Potential impacts and Impact Assessment

All key environmental concerns associated with this project, as identified by the specialist team and EAP are categorised in terms of their biophysical and socio-economic parameters (please refer to Appendix D for their Specialist Reports). As indicated in Section 2.3 of the BAR, there are no feasible and reasonable site alternatives for the proposed development.

Three activity alternatives as follows, were identified and discussed in Section 2.3:
Activity Alternative 1: Construction in half widths
Activity Alternative 2: Constructing a temporary bypass
Activity Alternative 3: Rerouting of traffic for short periods (preferred alternative)

Activity Alternative 1: Construction in half widths

Activity Alternative 1 involves the development of the Sublime Access road with the implementation of construction of the road in half widths, using Stop Go traffic control to control the traffic. One half of the road will be constructed, while traffic is accommodated on the other half. Once construction has been completed the completed half is opened to traffic and the other half constructed. Only single lane traffic can be accommodated traffic and controlled by Stop Go signage at the end points of the section to be constructed. Waiting queues have to be cleared before opposing traffic are allowed to pass.

The following impacts construction phase impacts are associated with Activity Alternative 1:

- *Destruction of sensitive vegetation and disturbance to fauna and faunal habitat*
- *Increased potential of invasion by alien vegetation*
- *Impact on wetland functioning*
- *Increase in erosion potential*
- *Pollution of watercourse features*
- *pact of disturbance to heritage and archaeological resources*
- *Disturbance of palaeontological resources*
- *Impact of noise on surrounding land owners*
- *Impact of change of visual character of the site*
- *Impact of traffic congestion on surrounding road network*
- *Employment creation and skills transfer as a result of opportunities for local people*
- *Impact of environmental pollution (noise, air, dust etc.) on the health of construction workers*

The following operational phase impacts are associated with Activity Alternative 1:

- *Disturbance to fauna*
- *Pollution of downstream watercourses*

Please refer below for the detailed Impact Assessment associated with Activity Alternative 1.

Pre-Construction Phase

The impacts anticipated for the Pre-construction Phase will be minimal and negligible. The site set up and demarcations for the site will be done in conjunction with the appointed independent Environmental Control Officer (ECO) who will undertake scheduled compliance audits to ensure that the activities forming part of this phase are in line with the Environmental Management Programme and environmental safe guarding ideals associated with this project.

Prior to the construction phase, preference should be given to sourcing local skilled and unskilled labour. Recruitment of labour should be guided by both Eskom's recruitment policies which should promote the employment of local labour by any appointed contractors.

Construction Phase

a) Destruction of sensitive vegetation and disturbance to fauna and faunal habitat

During construction, especially in areas where culverts will be installed, vegetation and faunal habitat may be destroyed and/or disturbed. The vegetation that may be impacted on includes moist grassland/wetland habitat, which is considered to have a high ecological importance.

Table 1: Impact ratings for Destruction of Sensitive Vegetation and disturbance to fauna and faunal habitat

DESTRUCTION OF SENSITIVE VEGETATION AND DISTURBANCE OF FLORAL AND FAUNAL HABITATS				
PROJECT PHASE	*Construction phase*			
DIRECT IMPACT	*Destruction of sensitive vegetation and disturbance of floral and faunal habitats due to the road upgrade activities, installation of drains and culverts*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***low - negative***		
PROPOSED MITIGATION MEASURES				
• *An independent ECO must be appointed to oversee construction activities* • *The removal of indigenous vegetation must be limited. The ECO must develop a document indicating the spatial representation of indigenous vegetation within the study area* • *Construction activities must remain within the footprint of the road reserve* • *Following construction, all remaining areas that have been cleared of vegetation must be rehabilitated with appropriate indigenous plant species found in the area. A site specific rehabilitation plan must be compiled by a suitable qualified ecologist (including indigenous plant species list) and implemented by a suitably qualified rehabilitation specialist. The ecologist must develop the vegetation species list as well as identify the areas constituting indigenous vegetation where removal should be limited* • *If possible, construction should commence in the dry winter months to avoid disturbance to breeding fauna as well as erosion as a result of vegetation removal combined with rainfall events* • *No wild animal (including birds) may under any circumstance be handled, removed or be interfered with by construction workers* • *No wild animal may under any circumstance be hunted, snared, captured, injured or killed. Regular checks of the surrounding natural areas for snares and traps must be undertaken by the appointed ECO* • *No wild animal may be fed on site and all food stuffs must be contained and not left unattended so that fauna are not attracted to the site during the construction phase* • *Refuse must be disposed of in an appropriate manner so that vermin is not attracted to the site*				

POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-5**	**Very low negative**		
CONFIDENCE LEVEL				
Medium				

b) Increased potential of invasion by alien vegetation

During construction, disturbance to the soil and indigenous vegetation will increase the likelihood of invasion by alien plant species. Alien species establish easily and quickly on bare soil by colonisation or from seeds existing in the seed bank of the soil. Infestation by alien and invasive species will lead to degradation of the surrounding natural habitat and will increase the potential of spread into the greater landscape due to propagules being released into downstream watercourses.

Table 2: Impact ratings for increased potential of invasion by alien vegetation

INCREASED POTENTIAL OF INVASION BY ALIEN VEGETATION				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increased potential of invasion by alien vegetation due to the removal of vegetation cover during the construction activities*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		

SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEABLE RESOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***low - negative***		
PROPOSED MITIGATION MEASURES				
The removal of indigenous vegetation must be limited *Following construction, all remaining areas that have been cleared of vegetation must be rehabilitated with appropriate indigenous plant species found in the area. A site specific rehabilitation plan must be compiled by a suitable qualified ecologist and implemented by a suitably qualified rehabilitation specialist* *An alien invasive species removal and management plan must be compiled by a suitably qualified ecologist* *All alien seedlings and saplings must be removed as they become evident for the duration of construction. Unless chemical control is necessary, manual or mechanical removal is preferred to chemical control. These seedlings and saplings will then need to be disposed of in a manner which will prevent further spread of these alien vegetation* *All construction vehicles and equipment, as well as construction material must be free of plant (vegetation) material. Equipment and vehicles must be thoroughly cleaned prior to gaining access to the construction site* *Construction activities must remain within the footprint of the road reserve. Construction camps must remain outside of wetland areas*				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEABLE RESOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-5**	**very low negative**		
CONFIDENCE LEVEL				
High				

c) Impact on wetland functioning

During construction, there could be negative impacts on the wetland functioning of affected valley bottom wetlands such as decreased surface roughness, increase in run off, decrease in infiltration, soil and alien invasive dispersal, caused by vegetation clearance in the wetland area.

Table 3: Impact ratings for decreased wetland functioning

IMPACT ON WETLAND FUNCTIONING				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Decreased wetland functioning (decreased surface roughness, increase in run off, decrease in infiltration, soil and alien invasive dispersal), caused by vegetation clearance in the wetland*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***Low - negative***		
PROPOSED MITIGATION MEASURES				
An independent ECO must be appointed to oversee construction *The removal of indigenous vegetation must be limited* *Construction activities must remain within the footprint of the road reserve* *Following construction, all remaining areas that have been cleared of vegetation must be rehabilitated with appropriate indigenous plant species found in the area* *A site specific rehabilitation plan must be compiled by a suitable qualified ecologist and implemented by a suitably qualified rehabilitation specialist* *An alien invasive species removal and management plan must be compiled by a suitably qualified ecologist* *All alien seedlings and saplings must be removed as they become evident for the duration of construction. These seedlings and saplings will then need to be disposed of in a manner which will prevent further spread of these alien vegetation* *Unless chemical control is necessary, manual or mechanical removal is preferred to chemical control* *All construction vehicles and equipment, as well as construction material must be free of plant (vegetation) material. Equipment and vehicles must be thoroughly cleaned prior to gaining access to the construction site.* *In cases where natural vegetation were cleared/removed due to the movement of people or stockpiling of building materials, re-vegetation should take place. Prior to re-vegetation efforts taking place in cleared and degraded wetlands, it is imperative that all solid wastes are removed from individual HGM units and their immediate surrounding regions. Post solid waste removal, a mixture of indigenous species should be introduced (Peters et al., 2012). The re-establishment of vegetation will increase these systems' ability to maintain biodiversity, the reduction in velocity and quantity of runoff waters into wetlands, the slowing down of water movement through a wetland thus aiding in trapping sediment and improving the overall quality of water (Mullins, 2012)*				

POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-5**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

d) Increase in erosion potential

During construction, exposed soil will be susceptible to erosion especially if indigenous vegetation is cleared. The negative impacts for construction within the wetland may lead to increase in erosion potential, compaction of soil, impeding the flow of water through a watercourse and siltation, caused by construction activities such as storage of material, movement of people/ machinery through the site, filling in and clearing of land.

