BASIC ASSESSMENT REPORT FOR THE PROPOSED REHABILITATION OF THE DISTILLERY ROAD BRIDGE, STELLENBOSCH

Prepared for: AECOM SA (Pty) Ltd on behalf of the Stellenbosch Municipality

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EXECUTIVE SUMMARY

1. INTRODUCTION

The Stellenbosch Municipality is proposing to rehabilitate the existing bridge on Distillery Road in Stellenbosch (the proposed project). The bridge crosses the Plankenbrug River and is located on the western edge of Stellenbosch, near the point where Adam Tas Road/R310 crosses the railway line (see Figure 1). Die Boord and Devon Park residential areas lay approximately 300 m south and 700 west of the bridge, respectively. The Distillery Road Bridge is approximately 20 m in length and consists of a single carriageway. It is the only access road into Bosman's Crossing, a small mixed development area within Stellenbosch comprising of various commercial developments and apartment complexes.

The Stellenbosch Municipality appointed AECOM SA (Pty) Ltd (AECOM) (under Contract B/SM 39/18) to investigate and undertake the necessary structural engineering services to address various issues associated with the bridge, such as the severely deteriorated bridge cantilevers; the lack of pedestrian/non-motorised traffic; the downgraded single lane; and the alignment of the road width to minimum required standards.

SLR Consulting (South Africa) (Pty) Ltd (SLR) has been appointed by AECOM as the independent Environmental Assessment Practitioner (EAP) to undertake the Basic Assessment (BA) process for the proposed project. The BA process has been undertaken in terms of the relevant requirements of the Environmental Impact Assessment (EIA) Regulations, 2014 (Government Notice (GN) No. R982, as amended by GN No. 326) promulgated in terms of the National Environmental Management Act, 1998 (No. 107 of 1998), as amended (NEMA).

This Executive Summary provides a synopsis of the draft Basic Assessment Report (BAR) prepared for the proposed project. The draft BAR has been compiled to identify and assess the potential environmental impacts and risks of the proposed project and as a basis to inform Interested and Affected Parties (I&APs) of the proposed project and to obtain their comment.

2. OPPORTUNITY TO COMMENT

This draft version of the BAR has been distributed for a 30-day public review and comment period from 13 November to 14 December 2020 in order to provide I&APs the opportunity to comment on the proposed project. Copies of the report were made available on the SLR website (www.slrconsulting.com). Any comments should be forwarded to SLR at the address, telephone or e-mail address shown below. For comments to be included in the final BAR, comments should reach SLR **by no later than 14 December 2020.**

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After the conclusion of the comment period, all comments received will be collated into a Comments and Responses Report. The comments will be duly taken into account in updating the draft BAR into the final BAR, which will be submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) for consideration and decision-making.

After DEA&DP has reached a decision, all registered I&APs will be notified of the outcome of the application and the reasons for the decision. A statutory appeal period in terms of the National Appeal Regulations, 2014 will follow the issuing of the decision.

