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1 INTRODUCTION AND BACKGROUND

This Part 2 Amendment Assessment Report has been prepared in support of an application to amend a valid Environmental Authorisation issued in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, as amended. The application concerns the nature and design to an authorised watercourse crossing within the Kosmosdal mixed use development, situated within the City of Tshwane Metropolitan Municipality.

The amendment involves replacing the approved span bridge with a culvert bridge at the Rietspruit watercourse. This report assesses the environmental implications and impacts associated with the proposed change.

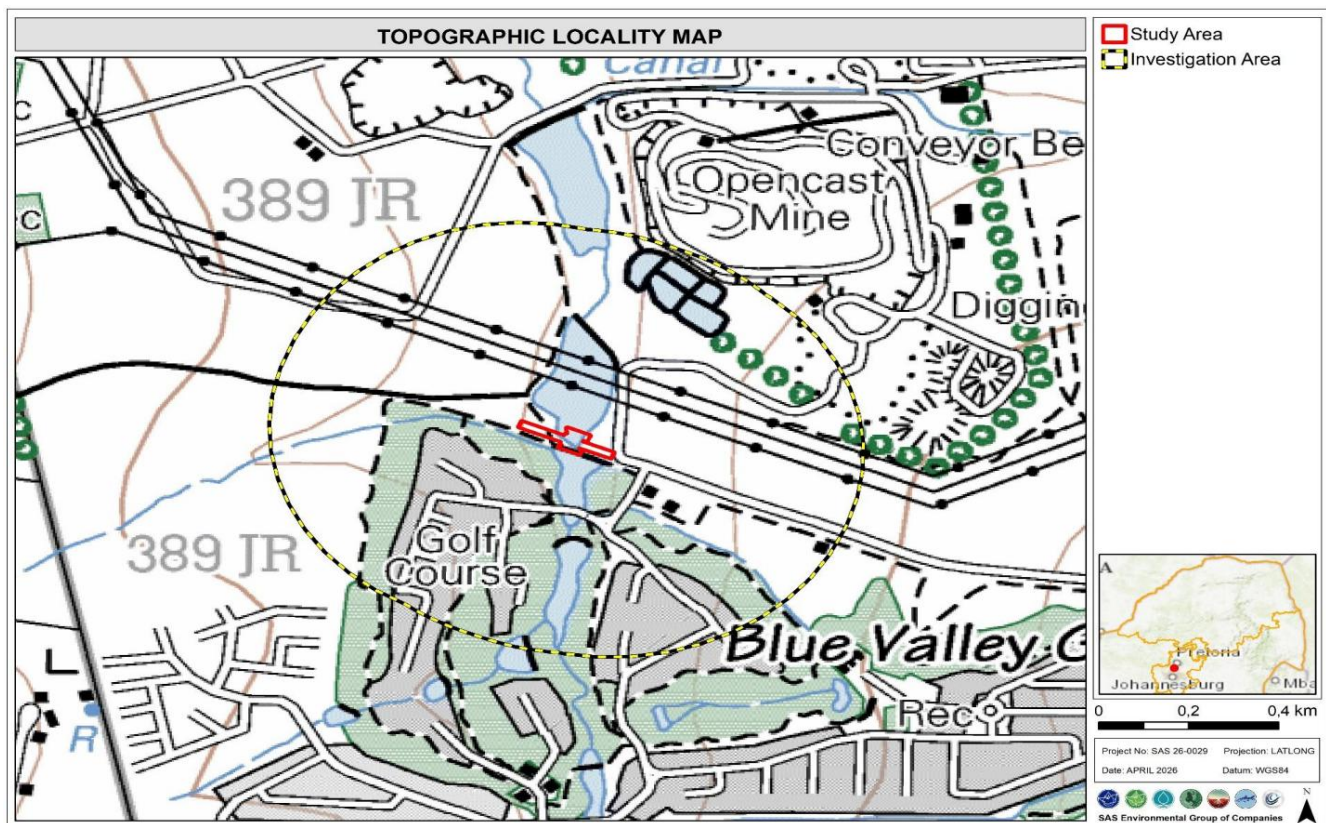


Figure 1: Locality Map

2 DESCRIPTION OF THE AUTHORISED ACTIVITY

The Environmental Authorisation under consideration was issued under reference number GAUT 002/15 16/E0011 on 24 May 2016 and remains valid until 24 May 2027. The Environmental Authorisation allows for the development of the Kosmosdal mixed use township and associated infrastructure including the construction of a bridge crossing over the Rietspruit watercourse. The authorisation holder is Samrand Development (Pty) Ltd

3 DESCRIPTION OF THE AUTHORISED BRIDGE

The authorisation provides for road infrastructure requiring a crossing of the Rietspruit watercourse to support vehicular access and connectivity within the township. The method statement describes the bridge design as a 20.8 m single-span bridge with a flat slab deck supported by precast concrete beams spanning between the abutments. This design would avoid the need for formwork in the riverbed during deck construction. The deck was to be aligned with the spruit's flow direction and positioned above the 1:100-year flood line to prevent overtopping during such flood events. Foundations were to be constructed during the dry season, with temporary drainage pipes installed across the spruit to minimise impacts on the watercourse.

A trench approximately 400 mm wide and up to 1 500 mm deep was to be excavated along the proposed reinforced-earth retaining walls. The trench would then be compacted and prepared for the concrete strip footing. The engineer would be required to confirm final stability to prevent displacement once the structure is loaded.

A concrete strip foundation was to be cast in horizontal steps, each approximately 400 mm wide and 150 mm deep, within the prepared footprints. Reinforced-earth precast concrete panels would then be placed on the strip foundation, with steel strips installed as required and compacted earth fill placed behind the panels.

Side slopes were to be constructed at gradients of approximately 1:2 to 1:3. The slopes would be covered with topsoil from site stockpiles and/or commercial sources, hydroseeded in accordance with the environmental consultant's specifications, and protected with additional non-degradable erosion-control measures where required.

Small concrete abutments were to be constructed on the reinforced-earth fill at the spruit. Precast concrete beams and planks would then be installed between the abutments, followed by in-situ casting of the concrete diaphragms and deck slab over the precast beams. Precast concrete parapets were to be installed on the bridge and parapet walls.

After construction, the site was to be reinstated in accordance with the EMPr. Disturbed areas would be rehabilitated, construction materials removed, and embankments topsoiled using stockpiled and/or commercially sourced material. The embankments would then be hydroseeded in accordance with the environmental consultant's specifications and protected with non-degradable erosion-control measures on the side slopes.