Table 4: Impact ratings for increase in erosion potential

INCREASE IN EROSION POTENTIAL				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increase in erosion potential, compaction of soil, impeding the flow of water through a watercourse and siltation, caused by construction activities such as storage of material, movement of people/ machinery through the site, filling in and clearing of land*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*--10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		

SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***low - negative***		
PROPOSED MITIGATION MEASURES				
It is recommended by the Wetland Ecologist, that a General Authorization be applied for from the DWS for the water uses associated with the project. It is envisaged that the development activities will constitute a low risk to the watercourse feature health. As such, the registration forms will be submitted to the DWS for the Section 21(c) and 21(i) watercourses. *The removal of vegetation must be limited as far as possible* *Following construction, all remaining areas that have been cleared of vegetation must be rehabilitated with appropriate indigenous plant species found in the area. Grass species are recommended to limit erosion potential* *Steep slopes must be stabilised using the most appropriate and approved method and technology* *Undertake construction activities during the winter months and / or outside the rainy season as far as practicably possible* *Formalised stormwater channels and drains fitted with silt traps must be included in the road design* *Storm water management reduces the negative effects of storm water runoff. Management of storm water comprises of controlling flooding, reducing erosion and improving water quality. This can be achieved by implementing measures known as Best Management Practices (BMPs)* *In addition, there are vegetative BMPs which include a number of landscaping practices. Grassed swales, or ditches, can be placed in residential areas or in highway medians. This BMP helps lessen the peak runoff downstream through processes of infiltration and storage. Filter strips are designed to direct storm water from impervious areas into a stone trench, which evenly distributes the runoff over a grass strip. Particular attention should be given to HGM units 3 and 4 when considering storm water management infrastructure, as these HGM units run in close proximity to the road which could cause an accumulation of water, and consequential flooding of the road if proper storm water management systems are not implemented*			
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-10**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

e) Pollution of watercourse features

During construction and operation, stormwater runoff will carry pollution from the road to the surrounding natural areas. This may result in the contamination of the wetland areas (impacting on sensitive vegetation and faunal habitat) as well as watercourses further downstream.

Table 5: Impact ratings for increased pollution of watercourses

INCREASED POLLUTION OF WATERCOURSE RESOURCES				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increase in pollution of watercourse features and impact on sensitive vegetation and faunal habitat, caused by contaminated stormwater runoff entering into the watercourses and littering during construction and maintenance.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Formalised stormwater channels, culverts and drains fitted with silt traps must be included in the road design *Polluting sources from the road must be prevented from entering the surrounding wetlands and other natural areas.* *Stormwater channels must be designed carefully and all drains must be fitted with stilt and any other appropriate pollution traps* *Silt and litter traps must be checked and cleared regularly* *Litter thrown from trucks must be prohibited* *Oil or fuel spills must be avoided with regular vehicle and mechanical checks. Any spills must be attended to immediately and cleaned by means of the spillage clean-up procedure.* *During periods of construction there should be minimal human disturbances by minimizing activities that would lead to excessive pollution and run off into the drainage line (Kotze et al., 2008). During the construction phase all measures should be taken in order to prevent contamination of wetland areas by vehicles utilised. If any spills of diesel, petrol, oil, or corrosive fluid occur a spill kit should be kept on site to immediately address this. All vehicles*				

and machinery should therefore be kept off site in a bunded, platformed location in order to avoid such contamination in the watercourses *During construction periods, vehicles should only be allowed to stand overnight and be refueled on impervious surfaces only* *All materials stockpiled outside the buffer area should strictly be kept 30 m away from the watercourses on site.*				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-5**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

f) Impact of disturbance to heritage and archaeological resources

The potential negative impacts on the affected landscape are activities related to excavations, and movement of construction equipment along the proposed road servitude. However, because the existing route is already significantly impacted on, the potential impacts are insignificant. However, sub-surface materials may still be lying hidden from surface surveys and may become uncovered during construction.