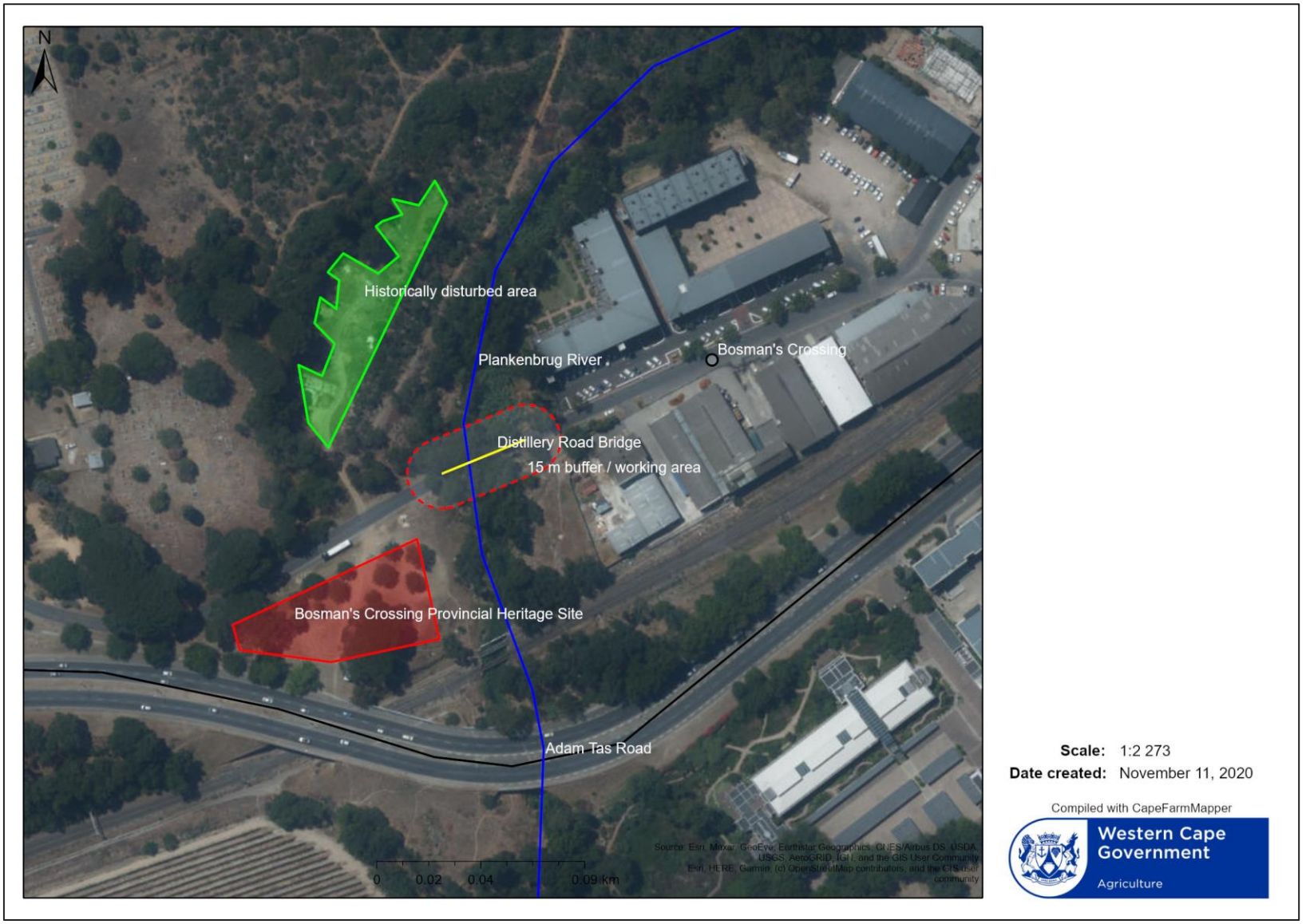

FIGURE 1: LOCALITY MAP (SOURCE: GOOGLE EARTH, 2020)

3. AUTHORISATION REQUIREMENTS

A BA is required in terms of the EIA Regulations, 2014 (as amended) as the proposed project would trigger the following listed activity:

Listing Notice 1 - GN No. R983 of 2014		Project Description
19	*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;…*	The proposed project would result in the depositing and/or excavating and removal of more than 10 m^3 of material from a watercourse (Plankenbrug River) related to the demolition of the damaged bridge structure and construction of a new bridge.

Registration of water uses in terms of the National Water Act, 1998 (No. 36 of 1998; NWA) is also required as the proposed project entails the construction of a bridge over the Plankenbrug River. This process is being undertaken in parallel to the BA process.

Section 38 of the National Heritage Resources Act, 1998 (No 25 of 1998; NHRA) required a Notice of Intent to Develop (NID) form to be submitted to Heritage Western Cape (HWC) for comment. In their consideration of the NID, submitted on 24 June 2020, HWC confirmed that no further heritage impact assessment is required to be undertaken. Separate Section 34 and Section 35 permit processes are, however, required as the bridge is older than 60 years and in order to address how potential impacts are to be avoided in the vicinity of Bosman's Crossing Provincial Heritage Site. These applications will be undertaken separately and in parallel to the BA process with HWC as the competent authority.

4. PROPOSED PROJECT

The motivation for the proposed project relates to the following issues:

- The concrete bridge structure is generally in a structurally poor condition with general evidence of cracking and spalling, mainly the concrete cantilevers of the bridge deck which are in a severely deteriorated state and the reinforcement is badly corroded, thereby compromising its structural integrity;
- All other elements of the bridge are also in a relatively poor condition and the substructure seems to consist of remnants of an earlier bridge structure;
- The bridge has been downgraded to a single lane (one direction at a time with a stop-go system) to minimise loading on the cantilevers, thereby impeding traffic flow on the road during peak hours;
- The current road width is 5.6 m, which is below the required minimum standard of 6 m; and
- No allowance is made for non-motorised and pedestrian access over the bridge which represents an additional safety hazard.