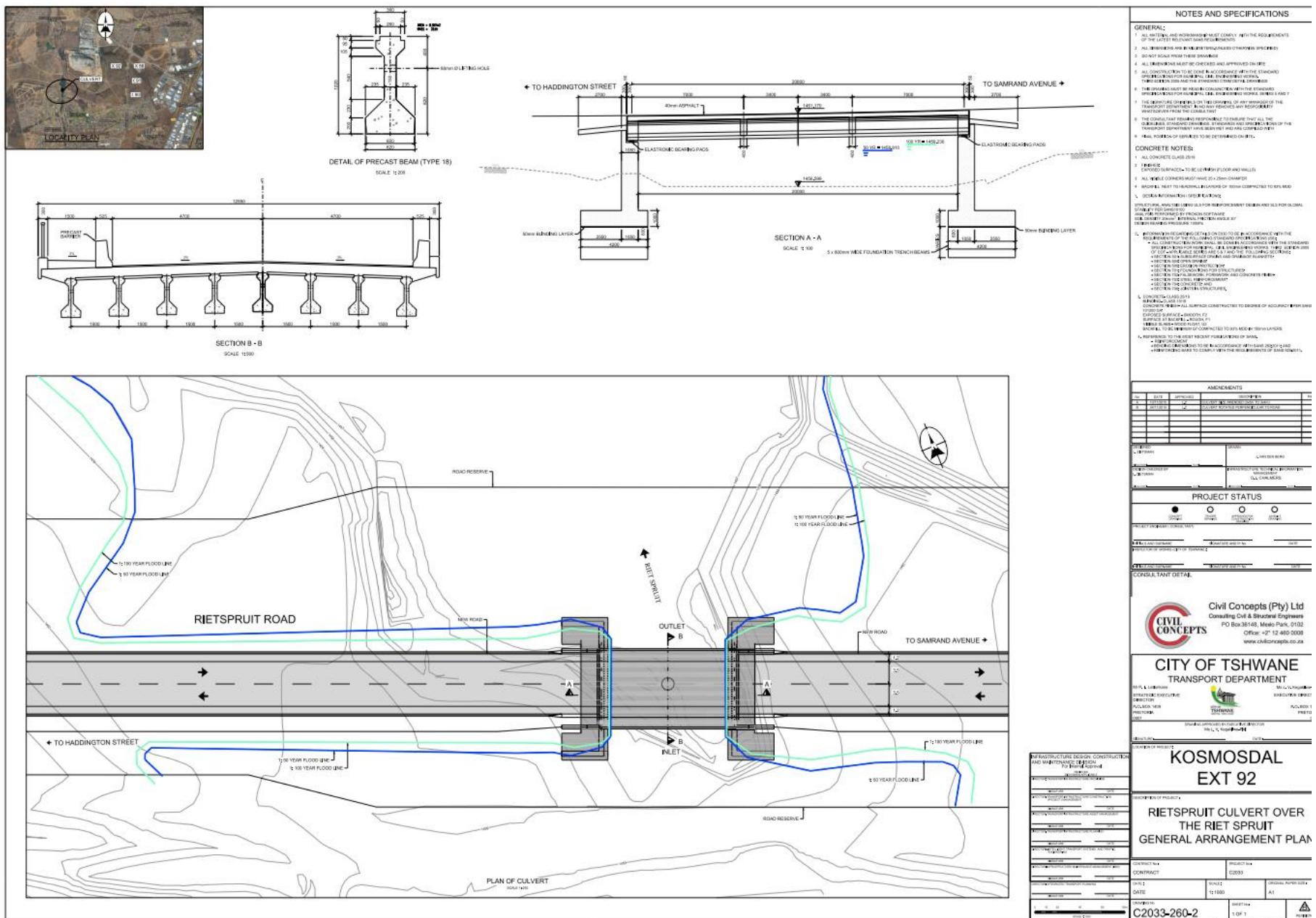


Figure 2: Original Bridge Design

4 DESCRIPTION OF THE PROPOSED AMENDMENT

4.1 Nature of the Amendment

The proposed amendment constitutes a partial amendment to the existing Environmental Authorisation and entails a change in the nature and design of a bridge crossing the Rietspruit. The originally approved span bridge is proposed to be replaced with a culvert bridge at the same authorised crossing location. The amendment does not result in the relocation of the crossing, the extension of the development footprint, a change in land use rights or zoning, or the introduction of new listed activities in terms of the EIA Regulations.

The amendment is therefore limited to a refinement of the engineering solution to achieve the same functional outcome as originally authorised.

4.2 Description of the Proposed Culvert Bridge

The preferred design comprises a precast box culvert bridge designed to safely convey flood flows while maintaining road connectivity across the Rietspruit watercourse. The proposed culvert bridge consists of ten precast rectangular box culverts, each measuring approximately 3.0 metres wide and 2.4 metres high, designed for a 1:50-year flood recurrence interval under inlet-controlled conditions.

Construction activities will include temporary diversion of the watercourse to allow construction within a dry working area, excavation and foundation preparation, construction of reinforced concrete invert slabs and inlet and outlet structures, installation of erosion and scour protection using gabion Reno mattresses, and rehabilitation of all disturbed areas following completion of construction.

An alternative pipe culvert configuration was evaluated during the detailed engineering design process; however, this option is not preferred due to its larger footprint and higher anticipated flow velocities, which could increase erosion and sedimentation risks.

4.3 Advantages and Disadvantages of the Proposed Culvert Bridge (Amendment Rationale)

The proposed change from the previously approved span bridge to a precast box culvert bridge presents several potential advantages and disadvantages. These are summarised below to motivate the amendment and to highlight aspects that require specific mitigation and method statements during construction.

4.3.1 Advantages (potential benefits)

- **Constructability and programme:** Precast units generally enable shorter in-channel construction time (relative to cast-in-place bridge superstructures), which can reduce the duration of temporary diversion and exposure of bare soils.
- **Quality control:** Factory-manufactured precast culverts can provide consistent unit quality and dimensional tolerances, supporting reliable hydraulic performance when installed correctly.
- **Footprint certainty:** The culvert bridge can be designed to fit within the previously authorised crossing footprint, avoiding additional land take beyond what was assessed in the original authorisation.
- **Hydraulic capacity at design event:** The culvert configuration has been designed to convey the applicable design flood (as per engineering design basis), supporting road connectivity and flood resilience.

- **Maintenance access:** A defined inlet/outlet arrangement can provide clear inspection points for blockage, sediment build-up and scour, enabling planned maintenance over the operational life of the crossing.
- **Cost and procurement practicality:** In many cases, precast box culverts can be procured and installed with less specialised formwork and temporary works than a span bridge, which may reduce construction complexity (subject to detailed design and contractor methodology).

4.3.2 Disadvantages / risks (potential adverse implications)

- **Greater in-channel disturbance during installation:** Culvert installation typically requires excavation across the channel and placement of an invert slab/bed treatment, which can increase short-term disturbance compared to a span bridge that passes over the channel.
- **Barrier to aquatic movement and geomorphic continuity:** If not designed and constructed appropriately (e.g., appropriate embedment, roughness, low-flow channel provision), culverts can create perched outlets, higher velocities or uniform beds that reduce ecological connectivity.
- **Blockage and debris management:** Culvert inlets may be more susceptible to blockage by litter and debris during storm events, which can increase upstream ponding/flood risk if not managed through design (trash racks where appropriate) and maintenance.
- **Scour/erosion risk at inlet and outlet:** Concentrated flows at culvert outlets may increase localised scour potential, requiring robust energy dissipation and erosion protection (e.g., Reno mattresses/gabions) and careful tie-in to existing bed/banks.
- **Construction sequencing constraints:** Temporary diversion, dewatering and working-in-the-dry controls are critical; poor implementation can elevate sedimentation, turbidity and downstream water quality impacts.
- **Visual and landscape character:** Culvert inlets/outlets and associated protection work can appear more engineered than a span bridge, potentially affecting the visual character of the river corridor (subject to rehabilitation and finishing).

Overall, the amendment is supported on the basis that the culvert bridge can achieve the same access and flood-conveyance function as the previously authorised span bridge within the authorised crossing footprint, provided that (i) hydraulic design assumptions are confirmed, (ii) aquatic and geomorphic continuity considerations are incorporated into the detailed design (where applicable), and (iii) construction method statements, erosion/sediment controls and rehabilitation requirements in the EMPr are strengthened to address the short-term increase in in-channel disturbance risk.

