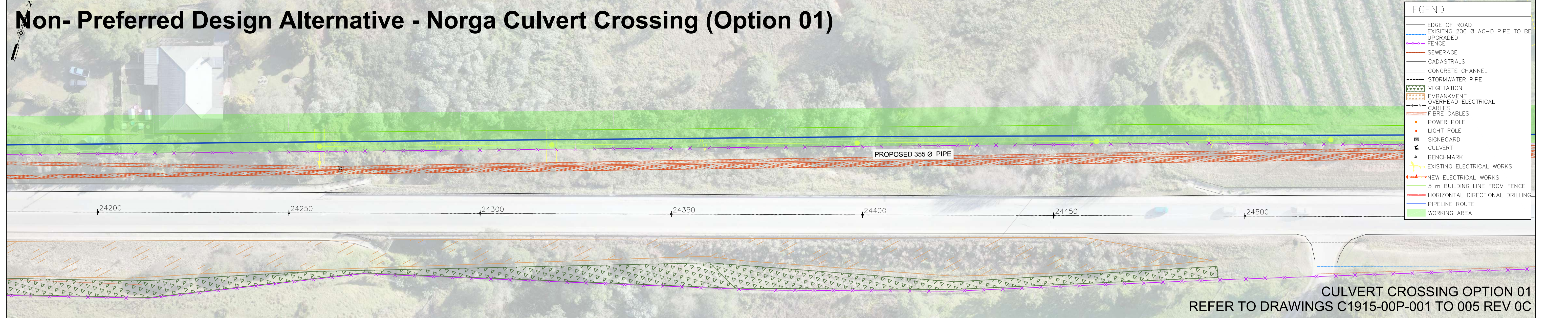
**UPGRADE OF AIRPORT BULK PIPELINE**

**PROPOSED PIPELINE ROUTE OPTIONS AND ASSOCIATED WORKING AREA GWAIING RIVER BRIDGE CROSSING**

SIZE	A1	SCALE	1:750
PROJECT DRAWING NUMBER C1951 - 611 - 001			
REV	C01	SHEET No.	01 OF 03







**NOTE:**  
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

**FOR DISCUSSION**

REVISIONS	NO.	DATE	DESCRIPTION	INITIAL
	C01	10-04-2024	FOR DISCUSSION PURPOSES	TC
	C00	09-04-2024	FOR DISCUSSION PURPOSES	TC

DESIGNED	A TOOTLA
CHECKED	T CRONJE
DRAWN	A TOOTLA
CHECKED	T CRONJE

SIGNED \_\_\_\_\_  
SMC South Africa

DATE \_\_\_\_\_

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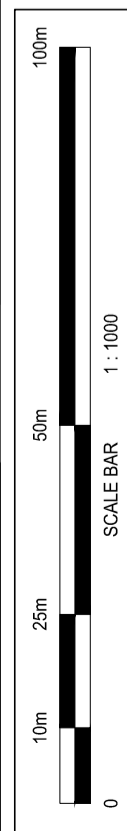
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George Municipality

DATE \_\_\_\_\_

**UPGRADE OF AIRPORT BULK PIPELINE**

**PROPOSED PIPELINE ROUTE OPTIONS AND ASSOCIATED WORKING AREA CULVERT CROSSING**

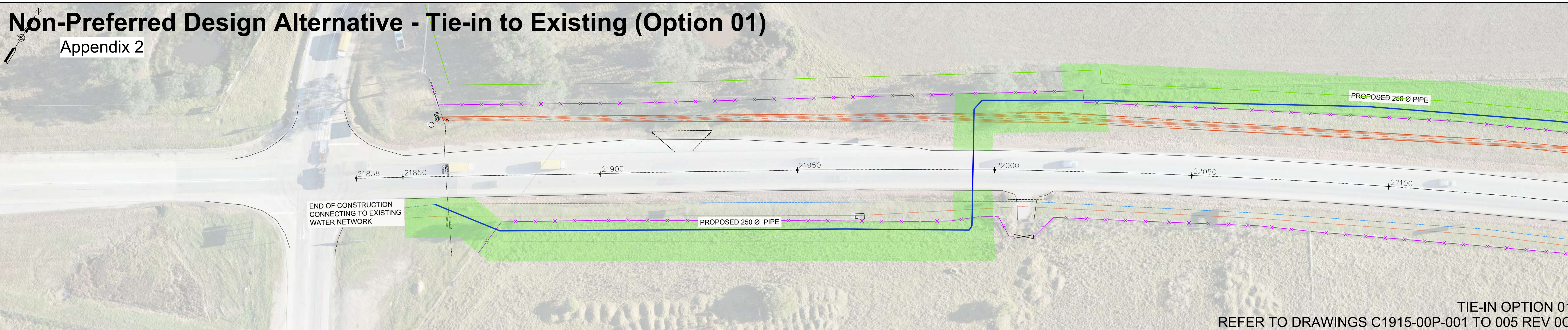
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REV	C01	SHEET No.	03 OF 03