The proposed project entails the following:

- Phased demolition of the current bridge structure to allow traffic accommodation during the rehabilitation of the facility;
- Excavation within the riverbed and banks to construct foundations of new bridge supports, including piling;
- Construction of a new bridge super and substructure which is approximately 6 m wider and 7 m longer than the existing bridge; and
- Provision of a wider road surface and sidewalk for the bridge approaches to accommodate two lanes of vehicle and pedestrian / non-motorised traffic in accordance with the planning requirements for this urban area.

The proposed design entails the demolition of the existing deck. It would comprise of a single 20 m deck span with the retention of the existing pier (non-functional), with piled abutments which would span the existing substructure. The proposed design has been duly informed by the heritage significance of the structure and from input received from a

heritage practitioner and architect with previous experience in the restoration of bridges with historical value. The proposed bridge design and bridge cross-section are provided in Figures 2 and 3, respectively.

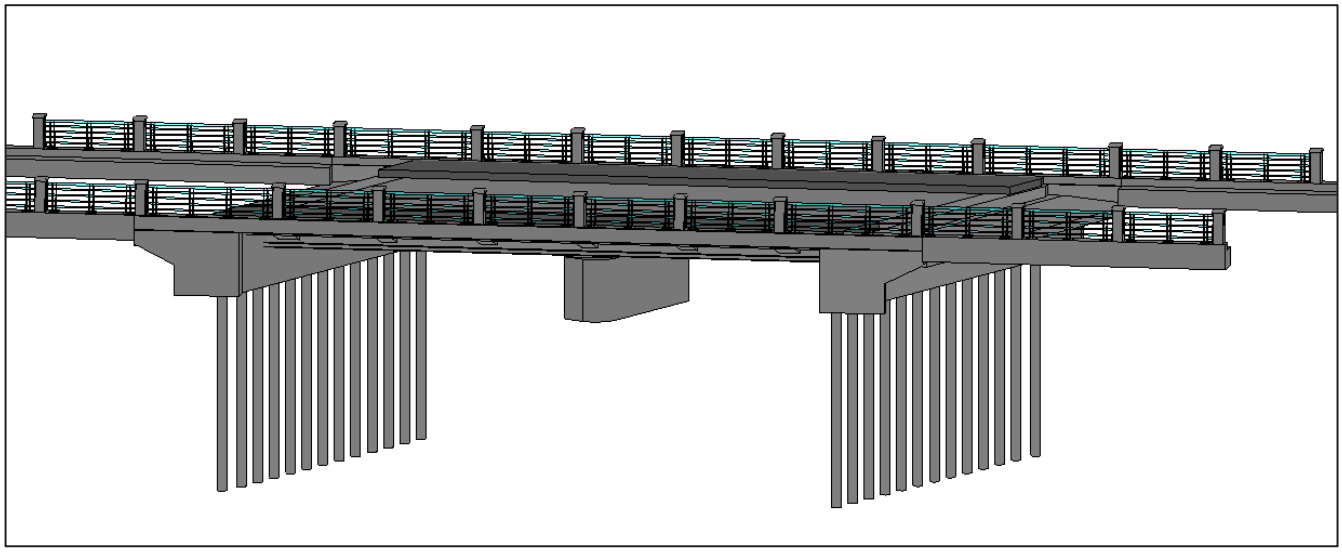

FIGURE 2: PROPOSED BRIDGE DESIGN (SINGLE 20 M DECK SPAN WITH PILED ABUTMENTS AND RETENTION OF EXISTING PIER (NON-FUNCTIONAL)).