Table 6: Impact ratings for presence of heritage and archaeological resources

IMPACT ON HERITAGE AND ARCHAEOLOGICAL RESOURCES				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Disturbance to heritage and archaeological resources, caused by the construction activities.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-3*	*2*

EXTENT	*1*	*The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted*		
SIGNIFICANCE	***-6***	***very low negative***		
PROPOSED MITIGATION MEASURES				
The following monitoring and reporting procedures must be followed in the event of a chance find, in order to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all construction teams must be properly inducted to ensure they are fully aware of the procedures regarding chance finds. • *The chance finds process will be implemented when necessary especially when archaeological materials and burials are encountered during subsurface construction activities* • *If archaeological materials are uncovered, work should cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place* • *If during the construction or operations phases of this project, any person employed by the developer, any of its subsidiaries, contractors and subcontractors, or service provider, finds any artefacts of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manage* • *The senior-site manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing SAHRA/PHRA* • *If a human grave/burial is encountered, the remains must be left as undisturbed as possible before the local police and SAHRA or PHRA are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency rescue permit may be issued by SAHRA for an archaeologist to exhume the remains*				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-3*	*1*
EXTENT	1	*The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted*		
SIGNIFICANCE	**-3**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

g) Disturbance of palaeontological resources

No fossils were found in situ during the field survey by the Palaeontologist. There is however a high probability that fossiliferous sandstone could be uncovered in the study area during construction, when the soil and weathered rock are cleared and the bedrock is exposed.

Table 7: Impact ratings for disturbance of palaeontological resources

<table>
<tr><th colspan="5">IMPACT ON PALAEONTOLOGICAL RESOURCES</th></tr>
<tr><td>PROJECT PHASE</td><td colspan="4">Construction Phase</td></tr>
<tr><td>DIRECT IMPACT</td><td colspan="4">Disturbance of paleontological resources, caused by the construction activities.</td></tr>
<tr><td>INDIRECT IMPACT</td><td colspan="4">--</td></tr>
<tr><td>CUMULATIVE IMPACT</td><td colspan="4">--</td></tr>
<tr><th>DIMENSION</th><th>RATING</th><th>MOTIVATION</th><th>CONSEQUENCE</th><th>LIKELIHOOD</th></tr>
<tr><th colspan="5">PRE-MITIGATION</th></tr>
<tr><td>DURATION</td><td>2</td><td>The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term</td><td rowspan="2">-3</td><td rowspan="2">2</td></tr>
<tr><td>EXTENT</td><td>1</td><td>The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur</td></tr>
<tr><td>SEVERITY</td><td>-1</td><td>The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected</td><td rowspan="3">Negligible</td><td rowspan="3">Likely</td></tr>
<tr><td>IMPACT ON IRREPLACEBLE REOURCES</td><td>0</td><td>No irreplaceable resources will be impacted</td></tr>
<tr><td>SIGNIFICANCE</td><td>-6</td><td>very low negative</td></tr>
<tr><th colspan="5">PROPOSED MITIGATION MEASURES</th></tr>
<tr><td colspan="5">The following procedure must be considered in the event that previously unknown fossils or fossil sites are exposed or found during the life of the project:

• Surface excavations should continuously be monitored by the ECO and any fossil material be unearthed the excavation must be halted.
• If fossiliferous material has been disturbed during the excavation process it should be put aside to prevent it from being destroyed.
• The ECO then has to take a GPS reading of the site and take digital pictures of the fossil material and the site from which it came.
• The ECO then should contact a palaeontologist and supply the palaeontologist with the information (locality and pictures) so that the palaeontologist can assess the importance of the find and make recommendations.
• If the palaeontologist is convinced that this is a major find an inspection of the site must be scheduled as soon as possible in order to minimise delays to the development.
• From the photographs and/or the site visit the palaeontologist will make one of the following recommendations:
  ○ The material is of no value so development can proceed, or:</td></tr>
</table>

○ *Fossil material is of some interest and a representative sample should be collected and put aside for further study and to be incorporated into a recognised fossil repository after a permit was obtained from SAHRA for the removal of the fossils, after which the development may proceed, or:* ○ *The fossils are scientifically important and the palaeontologist must obtain a SAHRA permit to excavate the fossils and take them to a recognised fossil repository, after which the development may proceed.* • *If any fossils are found then a schedule of monitoring will be set up between the developer and palaeontologist in case of further discoveries.*				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-3*	*1*
EXTENT	1	*The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-3**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

h) Impact of noise on surrounding land owners

Noise may result from the movement of vehicles, trucks and other associated machinery used during the construction phase. However, the noise associated with construction activities will be of short term nature, localised and will only last during the construction phase of the project.