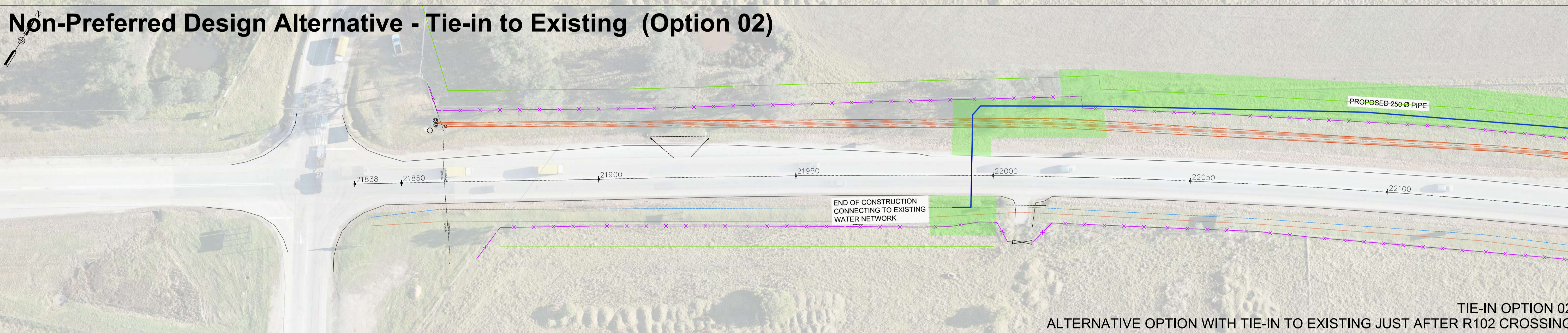


### Non-Preferred Design Alternative - Tie-in to Existing (Option 01)

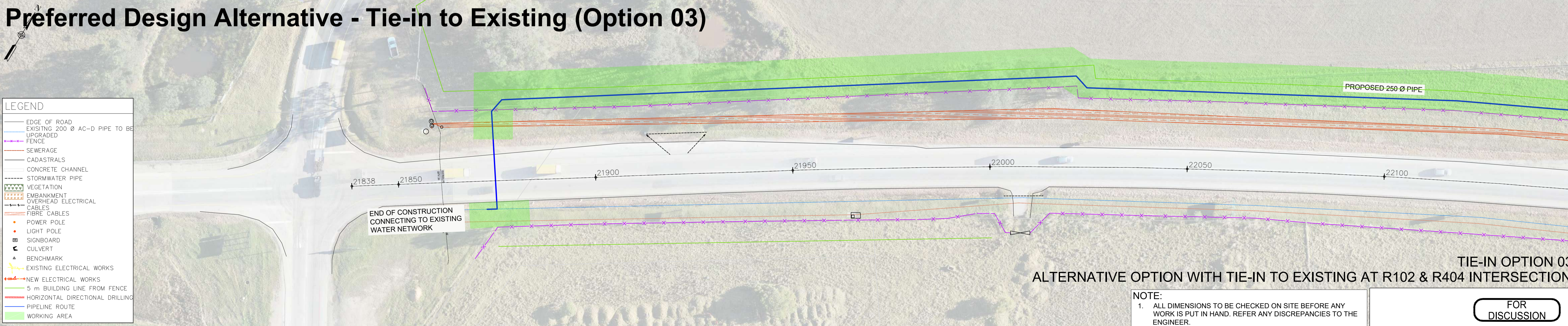
Appendix 2



### Non-Preferred Design Alternative - Tie-in to Existing (Option 02)



### Preferred Design Alternative - Tie-in to Existing (Option 03)



**LEGEND**

- EDGE OF ROAD
- EXISTING 200 Ø AC-D PIPE TO BE UPGRADED
- FENCE
- SEWERAGE
- CADASTRALS
- CONCRETE CHANNEL
- STORMWATER PIPE
- VEGETATION
- EMBANKMENT
- OVERHEAD ELECTRICAL CABLES
- FIBRE CABLES
- POWER POLE
- LIGHT POLE
- SIGNBOARD
- CULVERT
- BENCHMARK
- EXISTING ELECTRICAL WORKS
- NEW ELECTRICAL WORKS
- 5 m BUILDING LINE FROM FENCE
- HORIZONTAL DIRECTIONAL DRILLING
- PIPELINE ROUTE
- WORKING AREA

**NOTE:**  
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

**FOR DISCUSSION**

REVISIONS	NO.	DATE	DESCRIPTION	INITIAL
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	C00	09-04-2024	FOR DISCUSSION PURPOSES	TC

DESIGNED	A TOOTLA
CHECKED	T CRONJE
DRAWN	A TOOTLA
CHECKED	T CRONJE
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DATE	



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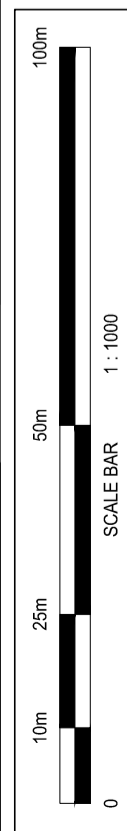
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SIGNED	George Municipality
DATE	

