

APPENDIX J – IMPACT TABLES
GEOGRAPHICAL AND PHYSICAL

SOIL EROSION AND DUST

Preferred and only alternative:	Geographical and Physical Impacts
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	Soil erosion and dust
Nature of impact:	Soil erosion can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should rains fall during construction. Due to the sloping nature of the terrain, it is unlikely that a shallow perched water table will develop on site.
Extent and duration of impact:	Extent 1 & Duration 5 (permanent)
Consequence of impact or risk:	Clearing and excavation activities can result in erosion and dust.
Magnitude	2
Probability of occurrence:	2 (Improbable: some possibility, but low likelihood)
Degree to which the impact may cause irreplaceable loss of resources:	2-Resource may be partly destroyed (PR)
Degree to which the impact can be reversed:	Completely reversible (R)
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation
Cumulative impact prior to mitigation:	Exposing soil may lead to erosion and dust generation if not mitigated.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	16 - Low
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	1-Completely mitigatable (CM)
Proposed mitigation:	<ul style="list-style-type: none"> • Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate construction areas only. • Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately. • Undertake dust suppression as needed. • Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion. • Undertake storm water management measures as required.
Residual impacts:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.

Cumulative impact post mitigation:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	8 - Low
OPERATIONAL PHASE	
Potential impact and risk:	Soil erosion and dust
Nature of impact:	Soil erosion can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should rains fall during construction. Due to the sloping nature of the terrain, it is unlikely that a shallow perched water table will develop on site.
Extent and duration of impact:	Extent 1 & Duration 5 (permanent)
Consequence of impact or risk:	Clearing and excavation activities can result in erosion and dust.
Magnitude	2
Probability of occurrence:	2 (Improbable: some possibility, but low likelihood)
Degree to which the impact may cause irreplaceable loss of resources:	2-Resource may be partly destroyed (PR)
Degree to which the impact can be reversed:	Completely reversible (R)
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation
Cumulative impact prior to mitigation:	Exposing soil may lead to erosion and dust generation if not mitigated.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	16 - Low
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	1-Completely mitigatable (CM)
Proposed mitigation:	<ul style="list-style-type: none"> • Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate construction areas only. • Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately. • Undertake dust suppression as needed. • Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion. • Undertake storm water management measures as required.

Residual impacts:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Cumulative impact post mitigation:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	8 - Low
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	Similar to impacts associated with construction phase.

NO GO OR NO DEVELOPMENT ALTERNATIVE	
Potential impact and risk:	Not applicable.

WATER POLLUTION

Preferred and only alternative:	Geographical and Physical Impacts
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	Impact of construction activities on surface and underground water pollution.
Nature of impact:	Construction could result in the pollution of surface water and eventually result in ground water pollution. Storm water contamination will result in surface water pollution. Construction activities such as excavation and clearing of vegetation and or diesel and oil spills could impact surface and ground water quality.
Extent and duration of impact:	Extent 3 (Within a 20 km radius of the centre of the site) & Duration 2 (2-5 years)
Consequence of impact or risk:	Possible pollution of surface and ground water.
Magnitude	6
Probability of occurrence:	4 (most likely)
Degree to which the impact may cause irreplaceable loss of resources:	Partly destroyed 2 (PR)
Degree to which the impact can be reversed:	Partly reversible 6-89% (PR)
Indirect impacts:	Pollution of water resources.
Cumulative impact prior to mitigation:	Diesel and oil spills affecting ground and surface water quality.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	44 - Medium
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	2-Partly mitigatable (PM)

Proposed mitigation:	Mitigation measures included in EMP, attached as Appendix H, shall be adhered to.
Residual impacts:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Cumulative impact post mitigation:	Diesel and oil spills affecting ground and surface water quality.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	27 – Low
OPERATIONAL PHASE	
Potential impact and risk:	Not applicable to operational phase
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	Similar to impacts associated with construction phase.