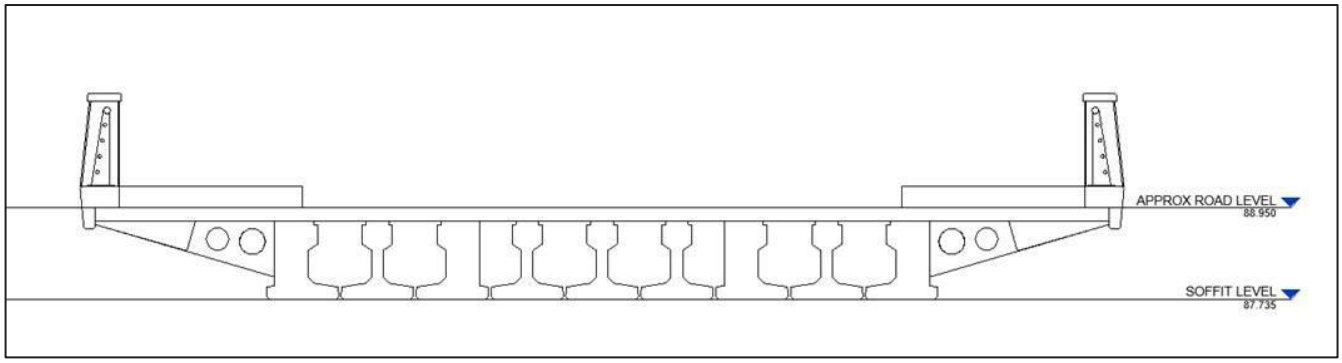

FIGURE 3: PROPOSED BRIDGE CROSS-SECTION.

5. AFFECTED ENVIRONMENT

The topography is relatively flat. The project site is located on an aquifer that is classified as a major aquifer of most vulnerability and high susceptibility. Overall water table level is subject to seasonal fluctuations. The average groundwater depth is estimated at approximately 7 m below ground level; however, a geotechnical investigation undertaken on 26 June 2020 recorded groundwater depth to be approximately 3 m below ground level. These levels were recorded just as the rainy, winter season commenced.

The project area is located within the Southwestern Coast Belt Ecoregion, Berg Water Management Area and the G22H quaternary catchment. The Plankenbrug River and its tributaries drain the area from Simonsberg to the ridge near the Devonvale Golf Estate. It also drains the residential areas of Cloetesville, Kayamandi and much of Stellenbosch town, before flowing under the Distillery and Adam Tas Road bridges, to join the Eerste River. The catchment is dominated by a mixture of agriculture (predominantly vineyards) and urban land uses.

The Western Cape Biodiversity Spatial Plan (WCBSP) indicates the Plankenbrug River and riparian zone as a Critical Biodiversity Area (CBA) 1 watercourse. It also indicates two CBA 1 wetland areas on the west of the Plankenbrug River within the project area approximately 50 m upstream, and immediately downstream of the bridge. Two further wetlands are

indicated within 500 m of the bridge – one immediately downstream of the Adam Tas Bridge and the other approximately 130 m upstream of the confluence with the Plankenbrug River. A CBA 1 terrestrial habitat and an Ecological Support Area (ESA) 2 are indicated to the west and east of the river, respectively. The vegetation type in the surrounding area is mapped as Swartland Granite Renosterveld, which is rated as Critically Endangered. However, no vegetation that corresponds to the Critically Endangered terrestrial vegetation type was noted on site and given the degree of past disturbance, infilling and compaction, the indigenous terrestrial vegetation is deemed to be entirely lost, to the extent of the seed bank as well.

The Plankenbrug River lacks true instream vegetation. Hydrophytic vegetation within and immediately adjacent to the flowing stream channel was dominated by alien invasive species such as *Commelina bengalensis*, *Arundo donax,* and *Persicaria lapathifolia,* but with tolerant indigenous species such as *Cyperus dives, Cyperus textilis*, and *Isolepis prolifera* present in places. Downstream of the bridge, *Acacia saligna* and *Ricinus communis* are also present.

Upstream of the bridge on the west bank, the riparian zone includes a mixture of alien and indigenous trees. The understorey in this area is dominated by the alien invasive *Tropaeolum majus* and *Pennisetum clandestinum*, with a single patch of indigenous *Chasmanthus aethiopica* noted. The canopy was dominated by the indigenous *Olea europaea ssp. africana* and the alien *Populus candescens*, with occasional *Eucalyptus cameldensus* towards the terrestrial extreme of the riparian zone. The top of the east bank upstream and both banks downstream of the bridge is levelled and compacted with sparse terrestrial pioneer vegetation dominated by *Cynodon dactylon* and *Pennisetum clandestinum* grasses. Occasional *Quercus palustris* are also present scattered within the disturbed terrestrial area downstream of the bridge on the west bank.