**UPGRADE OF AIRPORT BULK PIPELINE**

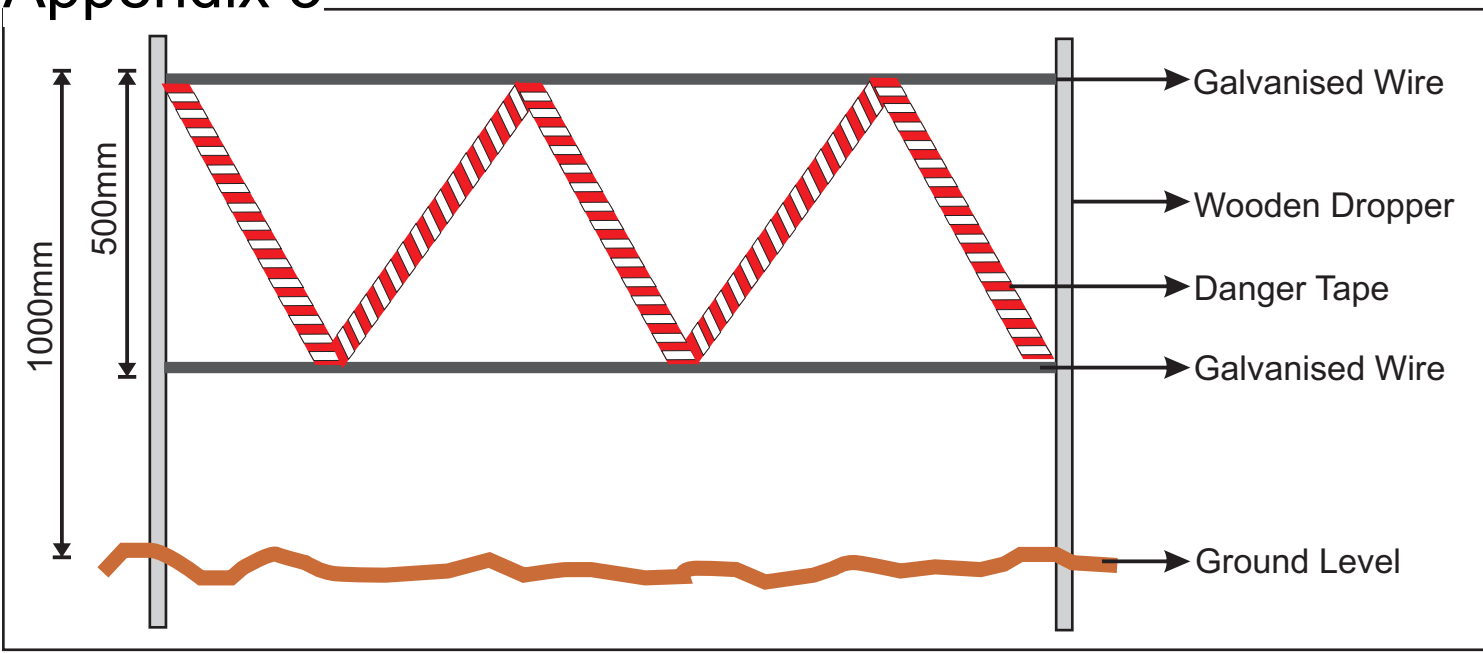
**PROPOSED PIPELINE ROUTE OPTIONS AND ASSOCIATED WORKING AREA TIE-IN WITH EXISTING**

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PROJECT DRAWING NUMBER			
C1951 - 611 - 002			
REV	C01	SHEET No.	02 OF 03