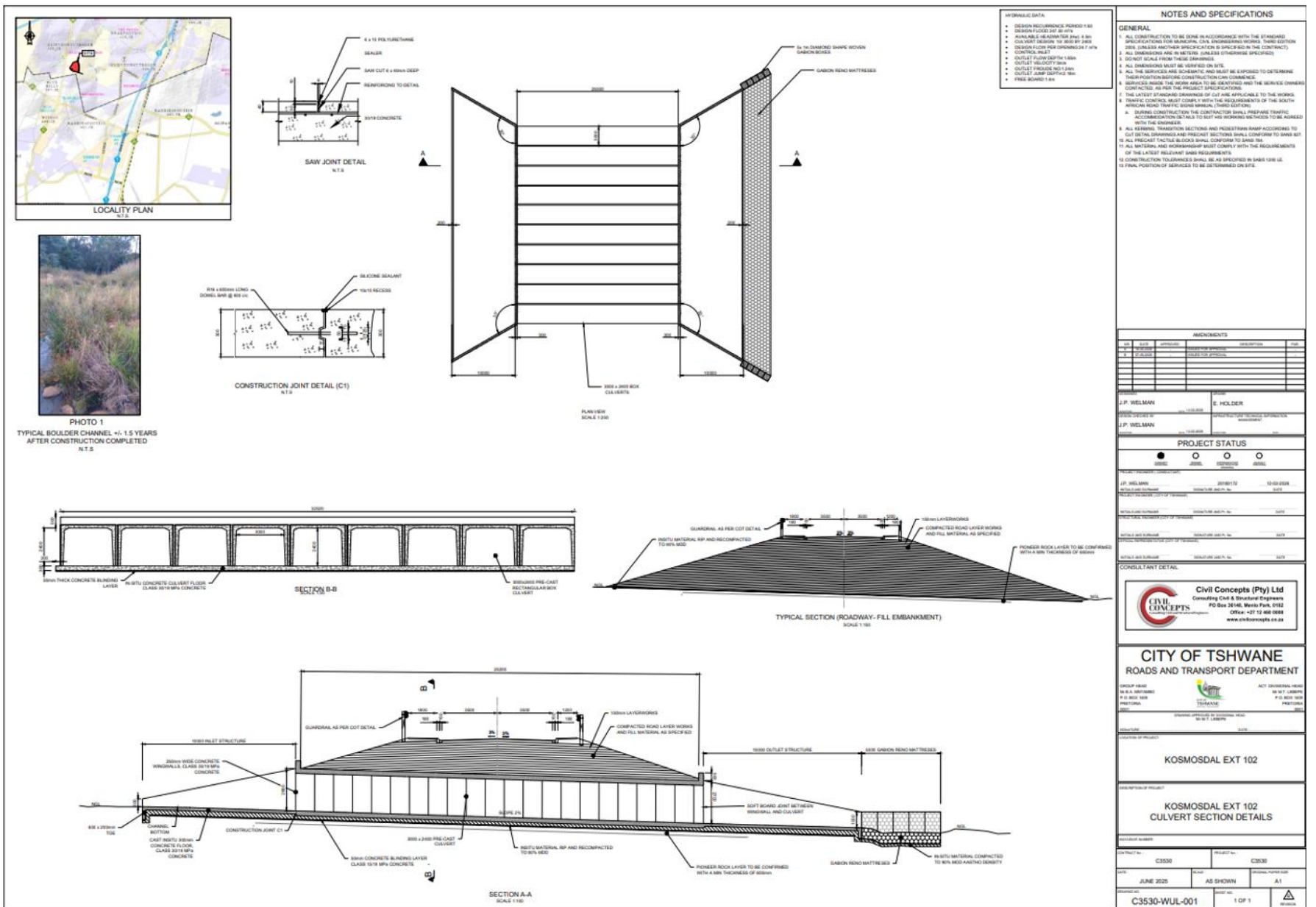


Figure 3: Proposed Bridge Design

Culvert Bridge Rietspruit: Gaut 006/26-27/E0002

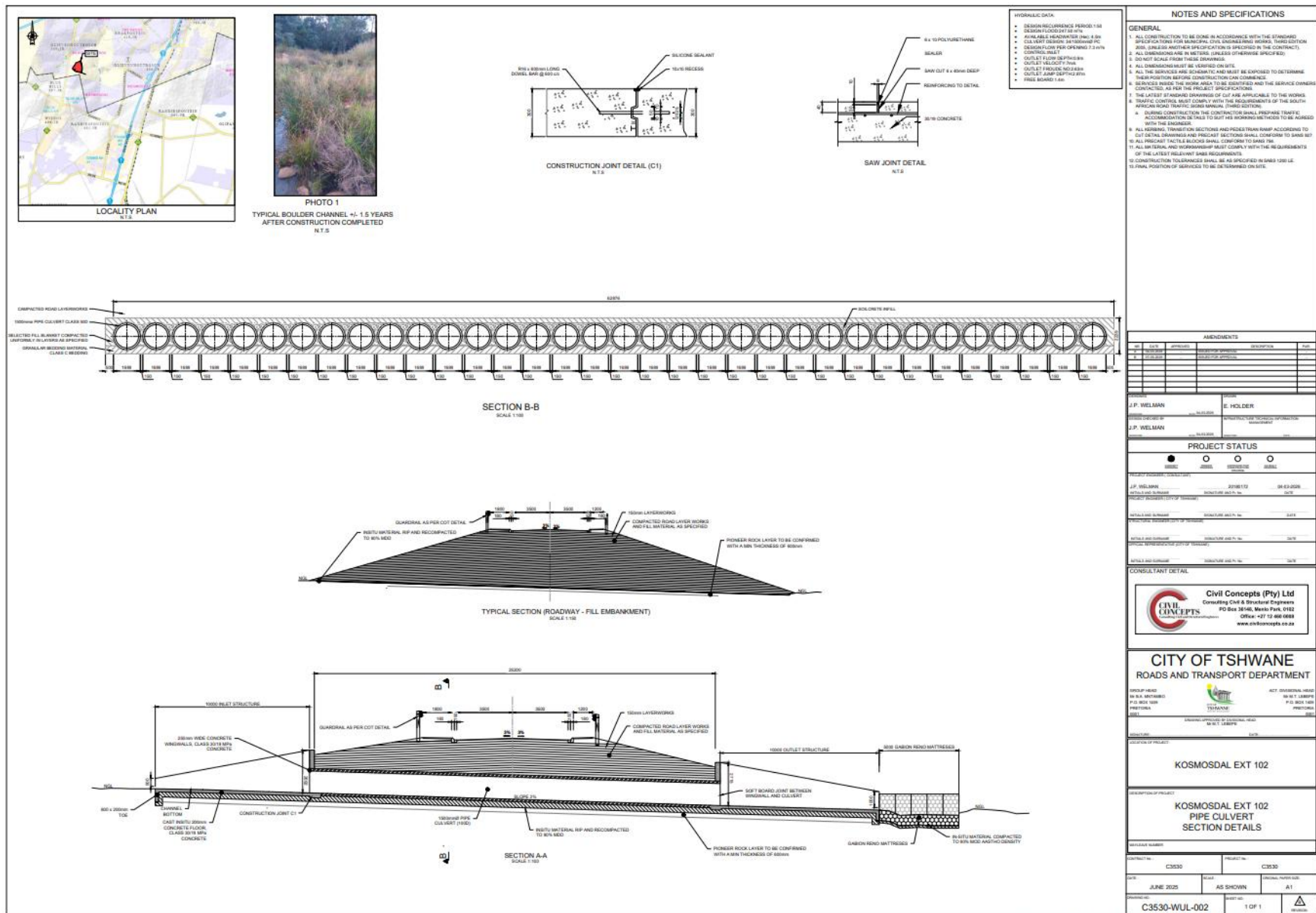


Figure 4: Alternative Bridge Design

5 LEGISLATIVE AND POLICY CONTEXT

The amendment application has been assessed within the context of applicable national, provincial and municipal legislation, policies and planning instruments, including those relevant to the City of Tshwane Metropolitan Municipality.

National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended)

At national level, the proposed amendment is guided by the provisions of the National Environmental Management Act, 1998, particularly Section 24, which regulates activities that may have a significant impact on the environment. The Environmental Impact Assessment Regulations, 2014, as amended, specifically Regulation 16, provide for the amendment of a valid Environmental Authorisation where changes to an authorised activity are proposed.

The National Water Act, 1998 (Act No. 36 of 1998)

The National Water Act, 1998, is also applicable, particularly Sections 21(c) and (i), which regulate activities that alter the flow, bed or banks of a watercourse. The aim is to ensure the Republic's water resources are protected, used, developed, conserved, and controlled. According to the Act, any proposed water uses must be specified, registered, and/or licensed. Similarly, any modifications to drainage lines on site must be investigated regarding water use requirements. The proposed amendment is within a watercourse, and therefore, compliance with the National Water Act is being addressed through a separate Water Use Licence Amendment process.