There will be no increase in ambient noise generated during the operational phase, because the Sublime Access Road is currently in use for vehicular movement for the mine operations. There will not be a substantial increase in traffic flow.

Table 8: Impact ratings for nuisance noise on the surrounding community as a result of increased noise generation due to construction activities and the movement of construction vehicles

IMPACT OF NOISE ON SURROUNDING COMMUNITIES				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increased noise generation due to construction activities and the movement of construction vehicles*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**

PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***very low negative***		

PROPOSED MITIGATION MEASURES

Where reasonable and feasible, the proponent will apply best practice noise mitigation measures including:

- *Minimising consecutive works in the same locality*
- *Orienting equipment away from noise sensitive receptors*

As far as reasonably practicable, sources of significant noise should be enclosed. The extent to which this can be done depends on the nature of the machines to be enclosed and their ventilations requirements
Minimise reversing of equipment to prevent nuisance caused by reversing alarms
Driver practices when approaching and leaving the site should minimise noise emissions created through activities such as unnecessary acceleration and breaking squeal, especially on the access road to the construction site
Site inductions should cover the importance of noise control and available noise reduction measures
Construction contractors should be required to use equipment that is in good working order and that meets current best practice noise emission levels. This should be achieved by making it a component of contractual agreements with the construction contracts
The use of noise-producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only
The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the Owner shall be established prior to construction commencement that will allow for resolution of noise problems that cannot be immediately solved by the site supervisor
Stockpile areas will be decided and approved by the Project Manager and appointed ECO before construction commences on site
Construction vehicles, plant and machinery maintained and fitted with silencers
Regular maintenance on vehicle and equipment to be done

POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***

IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-4**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

i) Impact of change of visual character of the site

The addition of construction activities, construction crew, vehicles, equipment and camps may alter the current visual character of the area. The adjacent landowners, mainly the farmers may have direct views of the site.

Table 9: Impact ratings for change of visual character of the site

IMPACT OF CHANGE OF VISUAL CHARACTER OF THE SITE				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Impact of change of visual character of the site, due to construction activities*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***low negative***		
PROPOSED MITIGATION MEASURES				
The construction area must at all times be kept neat and tidy *All litter must be collected and removed (daily) and disposed of via the appropriate means* *Equipment and construction vehicles must be stored or parked in designated parking / storage areas* *The construction camp must be screened with shade cloth* *If construction is necessary during night-time, light sources should be directed inwards and downwards to prevent obtrusive lighting and light pollution to the surrounding area* *Dust suppression techniques should be implemented especially on windy days. Exposed soil stockpiles shall be covered, kept damp or protected using organic binding agents or alternative techniques that are not water intensive*				

POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-4**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

j) Impact of traffic congestion on surrounding road network

Due to construction activities (including construction of the new intersection off the R580 with Sublime Road) and associated machinery movement, the traffic patterns of the affected road (R580) and surrounding roads network may be affected.

Table 10: Impact ratings for traffic congestion on the surrounding road network

IMPACT OF TRAFFIC ON SURROUNDING ROAD NETWORK				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increased traffic caused by construction of the new access of the R580 and the movement of construction vehicles*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*3*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties.*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Definite***

IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-30***	***low negative***		
PROPOSED MITIGATION MEASURES				
Avoid movement of construction vehicles and machinery on main access roads during peak times (7:00 – 9:00) & (16:00 – 18:00) *If the above is unavoidable – implement traffic control measures such as points men at the intersection*				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*2*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties.*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-10**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

k) Employment creation and skills transfer as a result of opportunities for local people

Development directly influences changes in employment and income opportunities in communities. Such changes may be more or less temporary (e.g. construction projects, or seasonal employment).

In order to ensure that this impact leads to maximum benefit, it is important to ensure that employment opportunities created will lead to employment of local residents as far as possible. Emerging employment opportunities should be targeted at local residents. This will ensure a reduced dependency on temporary employment in addition to enhancing the living standards of local residents.