# Appendix 3

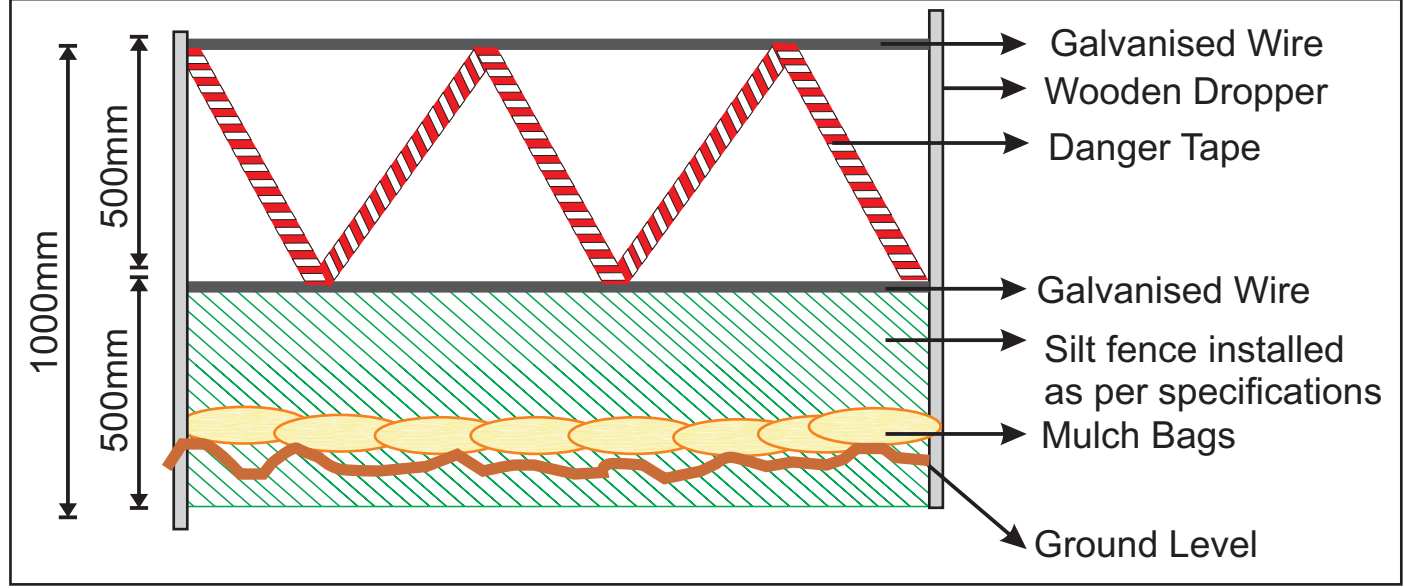


**Plate A:** Showing a cross section of a typical method of demarcation of no-go areas.

Where demarcation is required on a down slope, it can be more cost effective to include the required silt protection mechanisms on the same support structure as the demarcation. This is detailed in **Plate B** below and must be read in conjunction with the details on erosion control included in the previous diagram.

## GENERAL CONSIDERATIONS FOR DEMARCATION OF NO GOAREAS

- The demarcation must include all areas that are going to be disturbed in the total construction (including all service lines)
- The no -go areas may not be accessed by any person (including lunch, tea breaks etc.). Without the explicit written permission from te ECO.
- Maximum fines will be issued for any non compliance with regards to the no go policy.

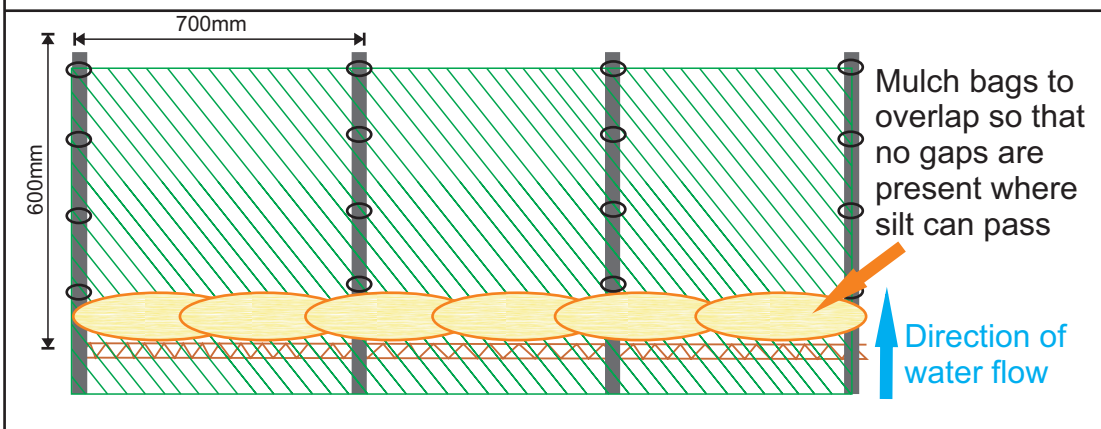


**Figure 1:** Demarcation of No - Go Areas During Construction



*Cape Environmental Assessment Practitioners (Pty) Ltd*

### Frontal View



The purpose of a silt fence is to create a temporary barrier to maintain sediment on a construction site in order to prevent soil erosion and pollution through sediment and nutrient loading. Silt fences are designed to detain sediment from the disturbed construction area and also prevent sheet erosion by decreasing the velocity of the run off.

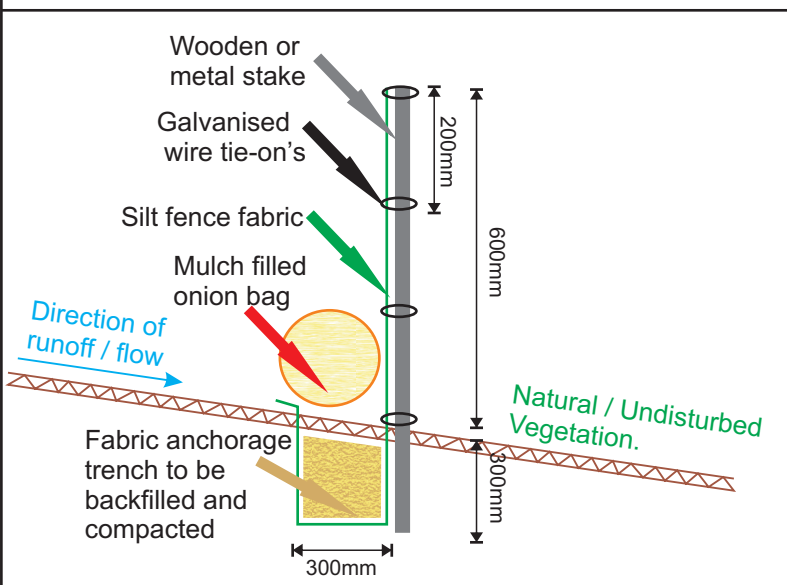
### Technical Specifications

- Silt fence fabric to consist out of 50% shade cloth or a geotextile such as biddim (if biddim is used, it is not necessary to place mulch bags).
- Wooden droppers are suitable for the stakes. If the construction program takes place over an extended time frame it may be necessary to use treated droppers or metal stakes.
- The support stakes should not be placed further than 700mm apart on the down slope side of the fabric.
- The fabric should be secured to the stakes using galvanised wire ties not further than 200mm apart.
- The fabric anchorage trench should be at least 300mm deep.