Two indigenous fish species, namely the *Galaxius zebratus* and *Sandelia capensis* are known to inhabit the Eertse River catchment. Both species may therefore be present within the project area, but given their hardy nature, neither are expected to be impacted significantly by the proposed project. Several alien invasive fish species are known to inhabit the catchment such as the *Onchorynchus mykiss*, *Pseudocrenilabrus philander*, *Cyprinus carpio* and *Clarius capensis*. The alien invasive freshwater shrimp *Caridina africana* has also recently established itself in the Eerste River catchment.

Archaeological resources in the form of Early Stone Age implements were discovered adjacent to the Distillery Road Bridge during previous surveys. The artefacts are dated to the earlier part of the Middle Pleistocene, between 700 00 and 300 000 years ago. A large sandstone boulder marks the location of Bosman's Crossing Provincial Heritage Site which was declared a National Monument in 1962 as the location of where the Early Stone Age implements were found. This Site has substantial significance for the origins of archaeological research in South Africa as well as knowledge about the Early Stone Age.

The bridge is also known as Bosman's Crossing and up until the 1960s, was the main entrance into Stellenbosch from Cape Town. The bridge, as far as can be ascertained, is also known as the "Steenenbrug". It is believed to be the first public works project undertaken in the area in 1691.

Additionally, the Distillery Road Bridge is located within the 'Papegaaiberg Landscape Unit' which is considered to be a significant cultural area. The suburb at the foot of Papegaaiberg is called Onder Papegaaiberg and most of the open space is marked with large stone pines which also incorporate the Onder Papegaaiberg cemetery on the foot slopes.

The closest residential suburbs to the proposed project are Die Boord and Devon Park which lay approximately 300 m south and 700 m west of the bridge, respectively.

6. ENVIRONMENTAL IMPACT STATEMENT

The majority of the impacts are expected to be of **INSIGNIFICANT** to **LOW** significance after mitigation. Socio-economic benefits related to potential temporary employment opportunities are rated as of ***VERY LOW (POSITIVE)*** significance during the construction phase. Long term socio-economic benefits related to improved road safety, traffic alleviation and provision of non-motorised facilities/pedestrian walkway are rated as of ***HIGH (POSITIVE)*** significance post-construction. Traffic impacts during the construction phase are deemed to be of a **LOW** significance after mitigation.

Construction activities would result in a localised increase in dust, noise levels and visual impacts which may be a nuisance to local residents. Given the short duration and extent of the construction phase, this impact is deemed to be of **VERY LOW** significance after mitigation. Surface and groundwater impacts during the construction phase are deemed of **VERY LOW** significance pre and post mitigation, respectively.

Given the largely modified state of the Plankenbrug River and the dominance of alien invasive species within the project area, impacts related to aquatic ecosystems are deemed to be of Very Low (habitat loss) to Low (biota loss) significance before mitigation and of **VERY LOW** significance after mitigation. Impacts related to sedimentation/erosion in the riparian zone and temporary flow diversion is deemed to be **INSIGNIFICANT** to **VERY LOW** significance**.**

During the maintenance phase, aquatic ecosystems may be impacted negatively through the spread of alien vegetation and disturbance/damage to aquatic species. With the implementation of the recommended mitigation measures, the residual impacts are deemed to be of **VERY LOW** significance**.**

The No-Go alternative would not be beneficial to society in any way and would mean that the bridge would continue to deteriorate, thereby compromising road user safety and access. Additionally, the short-term employment benefits would not be realised. The No-Go alternative is rated as having a **HIGH** negative significance.

A summary of the significance of the positive and negative impacts/risks identified for the proposed project is provided below:

TABLE 1: CONSTRUCTION-RELATED IMPACTS/RISKS.

Impact/Risk	Significance without mitigation	Significance with mitigation
Nuisance aspects (air quality, noise and visual)	Low	**VERY LOW**
Socio-Economic aspects (employment opportunities, etc.)	*Very Low (positive)*	***VERY LOW (POSITIVE)***
Traffic disruption	Low	**LOW**
Surface and Groundwater contamination	Very Low	**VERY LOW**
Deterioration of Freshwater Ecosystems and riparian vegetation	Very Low to Low	**VERY LOW**
Compaction of sediment/erosion in riparian zone	Very Low	**VERY LOW**
Flow diversion	Very Low	**INSIGNIFICANT**

TABLE 2: MAINTENANCE-RELATED IMPACTS/RISKS.