Table 11: Impact ratings for employment creation and skills transfer for local people

EMPLOYMENT CREATION AND SKILLS TRANSFER				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Employment creation and skills transfer as a result of available job/business opportunities for local people*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**

PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*12*	*2*
EXTENT	*4*	*The extent of the impact is rated as Regional as the effects of the impact extends beyond municipal boundaries*		
SEVERITY	*2*	*The severity of the impact is rated as Moderate positive as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are positively affected*	***Slightly Beneficial***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***24***	***low positive***		
PROPOSED MITIGATION MEASURES				
Unskilled and unemployed labor should be sourced from the surrounding local communities as far as possible; Skills development opportunities should be granted to community members and local job seekers, where needed; Eskom to work with the ELM to identify suitable local labour for the project; Project contracts between Exarro and the appointed sub-contractors should stipulate the use of local labour for unskilled and semi-skilled positions and tasks;				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*18*	*3*
EXTENT	4	*The extent of the impact is rated as Regional as the effects of the impact extends beyond municipal boundaries*		
SEVERITY	3	*The severity of the impact is rated as High positive as the natural, cultural or social functions and processes are altered to the extent that valued, important, sensitive or vulnerable systems or communities are substantially positively affected.*	***Moderately Beneficial***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**54**	**moderate positive**		
CONFIDENCE LEVEL				
Medium				

l) Impact of environmental pollution (noise, air, dust etc.) on the health of construction workers

Construction related public health impacts due to possible air/dust pollution, noise pollution, light pollution and vibration should also be considered. The contractor, as well as Eskom will therefore strive to abide by the requirements of the Occupational Health and Safety Act and international best

practice guidelines to ensure protection of the health and safety of employees and other persons at the workplace.

Table 12: Impact ratings for impact of environmental pollution (noise, air, dust etc.) on the health of construction workers

IMPACT OF ENVIRONMENTAL POLLUTION (NOISE, AIR, DUST ETC.) ON WORKERS				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Impact of environmental pollution (noise, air, dust etc.) on the health of construction workers, caused by construction activities.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-10***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Environmental pollution (noise, dust, etc.) must be limited as far as possible and the requirements of the EMPr be implemented to reduce the impact on surrounding residents *The necessary safety precautions should be taken and first aid supplies should be made available on site* *All project employees (including contractors) should undergo health and safety training on induction. Thereafter, health and safety training should be done on a regular basis* *Instruct contractors on how to work in line with the health and safety document and site rules* *Appoint a Health and Safety representative who must* *Carry out an inspection of every part of the project at monthly intervals* *Have a good understanding of all the applicable health and safety documents and standards applicable to the site* *Review any risk assessments which form part of the health and safety document and provide meaningful and appropriate suggests for improvements* *Develop a written report on any health and safety problems / concerns noted during their scheduled inspections*				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural,*	***Negligible***	***Unlikely***

		cultural and social functions and processes are minimally affected		
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-5**	**very low negative**		
CONFIDENCE LEVEL				
High				

Operation Phase

a) Disturbance to fauna

Roads generally have a negative impact on fauna as many animals are killed by collisions with vehicles while trying to cross busy roadways. Increasing the width of the road will not only increase the distance over which crossing fauna need to travel, but will also lead to an increase in traffic volume as well as an overall increase in speed of the vehicles (due to the improved pavement condition of the road).

Table 13: Impact ratings for Disturbance to fauna

DISTURBANCE TO FAUNA				
PROJECT PHASE	*Operational phase*			
DIRECT IMPACT	*Disturbance to fauna, caused by negative interactions with fauna and vehicles*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-14*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Moderately detrimental***	***Likely***

IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-28***	***low-- negative***		
PROPOSED MITIGATION MEASURES				
During operation, a strict speed limit of 30km/h must be adhered to. Truck drivers must remain vigilant to fauna attempting to cross the road, and must slow down or stop to avoid collisions with animals.				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-7*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Slightly detrimental***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-7**	**Very low negative**		
CONFIDENCE LEVEL				
Medium				

m) Pollution of downstream watercourses

During the operational phase, stormwater runoff may carry pollution from the road to the surrounding natural areas. This may result in the contamination of the wetland areas (impacting on sensitive vegetation and faunal habitat) as well as watercourses further downstream.