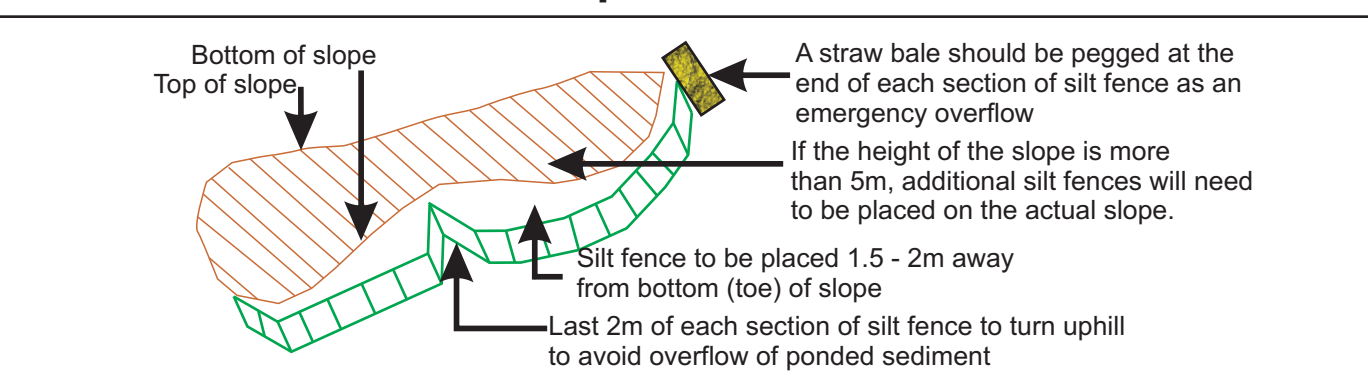
### Planning, Placing and Maintenance

- The silt fence is to be installed on all disturbed slopes where sheet erosion may take place.
- This type of silt fence is not suitable for areas where water is concentrated. i.e. gulleys and storm-water outlets.
- The silt fences should be along the contour lines
- The rows of silt fences should be bowed to prevent erosion and loss of silt on the ends of the fence line.
- Silt fences should be inspected weekly and before every forecast rainfall event. Any damage must be repaired immediately.
- Silt deposits should be cleared after each rainfall event. **CLEARED SILT MUST NOT BE PLACED DOWN SLOPE OF THE FENCE.**