The National Environmental Management: Biodiversity Act (Act 10 of 2004)

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA. Areas of high biodiversity need to be protected. The site has no important biodiversity features. Should any protected species be found on site, these will be managed in consultation with Gauteng Department of Environment (GDEnv).

Gauteng Provincial Environmental Management Framework

At provincial level, the amendment has been considered in relation to applicable Gauteng Environmental Management Frameworks and the Gauteng Conservation Plan, which inform environmental sensitivity and biodiversity priorities. The proposed amendment does not conflict with identified provincial conservation priorities and remains within an area that was previously assessed and authorised for infrastructure development.

Red List Plant Species Guidelines

The guidelines aim to promote the conservation of Red List Plant Species in Gauteng, which are species that face the risk of extinction in the wild. Protecting Red List Plant Species, the conservation of diverse landscapes is promoted, forming part of the overall environmental preservation of diverse ecosystems, habitats, communities, populations, species, and genes in Gauteng. No Red Listed plant species were found within the proposed amendment site.

City of Tshwane Metropolitan Spatial Development Framework

At municipal level, the amendment aligns with the City of Tshwane Metropolitan Spatial Development Framework and the applicable Regional Spatial Development Frameworks governing the Kosmosdal area. The proposed design change does not alter approved land use rights or zoning in terms of the City of Tshwane Town Planning Scheme.

City of Tshwane Bioregional Plan: The City's Bioregional Plan is a municipal biodiversity planning instrument that identifies biodiversity priority areas and ecological support areas (commonly mapped as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)) and provides associated land use guidelines to inform development planning, environmental authorisation processes and municipal decision making. In the context of a watercourse crossing, the Bioregional Plan is relevant to confirming whether the affected river corridor and its buffer function as an ecological corridor or biodiversity priority area and, if so, ensuring that the design and method statements avoid sensitive features as far as reasonably practicable and apply appropriate mitigation (e.g., minimising in channel works, controlling erosion/sedimentation, maintaining ecological connectivity and rehabilitating disturbed riparian habitat). As the proposed amendment is restricted to a design refinement within the previously authorised crossing footprint, it does not introduce additional transformation beyond that already assessed; however, the Bioregional Plan's mapping and guidelines are used as a screening and motivation line to demonstrate continued alignment with municipal biodiversity priorities.

City of Tshwane Environmental Management Policy

The amendment further aligns with the City of Tshwane Environmental Management Policy, which promotes sustainable development and the responsible management of natural resources, including watercourses and floodplains. The proposed culvert bridge design is consistent with the City of Tshwane's stormwater management principles and municipal engineering standards, ensuring the safe conveyance of stormwater and flood flows while minimising environmental risk. The design also accords with City of Tshwane roads and transport standards, including safety and flood resilience requirements.

Overall, the proposed amendment is consistent with the applicable legislative and policy framework at national, provincial and municipal levels.

6 ASSESSMENT OF ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE AMENDMENT

The environmental impacts associated with the proposed amendment were assessed in relation to the impacts previously authorised under the existing Environmental Authorisation. The assessment focused on determining whether the design change results in new impacts or increases the significance of impacts previously assessed.

6.1 Pre-Construction phase

Pre-construction impacts are like those that would have resulted from the implementation of the authorised activity. Therefore, except where emphasis is placed on impacts, no additional assessment was done for this application.

Table 1: Potential impacts and mitigation measures during the pre-construction phase

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
PERMIT AND PRECONSTRUCTION REQUIREMENTS			
Non-compliance with legislative and policy requirements		- All permits and legal requirements and policy directives must be complied with as required by authorities. - Environmental Policy to be developed prior to the commencement of construction, to ensure integration of environmental objectives into the day-to-day operations of the Project. - Environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. - A health and safety plan is to be developed prior to the commencement of construction to identify and avoid work related accidents.	
Fauna and Flora search		- A search and rescue operation from sensitive flora and fauna to be carried out before commencement of construction - Demarcation of the construction area	
Hydrology Location of the construction site could result in pollution or siltation of water feature		- The Reitspruit on the proposed development footprint must be protected according to the provisions of the EA. - Stormwater Management Plan must be compiled and implemented during the construction and operation of the project, with the intent of protecting the water feature.	