Table 14: Impact ratings for increased pollution of downstream watercourses

INCREASED POLLUTION OF WATERCOURSES				
PROJECT PHASE	*Operational phase*			
DIRECT IMPACT	*Increase in pollution of watercourses and impact on sensitive vegetation and faunal habitat, caused by contaminated stormwater runoff entering into the watercourses and littering during the operational phase*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-14*	*2*

EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Moderately Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-28***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Formalised stormwater channels, culverts and drains fitted with silt traps must be included in the road design *Pollution from the road must be prevented from entering the surrounding wetlands and other natural areas.* *Stormwater channels must be designed carefully and all drains must be fitted with stilt and any other appropriate pollution traps* *Silt and litter traps must be checked and cleared regularly* *Litter thrown from trucks must be prohibited* *Oil or fuel spills must be avoided with regular vehicle checks. Any spills must be attended to immediately*				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-7*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Slightly Detrimental***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-7**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Cumulative Impacts

The NEMA EIA Regulations define cumulative impact as follows: “in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.”

The previous sub-sections assessed the potential environmental impacts which could occur as a result of the construction and operation of the proposed Project. The impacts assessed above are direct and immediate, whereas cumulative impacts may not be significant on their own but become significant

when coupled with others. In order to consider the cumulative impact, the impacts of the proposed development and its intended purpose, as assessed above, must be placed in context.

The access road is currently existing and in operation. Therefore, the road currently exert various impacts on the surrounding environmental conditions and landscape. It is important that the current and existing road is proposed for upgrading. Therefore the development will occur within the existing footprint, with the addition of widening the road by approximately 3m on either sides of Sublime Road. Therefore, cumulative impacts are not deemed to be significant in the context and nature of this project. Disturbance caused by the construction phase may add to the existing impact of alien and invasive plant species prevalent in the landscape. This may be mitigated easily by following all recommendations and suggested mitigation measures provided in the project EMPr.

Decommissioning Phase

Please note that it is not envisaged that the proposed road and intersection will be decommissioned in the near future. However should this occur, then an impact assessment will need to be undertaken at that stage to confirm the status quo of the receiving environment and potential impacts on these conditions. At this stage it is assumed that the nature of the impacts that will be experienced during decommissioning activities will be strongly related to the impacts during the construction phase of the project.

Activity Alternative 2: Constructing a temporary bypass

Please note that the environmental impacts associated with the implementation of Activity Alternative 2 is similar to the impacts outlined and assessed as part of Activity Alternative 1 above, with the exception of the following:

Reduced traffic congestion during construction activities, as a temporary by-pass lane would be constructed be constructed to carry the traffic, whilst allowing the road to be constructed unhindered.

Activity Alternative 3: Rerouting of traffic for short periods (preferred alternative)

Please note that the environmental impacts associated with the implementation of Activity Alternative 1 is similar to the impacts outlined and assessed as part of Activity Alternative 1 above, with the exception of the following:

Reduced traffic congestion during construction activities, as a temporary by-pass lane would be constructed be constructed to carry the traffic, whilst allowing the road to be constructed unhindered.

Comparative summary of the findings for Activity Alternative 1, 2 and 3

Please note that the impacts associated with Activity Alternative 1, 2 and 3 are very similar and as such, no significant difference in terms of impact significance can be used as motivation in selecting one of them as the preferred option. When comparing the alternatives with one another, **Activity Alternative 1** will only allow single lane of traffic to be accommodated and traffic is controlled by Stop-Go signage at the end points of the section to be constructed. This alternative impacts negatively on

traffic movement as waiting queues must be cleared before opposing traffic are allowed to pass. Therefore, this increases traffic congestion, interrupts mine operations and reduces productivity in the road construction activities.

When comparing the alternatives with one another, **Activity Alternative 2** is better than Activity Alternative 1 because it involves construction of a 7m wide temporary bypass lane that allows traffic to flow unhindered whilst undertaking the road works.

However, when comparing Activity Alternative 3 with the other two alternatives, it is important to note that this alternative incorporates both Activity Alternative 1 and 2. Therefore, this alternative allows possible rerouting of the outgoing trucks so that the road can be closed to allow the drainage crossings to be constructed.

From a practical and convenience point of view, **Activity Alternative 3 is therefore preferred** as it combines both alternative 1 and 2 in constructing the road to achieve productivity in road works construction, allows for continued mining activities and minimises the impacts on the environment.

Therefore, Activity Alternative 3 is the preferred alternative from the EAP's point of view as it allows the development to occur in the most productive, efficient and practical way possible.