### Cross-section View

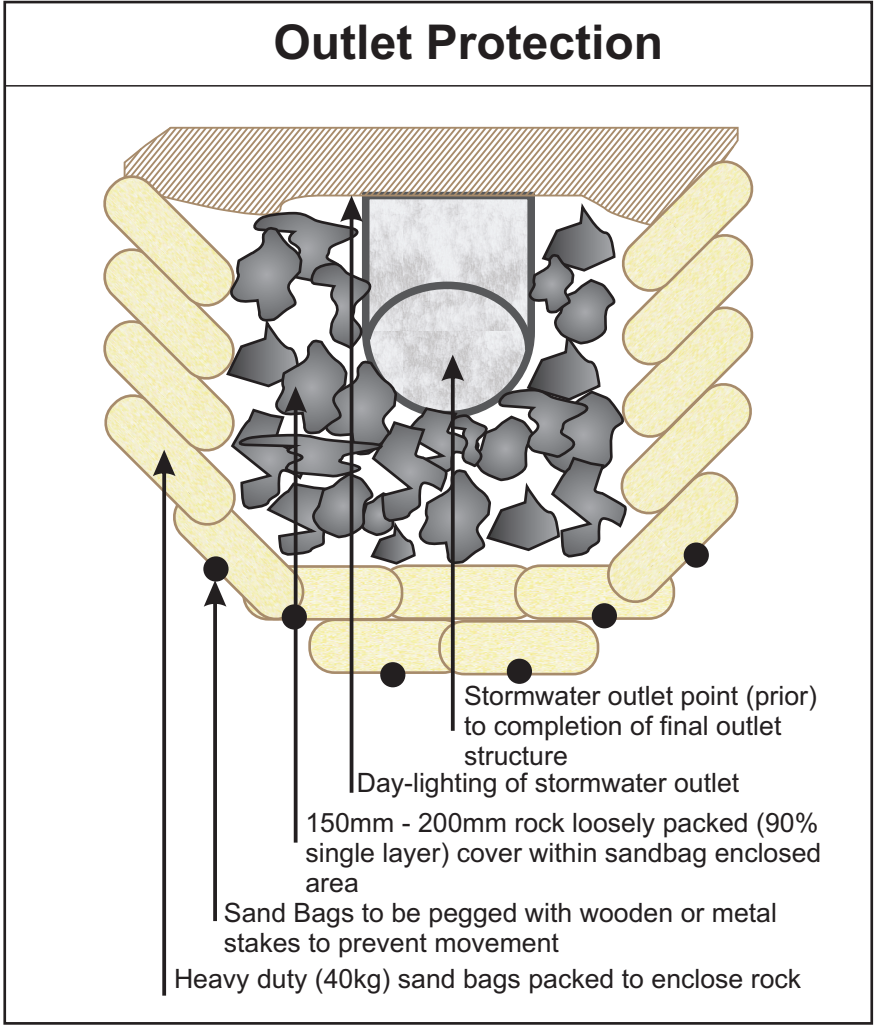
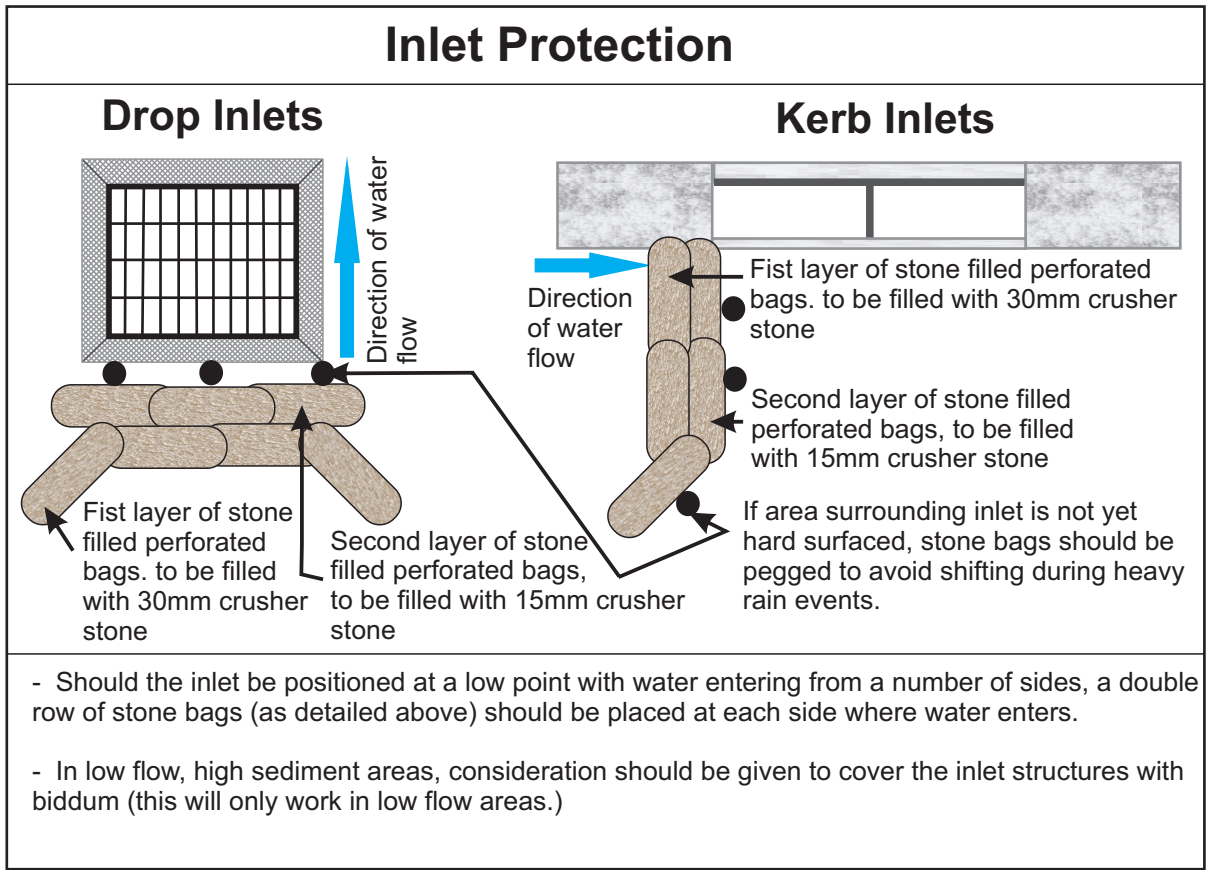


### Top View



**Figure 2: Specifications for Silt Fences**





- The methodology referred to above is effective as a temporary measure to be used during construction and is in no way intended to replace the permanent measures that must be installed. These permanent measures must be constructed as per the engineers specifications.
- Stormwater systems should ideally be constructed during low rainfall periods in order to allow for permanent protection measures to be put in place before the rainy season.
- Consideration should be given to encase the outlet structure with a geo-fabric such as biddum. This should first be clarified with the site engineer to ensure compatibility with the stormwater system.

**Figure 3:** Specifications for Temporary Stormwater Management During Construction

## Key Environmental Considerations for Haul Roads

The most important environmental factor to be considered regarding access and haul roads, is the location thereof. Haul roads should be designed to make use of future permanent internal roads and access points.

The haul roads should never be construction in areas that will not be permanently transformed with the development. Nor should they be constructed in any sensitive area.

Another safety and environmental hazard caused by haul road surface is dust problems. Roads should be designed with enough fines to act as binders for the larger particles. However, an excess of fines will result in these particles being released to the atmosphere when repeated stress is applied by the equipment tires. All haul roads that do not have a "sealed" surface, will create dust. The dust problem is mainly dealt with by application of water.