6.2 Construction phase

Table 2: Potential impacts and mitigation measures during the construction phase

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
ENVIRONMENTAL AWARENESS AND TRAINING			
Lack of sufficient knowledge and understanding of the potential impacts of construction or the requirements of the EMPr, leading to impacts identified under each aspect.		- Environmental awareness training sessions shall be run for all personnel on site. Contractor general site staff are to attend an environmental induction training at the start of the project. - In addition, all staff shall attend the weekly environmental toolbox talks to be provided by the EO.	
SITE ESTABLISHMENT			
Site access/routes - Construction of access roads through wetland leading to adverse impacts on the wetland. - Poor control of vehicular movement and management of edge effects leading to impacts on environment		- The main access points to the project site must be clearly signposted and delivery areas must be communicated to all suppliers and sub-contractors. - Movement of all vehicles to remain on designated routes. - The vehicles shall not exceed a speed of 40 km/h on gravel or earth roads on Site. - No indiscriminate driving through the wetland	
Ablution facilities - Inadequate and/or poorly positioned facilities leading to limited use and or pollution of wetland - Release of odours due to poor maintenance of facilities		- The Contractor shall provide adequate toilets at the Contractor's Camp and approved points around the designated work area to allow easy access to all employees on site. - No toilets to be located within the wetland bufferzone. - The Contractor shall keep the toilets in a clean, neat and hygienic condition. - Toilets are to be emptied prior to builders' holidays and serviced once a week, to ensure that no odours originate from this source and to ensure hygienic conditions for employees.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
Site preparation for civil works within the delineated extent of the Rietspruit including stockpiling of construction equipment and storage of materials, vehicles and machinery; and possible indiscriminate Vehicle movement through the nonmarginal zones of the riparian corridor leading to: • Dust generation from exposed soil potentially resulting in the smothering of riparian vegetation and biota, and altering surface water quality; • soil destabilisation leading to further sedimentation, or conversely, soil compaction leading to increased surface runoff into downstream/ downgradient freshwater ecosystem; • Potential further spread of alien and invasive plant species (AIPs) from disturbed soil; and • Contaminant spillage into the freshwater ecosystem from machinery and vehicle operation.		• Access to the site will be from existing access roads as far as feasible; this must be communicated to personnel, to avoid indiscriminate driving through the freshwater ecosystems; • The 15 m ecological buffer must be implemented and demarcated on site where practical to mitigate edge effects. Where dense indigenous vegetation provides a natural buffer, the demarcation of the buffer (and RoW) may be implemented at the discretion of the Environmental Control Officer (ECO). • The outer boundary of the 5 m construction RoW must be clearly demarcated (where feasible) using a suitable barrier or material by an ECO and both the buffer area and the construction RoW are to be marked as 'no-go' areas to ensure that construction activities do not encroach into the freshwater environment and associated buffer area except where essential. • Only authorised construction personnel may be permitted to enter these 'no-go' areas as part of the construction and subsequent rehabilitation activities, where required. • Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the 15 m ecological buffer of the freshwater ecosystems and preferably the 32 m NEMA ZoR, where possible; • Stockpiles must be placed outside the delineated freshwater ecosystems, the associated 15 m ecological buffer and preferably the 32 m NEMA ZoR (the latter where practical);	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
		• Site clearing activities are to remain within the authorised footprint and vegetation clearing is to be limited to what is essential within that active footprint, except for alien vegetation which may be carefully removed; • Avoid unnecessary trampling of vegetation irrespective of the vegetation being associated with the freshwater ecosystems or the surrounding terrestrial area; • Retain as much indigenous vegetation as possible (riparian / wetland and terrestrial); • Dust suppression measures must be implemented throughout construction to prevent excessive dust which may smother freshwater vegetation; and • In all events all machinery and vehicles used during construction must be maintained and equipped with drip trays to prevent oil, petrol or diesel leaks. If breakdowns occur these must be towed offsite to the designated areas/workshops. • The proposed control measures will ensure that incidental oil spills and leakage are minimised onsite and thus limit any opportunities of water contamination and water quality deterioration	
SITE CLEARANCE			
Vegetation clearance stripping of topsoil within the riparian habitat and exposure of soil leading to: • increased runoff and erosion, and thus increased likelihood for sedimentation of the freshwater ecosystem;		• No indiscriminate movement of vehicles through the freshwater ecosystem may be permitted. All vehicles must remain outside of the 15 m ecological buffer, unless required as part of specific construction activities for a short period of time. This must also be limited to the drier summer season, where possible, to reduce risk significance;	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
• Loss of riparian habitat and ecological structure resulting in impacts to biota; • Increased sedimentation, contributing to further smothering of vegetation in the downstream reaches; • proliferation or spread of alien and/or invasive vegetation due to disturbances; and • further decreased ecoservice provision of the freshwater ecosystem.		• Topsoil excavated from construction areas must be stored separately and may not be contaminated. The topsoil is to be reused on completion of construction for rehabilitation; • Control alien vegetation, specifically invasive and pioneer species which are already well-established and may find a niche to encroach disturbed areas. Ensure AIPs are managed post construction until suitable basal cover is achieved; and • Once all vegetation clearing is completed, all AIP and any removed excess material must be disposed of at a licensed refuse facility and may not be mulched or burned on site.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
Topsoil management - Groundbreaking and excavations within the freshwater ecosystem leading to excess soil being removed: - resulting in altered pattern flow and timing of water in the freshwater ecosystem; - disturbances of soil leading to ponding of water due to over compaction of soil in some areas, increased AIP proliferation, and in turn altered riparian habitat and runoff patterns; - altered runoff patterns, leading to increased erosion and sedimentation of the downstream riparian habitat; and - Potential erosion and formation of preferential flow paths due to disturbed soil and inappropriate slopes (i.e. too steep) resulting in additional sedimentation of the freshwater ecosystem.		- The construction footprint must be limited to the proposed footprint and 5 m construction RoW (i.e. the authorised development footprint area) only; - Limit construction equipment within the riparian ecosystems to what is essential; and - Sediment control devices must be constructed in-situ prior to construction activities. - resh concrete and cement mortar should not be mixed near the riparian ecosystems. Mixing of cement may be done within the construction camp, however it may not be mixed on bare soil, and must be within a lined, bound or bunded portable mixer. Consideration must be taken to use ready mix concrete; - No mixed concrete shall be deposited directly onto the ground or within the riparian ecosystems. - Any areas that require manual application of cement require that the mixed road surfacing materials be placed on a batter board or other suitable platform/mixing tray until it is deposited; - A washout area must be designated outside of the riparian ecosystems, and wash water should be treated on-site or discharged to a suitable sanitation system; At no point may batter boards/mixing trays or cement trucks be rinsed off on site and run-off water be allowed into the riparian ecosystems; - Cement bags (if any) must be disposed of in the demarcated hazardous waste receptacles and the used bags must be disposed of through the hazardous substance waste stream; and - Spilled or excess concrete must be disposed of at a suitable landfill site. Chain of custody documentation must be provided.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
HYDROLOGY			
- The bridge construction could result in pollution or siltation. - Increased stormwater run-off volumes and velocity could result in erosion - In-channel reconstruction work, leading to: - removal of instream and marginal riparian vegetation; - Movement of construction machinery within channel, leading to benthic disturbance including potential damage to aquatic biota egg banks, instream sediment disturbance, - compaction of soil; - Disturbances of soil as a result of removal of infrastructure and replacement with culverts, leading to localised ponding of water, over compaction of soil due to movement of machinery, damage to fish and macroinvertebrate egg banks, increased AIP proliferation and altered instream and riparian habitat, flow patterns and sediment distribution;		- Conditions in the Water Use License as well as Stormwater Management Plan to be implemented to protect the wetland. - Any rills or erosion channels shall be backfilled and compacted. Stabilisation of cleared areas to prevent and control erosion shall be actively managed. - Provision shall be made for various methods, namely, brush-cut packing, mulch or chip cover, straw stabilising, silt fencing bailing, watering, soil binders and anti-erosion compounds, mechanical cover or packing structures. - Due to the clearing of vegetation, the volume of stormwater run-off will increase as well as velocity. Ensure that energy dissipation measures are installed and repaired regularly. - Proper stormwater infrastructure will have to be constructed and maintained in accordance with a Stormwater Management plan. - Water must be diverted into the downstream reaches, around the construction area. - Water must be allowed to always recharge the downstream reaches, although sediment traps must be installed around any activities located upgradient of the river to ensure that volumes of sediment entering the river are minimised. Sediment traps are to be inspected daily and accumulated sediment to be removed by hand on a weekly basis; - Sediment traps must be installed either every 15m downstream for any works for a length of 100 m, or, if this is not feasible, sediment traps must be installed around the downgradient boundary of the construction work. The determination of appropriate placement of such sediment traps may be at the discretion of the ECO.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
- Altered runoff patterns, leading to increased erosion and sedimentation of the downstream riparian and instream habitat; and - Potential erosion and formation of preferential flow paths as a result of disturbed soil, and inappropriate slopes (bank and stream bed) resulting in altered sediment distribution and altered benthic characteristics affecting aquatic fauna and flora.		- It is recommended that a suitably qualified freshwater specialist and ECO monitor any flow diversions as well as sediment traps at least bi-monthly during the construction period to monitor the conditions of the freshwater ecosystems during construction and after flows are redirected through the new infrastructure; - Temporary access crossings (if required) must intersect the river at a right angle to minimise disturbance to the riparian ecosystems; - The area outside the 5 m construction RoW of the proposed repairs must be demarcated as a no-go area. No vehicles or personnel are permitted within this area; - Material to be used as part of the proposed repairs must be stockpiled outside the 32 m NEMA ZoR of the river to prevent additional sedimentation thereof and to avoid any other vegetation being impacted by the construction activities. These stockpiles may not exceed a height of 2 m and should be protected from wind and precipitation using tarpaulins or a suitable geotextile; and - Any remaining soil following the completion of the proposed repairs are to be spread out thinly in an area within the riparian zone to aid in the natural reclamation process	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
MATERIAL STORAGE			
General Appropriate storage of material on site to avoid negative impacts on the environment		- Materials shall be appropriately secured to ensure safe passage between destinations. Loads shall have appropriate cover to prevent them from spilling from vehicles during transit. - All building materials should be stored away (at least 50m) from watercourses or wetlands, and the areas bunded appropriately such that there will be no runoff from these areas towards aquatic systems. All building materials should be removed after construction.	
Hazardous substances Inadequacy of procedures and methods for handling and storage leading to danger to employees, public and environment.		- Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDS shall be followed in the event of an emergency. - The Contractor shall provide a Method Statement detailing the substances/materials to be used, together with the storage, handling and disposal procedures. - No paint products and chemical additives and cleaners such as thinners and turpentine may be disposed of on Site. - The Contractor shall be responsible for any clean-up resulting from the failure by his Employees or suppliers to properly secure transported materials, in the event of a spill	
Equipment maintenance and storage Possible pollution from equipment and vehicles		- Drip trays shall also be provided in construction areas for stationary plants (such as compressors) and for "parked" plants (such as scrapers, loaders, vehicles). - All vehicles and equipment shall be kept in good working order and serviced regularly. - Leaking equipment shall be repaired immediately or removed from the Site	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
WASTE MANAGEMENT			
Lack of control and management systems leading to pollution, improper disposal or handling of waste		- The Contractor shall ensure that the Waste Management Plan is implemented. - A method statement shall also be developed by the contractor - The contractor shall keep detailed records of all the waste removed, transported, handled, stored and accepted at the registered designated facility, together with proof of recycling or legal disposal at a registered landfill site (disposal certificates). - No refuse or waste material will be disposed of by burying or burning on site - All the waste generated must be temporarily stored at a preselected area on site to be carted to a registered landfill site allowed to take building rubble - The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the local authority;	
General waste-storage and management		- A temporary waste storage point shall be determined and established on site by means of demarcation. This storage points shall be accessible by waste removal vehicles. - The Contractor's camp and working areas shall be cleaned on a daily basis. - Litter and waste shall be stored in scavenger- and weather-proof bins. The Contractor shall provide sufficient bins with lids onsite. - To facilitate recycling, it is recommended that several bins be provided at each location, and that such bins be clearly marked according to the category of waste being recycled (e.g. paper, metals, plastics, glass etc.) Bins shall not be allowed to become overfull and shall be emptied regularly - The waste may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the SE has approved. Any refuse not being re-cycled must be disposed of at a registered waste disposal facility. - Empty cement bags must be collected by the end of every day and before rain events and shall be stored in bins that are either placed under cover or have been fitted with lids.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
Hazardous waste		- Hazardous waste is to be stored in an enclosed and bunded area. This waste shall be disposed of at a registered hazardous waste disposal site. Proof of disposal shall be kept on site. - Storage and disposal shall comply with relevant legislation.	
Builders Rubble		- Rubble shall be temporarily stockpiled in a waste skip or a central stockpile. Any rubble not being recycled or reused shall be removed from site to a registered approved landfill site. - No plastics, shrink wrap, paint buckets or any other debris that does not constitute clean building rubble, shall be mixed with building rubble.	
FAUNA AND FLORA			
- Construction activities leading to migratory corridor alterations. - Indiscriminate driving through surrounding open veld and construction of access roads within sensitive habitat areas. - Movement of construction vehicles and access road construction impacting on floral habitat. - Poor control of vehicular movement leading to impacts on flora.		- Search and Rescue of SCC conducted prior to construction and continued during operations - Works to be confined to the designated site area. No disturbance to be permitted on areas outside of the Leased Area. - Induction of workers to include topics on the importance of preserving habitats of animals and prevention of poaching. - The intentional killing of any animals should be strictly prohibited. - Vehicles are not allowed to drive through sensitive areas. - Except where necessary for the carrying out of the works, and location of structures flora shall not be removed, damaged or disturbed. - Work areas to be kept to the minimum to reduce habitat loss. - Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. - Materials should not be delivered to the site prematurely which could result in additional areas being cleared or affected. All construction related vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the proposed development activities.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
EROSION CONTROL AND SEDIMENTATION			
Soil erosion and sedimentation - Erosion, degradation and loss of topsoil due to construction activities as well surface and stormwater run-off. - Sedimentation dues to soil disturbance		- The Contractor shall take all reasonable measures to limit erosion and sedimentation due to the construction activities. - Where erosion and/or sedimentation, occurs rectification shall be carried out immediately. - Any rills or erosion channels developed during the construction period or during the maintenance period shall be backfilled and compacted. Stabilisation of cleared areas to prevent and control erosion shall be actively managed. - Consideration and provision shall be made for various methods, namely, brush-cut packing, mulch or chip cover, straw stabilising, silt fencing bailing, watering, soil binders and anti-erosion compounds, mechanical cover or packing structures. - Traffic and movement over stabilised areas shall be restricted and controlled, and damage to same shall be repaired and maintained. - Topsoil removed should be stored separately from all stockpiled materials and subsoil, according to the stockpiling methods as described below. The stockpiled topsoil should be used for rehabilitation and landscaping purposes after construction has been completed.	
ARCHAEOLOGY AND PALAEOLOGY			
Disturbance of sites of archaeological, historical and cultural significance		- Although no sites or objects of archaeological, historical and cultural significance identified, if during construction any finds are made, the operations must be stopped and a qualified archaeologist contacted for an assessment of the find and to make recommendations - It is advisable that an information section on cultural resources be included in the SHEQ training given to contractors involved in surface earthmoving activities. These sections must include information on Heritage; Graves; Archaeological finds; and Historical Structures.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
NUISANCE MANAGEMENT			
Aesthetics and Visual - Site clearing and removal of vegetation could partially alter the landscape as viewed from the surrounds of the site, - Siting and treatment of temporary structures and construction equipment such as cranes could be visually intrusive, albeit for a short period.		- The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area. - The Contractor shall supply and maintain adequate and suitable containerized facilities for the storage of materials. All site establishment components shall be positioned to limit visual intrusion on neighbours and the size of the area disturbed. - The type and colour of roofing and cladding materials on temporary structures shall be selected to reduce reflection. - The Contractors' camp shall be fenced with a fence height of at least 1.8m, and the camp area shall be screened via the attachment of shade cloth to the fence surrounding the site camp, where practical. - Phased, rather than indiscriminate clearing of the site to be undertaken.	
Dust control Dust pollution on site which would affect adjacent developments as a result of construction activities and vehicular movement on site.		- Measures to minimise the generation of dust as a result of construction activities to be implemented - Such dust control measures may include the stabilization of disturbed areas via the mechanical surface wetting or chemical stabilisation. In extreme instances, the use of specific dust suppressant additives may be necessary in order to limit dust generation from haul roads. - During high wind conditions, the Contractor shall comply with the SEs instructions regarding dust- suppression measures. The SE may request the temporary cessation of all construction activities where wind speeds are unacceptably high, and until such time as wind speeds return to acceptable levels. - It is recommended that the Contractor maintains a dust suppression register, which is to be retained on site.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
Noise management likely increase in noise pollution from construction activities and vehicles		- The noisiest construction activities will, wherever possible be limited to normal working hours, unless otherwise permitted. Working hours in terms of the approval shall be adhered to. - If works are to take place outside of normal working hours, the EO and the SE are to be notified and disturbance to the surrounding residents or land users is to be prevented.	
CONCRETE AND CEMENT WORK			
Cement powder has a high pH, the spillage of dry cement powder and concrete slurry will thus affect both soil and water pH adversely. Careless handling of cement products resulting in spillage can have detrimental effects on the surrounding environment.		- A Method Statement indicating the layout and preparation of the batching plant facility will be required. - Cement is to be stored in a secure weatherproof location to avoid contamination of the environment. - All runoff from batching areas shall be strictly controlled so that contaminated water does not enter stormwater, or groundwater. - Mixing trays must be used at all mixing and supply points. Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment. - Suitable screening and containment shall be in place to prevent windblown contamination associated with bulk cement silos. - All visible remains of excess concrete shall be physically removed to an approved waste site on completion of the plaster or concrete pour section and disposed of.	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
SAFETY AND SECURITY			
Risk to public and construction staff.		- Members of the public adjacent to the construction site should be notified of construction activities in order to limit unnecessary disturbance or interference. - Construction activities will be undertaken during daylight hours and not on Sundays. Ensure the appointment of a Safety Officer to continuously monitor the safety conditions. - All construction staff must have the appropriate PPE. - The construction staff handling chemicals or hazardous materials must be trained in the use of the substances and the environmental, health and safety consequences of incidents. - A security guard should be appointed on site to prevent any loss of materials and damage to construction equipment.	
EMERGENCY PROCEDURES			
Fire		- Emergency Procedures as detailed in the EMPr must be implemented - The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. - The Contractor shall ensure that employees are aware of the procedure to be followed in the event of a fire.	
Accidental leaks and spillages		- The Contractor shall ensure that employees are aware of the procedures to be followed for dealing with spills and leaks, which shall include notifying the relevant authorities. - Materials and equipment for dealing with spills and leaks including spill kits must be available on site at all times. - In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. The spill needs to be treated and disposed of in accordance with the Method Statement.	
SITE CLEAN UP AND REHABILITATION			