Impact/Risk	Significance without mitigation	Significance with mitigation
Deterioration of Freshwater Ecosystems (ongoing maintenance activities)	Low	**LOW**
Socio-Economic (improved safety, access and facilities)	*High (positive)*	***HIGH (POSITIVE)***

TABLE 3: IMPACTS ASSOCIATED WITH THE NO-GO OPTION.

Impact/Risk	Significance without mitigation	Significance with mitigation
No-Go Alternative	High	**HIGH**

7. RECOMMENDATIONS

Table 4 below includes a list of the recommended mitigation / enhancement measures to reduce / optimise the identified impacts / risks:

TABLE 4: RECOMMENDED MITIGATION ENHANCEMENT MEASURES.

Impact / Risk	Mitigation / enhancement measure
Nuisance aspects (air quality, noise and visual) – construction phase	• The Contractor shall be familiar with and adhere to, any local by-laws and regulations regarding the generation of noise and hours of operation. In addition, the provisions of SANS 10103 regarding the generation of noise shall apply to all areas within audible distance of residents. • The Contractor shall endeavour to keep noise-generating activities to a minimum, particularly during night-time work. • Implement a procedure for recording and managing external grievances/complaints. Actions shall be identified as required. • No high noise-generating activity outside of normal hours, regardless of its proximity to residences, shall take place without application to the Resident Engineer (RE) for approval. The application must include proposed noise containment measures. High noise-generating activities include pile driving, grinding, road material loading/unloading, hammering, excavating, etc. • The Contractor shall restrict all operations that result in high noise disturbance to local communities to daylight working hours on weekdays or as otherwise agreed with the RE and local authority. • Ensure vehicles and equipment are adequately maintained and in good working order. • The Contractor shall ensure that the generation of dust is minimised and shall implement a dust control programme (with due consideration to conserving water) to maintain a safe working environment, minimise nuisance for surrounding residents and businesses and prevent damage to natural vegetation. • Provide appropriate measures for visual screening (e.g. at construction yards, batching plants, laydown areas, etc.).
Socio-Economic - construction phase	• As far as possible, employ local Broad-Based Black Economic Empowerment (B-BBEE) services and providers and local labour from the local community. • Ensure that, where required, appropriate training of personnel is provided.
Traffic disruption - construction phase	• The Contractor shall appoint suitably trained traffic safety officers who shall be responsible for ensuring that construction activities do not obstruct traffic and that adequate traffic accommodation measures are put in place. • The Contractor shall also ensure that adequate pedestrian traffic accommodation, signage and safety measures (as appropriate) are put in place on site. • All construction vehicles shall comply with speed limits. • Movement of heavy vehicles shall be limited to daylight hours, as far as possible.
Surface and Groundwater contamination - construction phase	• As far as possible, no stockpiling of materials shall be undertaken within 30 m of the Plankenbrug River, unless within the area historically disturbed and used during the replacement of the pipeline upstream of the bridge. • The construction camp shall not be established within 30 m of the Plankenbrug River, unless within the area historically disturbed and used during the replacement of the pipeline upstream of the bridge. • The Contractor shall prepare and implement a Method Statement for the containment, handling, storage and disposal of hazardous substances. • The Contractor shall prepare and implement a Method Statement detailing the procedure for dealing with accidental leaks and spills and shall ensure that its employees are aware of the procedures to be followed. • All fuel, oil and other hazardous substances shall be confined to demarcated, adequately bunded areas within the construction camp and stored in suitable containers/storage facilities. • Suitable warning signs indicating the nature of the stored materials shall be displayed at the storage facility. • Drip trays or similar forms of secondary containment shall be provided for stationary plant (such as compressors, pumps, generators, etc.) and for "parked" plant (e.g. excavators, hauling trucks, etc.). • Where reasonably practical, plant and vehicles shall only be refuelled in a demarcated refuelling/servicing area using suitable equipment (e.g. pumps, funnels, etc. • The surface under the refuelling area shall be protected against pollution (e.g. the use of drip trays, concrete sump, etc.). • The Contractor shall ensure that a suitable hydrocarbon spill clean-up kits are readily available at refuelling areas. • All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or moved to a suitable contained area. • When servicing equipment, drip trays shall be used during the collection of waste oil and other hazardous substances (e.g. coolants, fuel, grease, etc.).