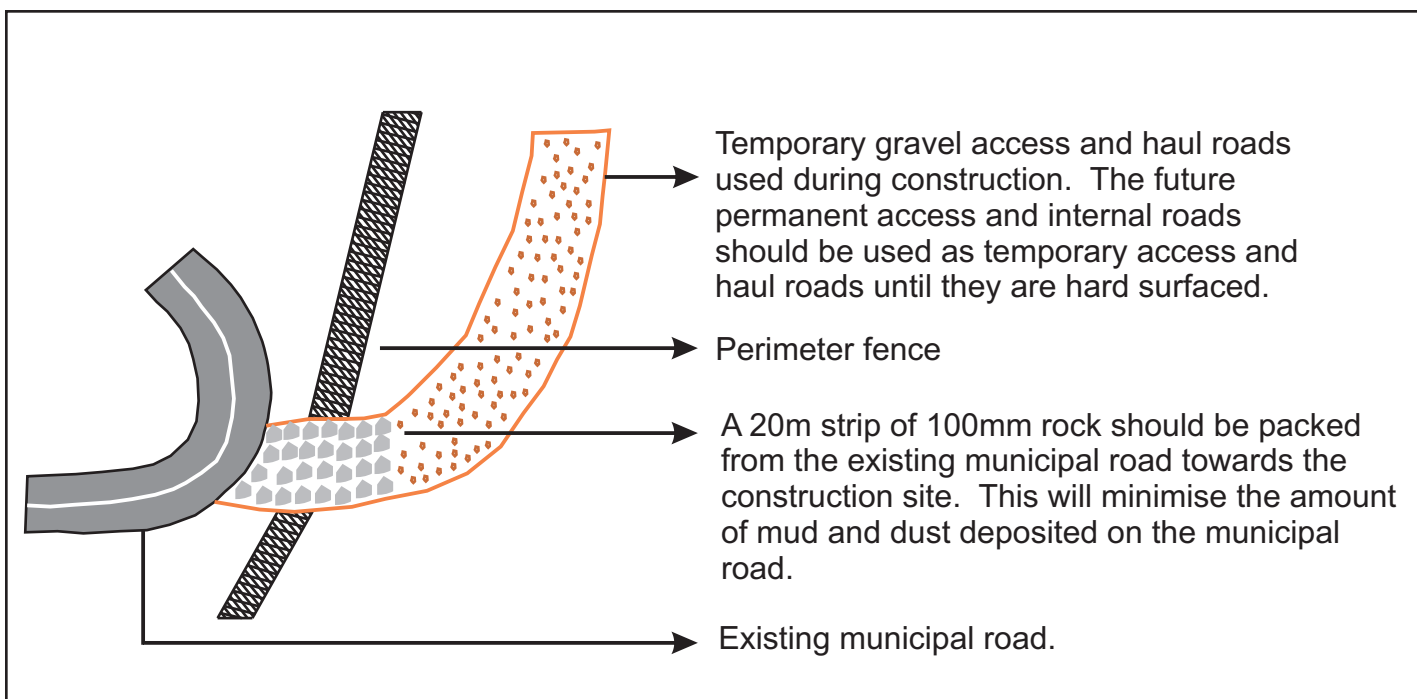
### Minimisation of Dust on Haul Roads

- Every effort to minimize dust pollution on the site must be undertaken.

- Construction vehicles must adhere to speed limits and minimization of haul roads must be implemented. During dry, dusty periods haul roads should be kept dampened to prevent excess dust.

- No potable water may be used for damping haul roads.

- As an alternative, products such as road environment dust suppressants (Reds) would be recommended in order to minimize the use of water for controlling dust pollution. This is to be determined by the ECO during construction as required.



**Figure 4:** Management of Haul and Access Control During Construction



Cape Environmental Assessment  
Practitioners (Pty) Ltd





# Cape EAPrac Company Profile

Cape Environmental Assessment Practitioners (Pty) Ltd was established in March 2008 by Directors **Doug Jeffery** (EAPASA Reg. No 2019/1746) and **Louise-Mari van Zyl** (EAPASA Reg. No. 2019/1444). The full time professional team includes: **Dale Holder** (Senior Environmental Practitioner (EAPASA Reg.No 2019/301)/GIS/ECO), **Siân Holder** (Practitioner/ECO/Environmental Education), **Paul Buchholz** (Environmental Consultant/Professional GIS Practitioner), **Mariska Nicholson** (Intern Environmental Consultant), **Onke Nandipha** (Junior Consultant/ECO), **Charmaine Mudau** (Environmental Consultant/ECO) and **Carin Naudé** (Business Administrator).

The firm implements legislation under the National Environmental Management Act (NEMA), National Environmental Management: Waste Act (NEM:WA) and the National Environmental Management: Air Quality Act (NEM:AQA).