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
Site clean-up Unkempt site due to remnants of construction material on site		- The Contractor shall ensure that all temporary structures, equipment, materials, waste and facilities used for construction purposes are removed upon completion of construction. - The site clean-up shall be to the satisfaction of the ECO.	
Rehabilitation- rehabilitate the disturbed areas (site camp, storage area and access routes) - Rehabilitation of the impacted reaches of the freshwater ecosystems including: - Re-sloping, reprofiling and revegetation of the river banks to prevent future erosion; and - AIPs removal.		- Upon completion of construction and rehabilitation the ECO should assess and approve the adequacy of the rehabilitation and ensure that sufficient levels of rehabilitation have been undertaken to allow re-establishment of vegetation - Where appropriate, the contractor shall employ a botanist with experience in restoration of grassland areas to rehabilitate areas damaged by construction activities. - Topsoil removed should be used for rehabilitation and landscaping purposes after construction has been completed. - The soil in these areas should be ripped 200mm deep and then hydro-seeded with an indigenous grass-seed mix. These areas should be monitored until 80% coverage has been achieved and are established. - Rehabilitation of the impacted reaches of the freshwater ecosystem and the associated 15 m ecological buffers must be undertaken. This must include clearing of all AIPs and reinstatement of indigenous wetland/riparian vegetation within the disturbed footprint; - Where applicable for the AIPs, care must be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used and that water contamination is avoided; and 4. Following construction of the proposed road repairs a suitable alien invasive management plan must be developed by an appropriately qualified specialist and must be implemented accordingly to ensure that AIPs do not become established within the areas disturbed by construction and/or decommissioning activities.	