Impact / Risk	Mitigation / enhancement measure
	• Cement and concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces. • Unused (full) cement bags shall be stored undercover and away from surface runoff. • Used (empty) cement bags shall be collected and stored in weatherproof containers. • All excess concrete shall be removed from site on completion of concrete works and disposed of. • Washing of the excess cement/concrete into the ground shall not be allowed.
Deterioration of Freshwater Ecosystems - construction phase	• Revegetate disturbed portions of the riparian zone within the construction footprint. This will increase the quality and availability of riparian habitat overall. Use the following locally indigenous plants species for revegetation: o *Cyperus textilis* (marginal) o *Pteridium aquilinum* (marginal) o *Cliffortia strobilifera* (marginal) o *Olea europaea ssp. africana* (riparian) • Stockpile materials only within the area historically disturbed and used during the replacement of the pipeline upstream of the bridge. • Determine the minimum construction area required within the riparian zone and stream channel for vehicular access. Demarcate this area with danger tape or a similar material and do not allow vehicular access to the stream channel or riparian zone outside of this demarcated area. • Where possible, work from the downstream side of the bridge using either or both banks for access as this area has been recently disturbed and is least sensitive. • If it is essential to access the area upstream of the bridge with vehicles, do so via the east bank and avoid entering the riparian area on the west bank with vehicles as far as possible. • If it is essential to access the west bank of the river avoid removing indigenous trees within the riparian area (only applicable to the west bank upstream of the bridge). • Avoid stream flow diversion, if possible, by undertaking work in the stream channel during summer, or return flow as soon as possible to the affected area to minimise the duration of the stream flow diversion. • The Contractor shall be responsible for informing all employees about the need to prevent any harmful effects on natural vegetation on or around the construction site as a result of their activities. • The use of herbicides and pesticides is prohibited unless approved by the RE. • Ensure that, where required, appropriate training in the removal of alien vegetation is provided. • Where dewatering of excavations is required, no water is to be pumped directly into the river. Implement a sediment pond/sump system in order to prevent sedimentation of the river from dewatering activities.
Compaction of sediment/erosion in riparian zone – construction phase	• Demarcate project area with danger tape or a similar material and do not allow vehicular access to the stream channel or riparian zone outside of this demarcated area. • Revegetate disturbed portions of the riparian zone within the construction footprint as per the above-mentioned recommendations in this regard. • As far as possible, undertake work within the stream channel and banks during the summer months (November to March) to minimise the risk of erosion of the disturbed and compacted sediments during a rain event. • Compacted ground shall be rehabilitated by ripping to a minimum depth of 600 mm. Topsoil of at least 20 cm should be placed on top of the ripped soil.
Flow diversion – construction phase	• If possible, undertake work within the stream channel during mid to late summer (November to March) to ensure that minimal flows are present at the time. • Only divert flow if operationally necessary. Divert flow over as short a length of river as possible, but no more than 25 m. • Return flow to the original channel as soon as possible after completion.
Deterioration of Freshwater Ecosystems – maintenance phase	• Minimise the spatial extent of disturbance. • Minimise the frequency of (or requirement for) maintenance activities. • Do not impede the movement of aquatic and riparian biota. • Minimise alterations to flow- and sediment-capacity. • Rehabilitate and re-vegetate disturbed areas as soon as possible. • Clear alien invasive plant species. • Restrict maintenance activities to the dry season where possible. • Prevent erosion and rehabilitate eroded areas. • Use existing access routes as far as possible.

Impact / Risk	Mitigation / enhancement measure
	• Store and handle all hazardous materials and waste in a suitable manner, and at least 30 m outside of the Plankenbrug River. • Remove excess spoil material and solid waste and ensure it is disposed of at approved waste disposal sites. • Ensure maintenance activities do not lead to channelisation or canalisation of the watercourses. • Remove cleared woody material from the areas adjacent to the watercourse and wetlands to prevent it being washed into the watercourse. • Maintenance activities are to be undertaken in line with the Stellenbosch River Management Plan Update (June 2011)

Additionally, it is recommended that an Environmental Control Officer (ECO) be employed to oversee and monitor compliance with the EMPr for the duration of the construction phase of the project (see Section 3 of the EMPr for further details in this regard).

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