Our main services include:

- Environmental Impact Assessments (EIA's & Basic Assessments)
- Environmental Management Policies & Plans (EMMP's)
- Environmental Control & Monitoring (ECO)
- Environmental Audits
- Environmental Education & Interpretation
- Environmental Constraints Analysis
- Public Participation & Stakeholder Engagement
- Outeniqua Sensitive Coastal Area Permits (OSCA)
- Forestry Applications (for removal/pruning of protected species)
- GIS & Mapping
- Retrospective Damage Assessment (Section 24G)
- Rehabilitation Plans
- Coastal Water Discharge Permits
- Air Quality Licence Applications (AEL's)
- Waste Management Licence Applications (Waste Licence)

## PROJECT EXPERIENCE INCLUDES

Reverse Osmosis Desalination; Sensitive Environmental Management including National Parks/Conservation Areas & World Heritage Sites; Renewable Energy Projects (Solar & Wind); Waste Management License Applications for Waste Disposal Sites, Sewerage Plants & Abattoirs; Waste-to-Energy Projects including Biogas Facilities; Marine Aquaculture; Filling Stations; Air Emission Processes for Sawmills, Brick Works & Processing Plants; ECO responsibilities on Private & State Housing Developments, Provincial & Municipal Roads and Infrastructure, Private, Provincial & Municipal applications for development of infrastructure, housing & commercial components

LIST OF ONGOING **CAPE EAPRAC**  
PROJECTS IS AVAILABLE  
ON REQUEST.  
PLEASE VISIT OUR  
WEBSITE FOR MORE DETAILS

# The Team

## Doug Jeffery - Director

Doug Jeffery obtained a Bsc with majors in Botany and Zoology at the University of Cape Town (UCT) and went on to obtain his MSc in Botany also at UCT. He has worked extensively in the Western-, Southern- and Eastern Cape both as a professional Botanist and co-ordinating EIA processes for over 20 years. He has been registered with the South African Council for Natural Scientific Professions as a Natural Scientist since 1990. He is also registered with the Environmental Assessment Practitioners Association of South Africa.

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## Dale Holder

Senior Practitioner / GIS / ECO

Dale graduated from the Technicon Pretoria in 1999 with a National Diploma in Nature Conservation. He worked as a Socio-Ecologist for SANParks and as Project Manager for the Department of Marine and Coastal Management. He started working as an environmental practitioner in 2002. His focus is currently on Renewable Energy Infrastructure Assessment, but is also involved with other Assessment, Public Participation & Stakeholder Engagement, GIS & Mapping, Biophysical Inventories, Retrospective Damage Assessment, Air Quality License Applications, Waste Management License Applications, Environmental Impact Assessments, Environmental Management Policies and Plans, Environmental Control, Monitoring and Auditing, Environmental Awareness and Training Programs, Environmental Education and Interpretation and Environmental Feasibility Assessments. He is registered as an EAP with the Environmental Assessment Practitioners Association of South Africa.

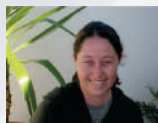
email: [dale@cape-eaprac.co.za](mailto:dale@cape-eaprac.co.za)



## Sian Holder - Consultant / ECO

Sian has a National Diploma in Nature Conservation, a BTech Nature Con (NMMU) and a Masters Degree in Environmental Education (Rhodes University). She worked at Tsitsikamma National Park as an Environmental Education Officer on environmental education programmes for Wilderness Foundation SA. She then served as the Experiential Education Manager and wilderness guide for Wilderness Foundation. She joined the environmental consulting vocation in 2008.

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## Onke Nandipha - ECO

Onke obtained a BSc in Environmental Sciences (2017) and a BSc Honours in Geography in 2018. He joined Cape EAPrac in July 2019, as an intern, and after gaining experience on various projects, has taken on the responsibility as full time On-Site Environmental Control Officer for a renewable energy development in Kenhardt, Northern Cape. His excellent communication skills in both English and Xhosa, combined with his knowledge and understanding of environmental management makes him a valuable asset on projects where language barriers are a constraint.

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## Louise-Mari van Zyl

Director / Principal Practitioner

Louise-Mari van Zyl holds a Masters degree in Geography & Environmental Sciences from the University of Stellenbosch. She worked as an Environmental Assessment Practitioner (EAP) since 2002 on projects in the Eastern, Southern, Western & Northern Cape provinces. She is registered as an EAP with the Environmental Assessment Practitioners Association of South Africa.

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## Carin Naudé

Business Administrator

Carin obtained a BBA degree through UNISA. She gained extensive experience in business management and administration since 1988. She joined Cape EAPrac in June 2008 and is responsible for the day to day administrative functions of the business. Her acquired knowledge and leadership skills enables the rest of the team to function efficiently in their respective fields.

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## Paul Buchholz

GIS Practitioner / Environmental Consultant

Paul joined Cape EAPrac in September 2022. He holds a MA in Environmental Management from the University Stellenbosch (2009). He is an experienced Geoinformatics and Environmental Specialist who has worked on multidisciplinary environmental and engineering projects in Africa since 2002. Paul is Registered GIS Practitioner with the South African Council for Professional & Technical Surveyors.

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## Mariska Nicholson

Project Assistant /  
Trainee Environmental Consultant

Mariska joined Cape EAPrac in April 2022. She completed her BSc in Geology in 2016, BSc Honours in 2017 and holds a MSc in Geology from the University of the Free State (2020). After working as a Geologist for two years, she joined our team as Project Assistant and is training to become an Environmental Assessment Practitioner.

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## Charmaine Mudau - ECO

Charmaine Mudau joined Cape EAPrac in September 2022. She holds a BA in Geography and Environmental Management from the University of the Free State (2014) and a BSc Honours in Geography from UNISA (2020). She joined our team as full time On-Site Environmental Control Officer for a renewable energy development in Kenhardt, Northern Cape.

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