6.3 Operational phase

Table 3: Potential impacts during operational phase

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
SOIL MANAGEMENT			
Erosion management Exposed areas may be susceptible to erosion		- Regular inspection of stormwater berms. - Revegetation of all areas subject to vegetation removal. Use of local indigenous vegetation to prevent erosion potential and to bind the soil. - Regular inspections and maintenance of storm water drains and culverts for blockages. - Compacted areas to be ripped and revegetated (refer to Method Statement), where compaction is no longer required.	
OPERATION AND MAINTENANCE			
- Operation and maintenance of the culvert ridge and road crossing. - Monitoring of structural integrity of the culvert bridge and road crossing including: - Proactive monitoring to ensure structural integrity is maintained and to identify early signs of erosion due to potential blockage or breakages.		- Routine maintenance of the culvert bridge and road crossing must be undertaken, particularly after high-rainfall events, to prevent concentrated flows, inadequate drainage and related erosion. - The Operation and Maintenance Manager must monitor stormwater runoff from the road crossing to ensure it does not cause erosion within the freshwater ecosystem. Runoff should disperse broadly across the landscape, supported by adequate surface roughness such as vegetation and rocky areas. - Road maintenance activities must include erosion monitoring, particularly at tie-in points. - If erosion caused by the road crossing is identified, the affected area must be rehabilitated by infilling erosion gullies and revegetating with suitable indigenous species. Locally sourced rocks may also be used to stabilise erosion-prone areas and support natural flow dispersion. - Should the culverts require replacing and/or concrete works, all control measures as stipulated in Activity 3 as applicable above must be implemented to ensure no negative impacts to the receiving freshwater environment occur;	

Aspect/impact	Significance before mitigation	Mitigation and Management Measures	Significance after mitigation
		- Sediment traps must be installed downstream of where any maintenance works are being undertaken; and - Any vegetation clearing (as part of the road maintenance and upkeep) must be undertaken by hand within the freshwater ecosystem crossing. No machinery is allowed to operate within the freshwater ecosystem.	
REMOVAL OF ALIEN VEGETATION			
- Ongoing AIPs removal (where required). - Compaction of soil and loss of habitat as a result of ongoing disturbance from vehicles and equipment; - Impacts to water quality as a result of the application of herbicides; and - Disturbance of soil which could lead to erosion.		- Ensure AIPs are managed post construction until suitable basal cover of indigenous vegetation is achieved; - It is considered imperative that all works pertaining to removal of AIPs be undertaken during the drier months to limit surface water contamination; - After AIPs have been removed, the soil surrounding these areas must be suitably loosened on completion of AIP removal and revegetated to prevent erosion; and - An annual follow up should be undertaken for at least 3 years post construction.	

7 PUBLIC PARTICIPATION PROCESS

A public participation process will be undertaken for this amendment application to ensure that Interested and Affected Parties (I&APs) and organs of state are provided with a reasonable opportunity to review the proposed amendment, raise issues and submit comments for consideration prior to a decision being made by the competent authority. The process will be implemented in accordance with the relevant requirements of the EIA Regulations, 2014 (as amended), and will be proportionate to the limited nature of the design refinement (i.e., a change in crossing structure within the previously authorised footprint).

- **Update and verification of the I&AP register:** The existing project I&AP database compiled during the original authorisation process will be reviewed, updated and used as the primary notification list. Additional stakeholders may be added based on current site context and specialist inputs.
- **Notification of the amendment process:** Registered I&APs and relevant organs of state will be notified of the amendment application and the availability of the Amendment Assessment Report (and any supporting documentation). Notifications will be issued using appropriate methods (e.g., email and/or written correspondence) and will indicate how and by when comments can be submitted.
- **Access to information:** The Amendment Assessment Report will be made available to I&APs for review via an accessible electronic distribution method and/or a suitable public viewing location, as appropriate.
- **Comment period:** A formal comment period will be provided, during which I&APs may submit written comments and questions. All submissions received within the comment period will be captured and considered.
- **Compilation of a Comments and Responses Report (CRR):** All comments received will be recorded in a CRR, with responses provided by the Environmental Assessment Practitioner (EAP) and/or the project team/specialists as required. Where comments identify substantive issues, the report and/or mitigation measures will be updated accordingly.
- **Submission to the competent authority:** The final Amendment Assessment Report will be submitted together with the final I&AP register, proof of notifications, and the CRR (as applicable) as part of the decision-making record.
- **Ongoing engagement:** I&APs will be kept informed of the competent authority's decision and the appeal process (where applicable), and the I&AP register will remain available for continued communication during implementation, if required.

8 ENVIRONMENTAL MANAGEMENT PROGRAMME

The approved Environmental Management Programme remains applicable to the proposed amendment. Minor updates will be incorporated to align construction sequencing, erosion control and rehabilitation measures with the culvert bridge design. These updates do not alter the intent or effectiveness of the existing mitigation measures, but rather refine their application to suit the amended design.

9 AUTHORISATION FROM OTHER ORGANS OF STATE

An amendment to the existing Water Use Licence is being pursued separately in terms of the National Water Act, 1998, to address the change in watercourse crossing structure. All conditions associated with such authorisation will be complied with during construction and operation.

10 CONCLUSION AND RECOMMENDATION

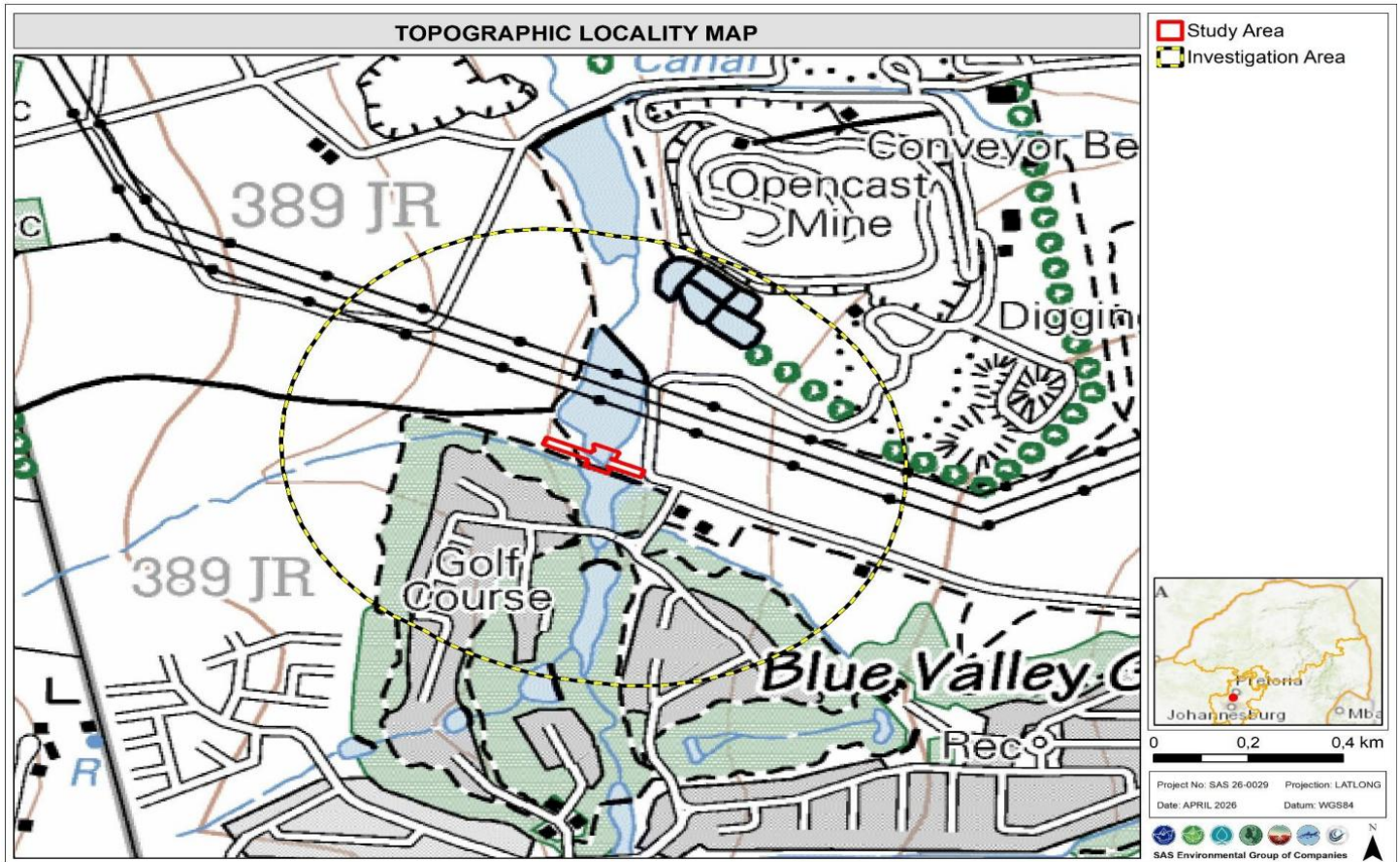
The assessment undertaken has demonstrated that the proposed replacement of the authorised span bridge with a culvert bridge constitutes a technical design refinement rather than a substantive change to the authorised activity. The amendment does not increase the nature, extent or significance of environmental impacts, does not introduce new risks, and remains within the scope of the existing Environmental Authorisation.

It is therefore recommended that the competent authority approve the partial amendment of Environmental Authorisation GAUT 002/15-16/E0011 to allow the construction of a culvert bridge in place of the approved span bridge, subject to continued compliance with the approved and amended Environmental Management Programme and the final approved engineering designs.

11 REFERENCES

1. City of Tshwane Metropolitan Municipality (2017). *2018/19 Integrated Development Plan*. City of Tshwane Metropolitan Municipality
2. Department of Agriculture and Rural Development (2014). *Environmental Management Framework Report*. Gauteng
3. Nali Sustainability Solutions (2016). *Environmental Impact Assessment Report: Kosmosdal Extension 92 Township*

Annexure 1: Locality Map

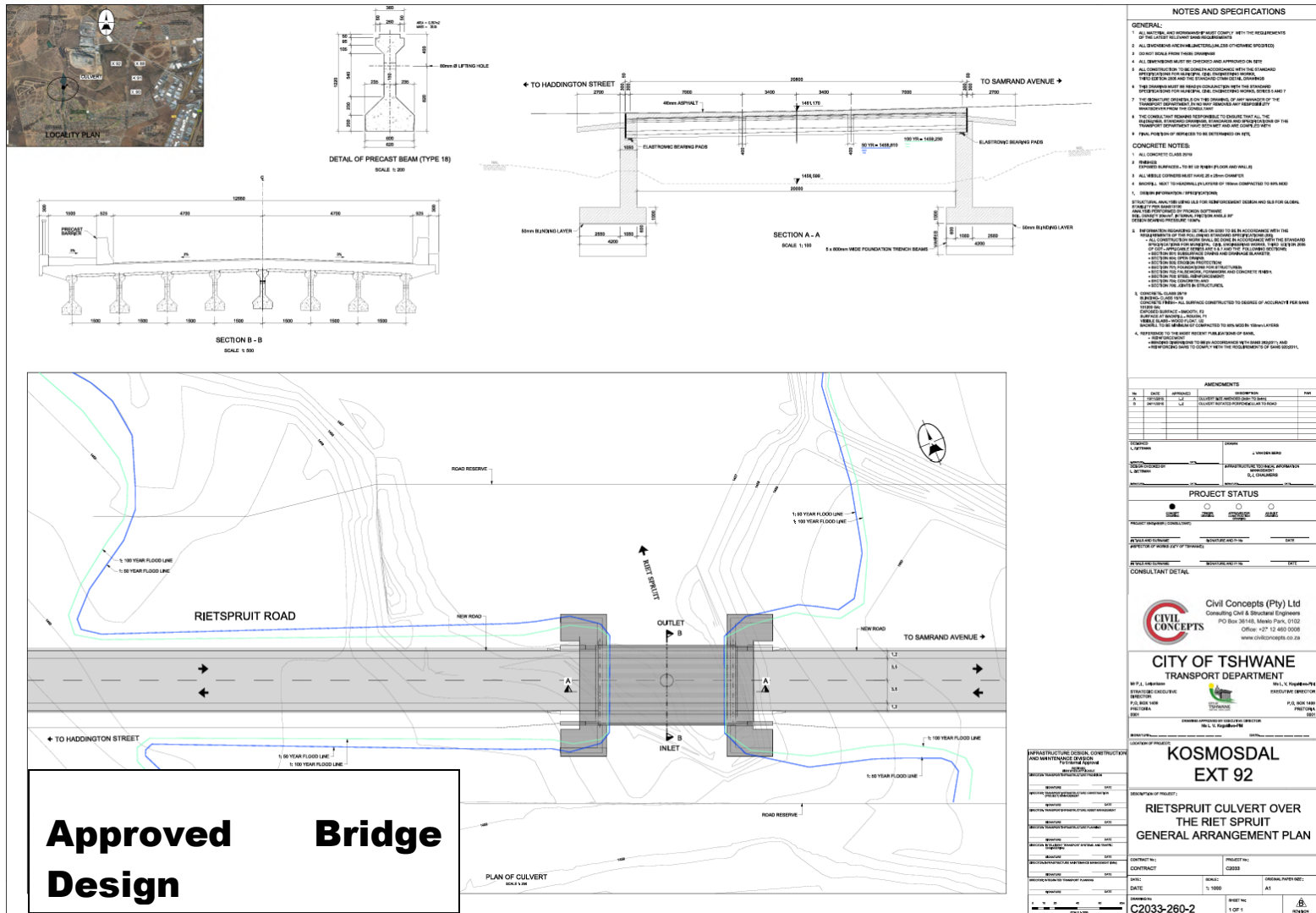


Annexure 2: Layout Plans

- Township Layout Plan
- Approved Bridge Layout Plan
- Proposed Bridge Layout Plan

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Annexure 3: Wetland Assessment Report

Annexure 4: Floodline Report

Annexure 5: Construction Method Statement

Annexure 6: Landscaping Plan

Annexure 7: Public Participation Information

Will be included in the FBAR

- Issues and Response Report
- Newspaper advert
- Site notices
- Notification of government department, municipality, councillor and HOAs
- Proof of receipt of notice
- Communication/email exchange with I&AP
- Register of I&AP

Issues and Response Report

Will be included in the FBAR

Newspaper advert

Will be included in the FBAR

Site notices

Notification of government departments, municipality, councillor and HOAs

Letter of notification - Land owners and occupiers

Proof of receipt of notice

Letter of objection received

Will be included in the FBAR

Email exchange with I & AP

Will be included in the FBAR

Register of Interested & Affected Parties

Will be included in the FBAR

Annexure 8: EMPr