NO GO OR NO DEVELOPMENT ALTERNATIVE	
Potential impact and risk:	Not applicable.

DISTURBANCE TO SUBSURFACE GEOLOGICAL LAYERS

Preferred and only alternative:	Geographical and Physical Impacts
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	Construction activities can affect the underlying geological layers on site to some extent.
Nature of impact:	Disturbance to subsurface geological layers.
Extent and duration of impact:	Extent 1 & Duration 2 (2-5 years)
Consequence of impact or risk:	Excavation activities can disturb subsurface geological layers.
Magnitude	2
Probability of occurrence:	2 (Improbable: some possibility, but low likelihood)
Degree to which the impact may cause irreplaceable loss of resources:	2-Resource may be partly destroyed (PR)
Degree to which the impact can be reversed:	0% (IR)
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation
Cumulative impact prior to mitigation:	It is not anticipated that the impact will be high as the affected substrata is very shallow and the integrity of the underlying ground structures will thus not be sacrificed.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	10 – Low
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	2

Proposed mitigation:	Due to the nature of the impacts, not much can be done to mitigate the impact, only the severity of it can be managed. Mitigation and management for affecting geology is to ensure that removal of soil is kept to a minimum – removal of soil should only be in areas where infrastructure will be established.
Residual impacts:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Cumulative impact post mitigation:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	10 - Low
OPERATIONAL PHASE	
Potential impact and risk:	Not applicable to operational phase.
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	Similar to impacts associated with construction phase.

NO GO OR NO DEVELOPMENT ALTERNATIVE	
Potential impact and risk:	Not applicable.

NOISE

Preferred and only alternative:	Socio-Economic Impacts
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	Impact of noise on surrounding environment.
Nature of impact:	Environmental noise pollution. Nuisance impacts could relate to the increase noise and disturbance associated with the proposed development, e.g. noise, traffic etc. Construction activities and construction personnel on the sites, and construction vehicles moving to and from the sites would cause an increase in noise in the area, which may impact negatively upon the adjoining landowners.
Extent and duration of impact:	Extent 2 (On site or within 100 m of the site) & Duration 1 (0 – 1 years)
Magnitude	2
Consequence of impact or risk:	Nuisance
Probability of occurrence:	3 (distinct possibly)
Degree to which the impact may cause irreplaceable loss of resources:	1-Resource will not be lost (R)
Degree to which the impact can be reversed:	Completely reversible (R) - This will not be a long-term impact nor will it have an impact on the natural processes. It is thus 100% reversible.
Indirect impacts:	Nuisance
Cumulative impact prior to mitigation:	Nuisance

Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	15 – Low
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	1- Completely mitigatable (CM)
Proposed mitigation:	<ul style="list-style-type: none"> • Working hours will be restricted to normal working hours. • All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels. • All plant and machinery are to be fitted with adequate silencers. • No sound amplification equipment such as sirens, loud hailers or hooters may be used on site, after normal working hours, except in emergencies. • If work is to be undertaken outside of normal work hours, permission must be obtained from the Local Authority
Residual impacts:	Nuisance
Cumulative impact post mitigation:	Nuisance
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	15 - Low
OPERATIONAL PHASE	
Potential impact and risk:	Not applicable to operational phase.
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	Similar to impacts associated with construction phase.

NO GO OR NO DEVELOPMENT ALTERNATIVE	
Potential impact and risk:	If bulk services are not upgrade it can lead to non-supply or interrupted supply of services
Nature of impact:	If bulk services are not upgrade it can lead to non-supply or interrupted supply of services
Extent and duration of impact:	None. No construction
Magnitude	None. No construction
Consequence of impact or risk:	None. No construction
Probability of occurrence:	None. No construction
Degree to which the impact may cause irreplaceable loss of resources:	None. No construction
Degree to which the impact can be reversed:	None. No construction
Indirect impacts:	None. No construction

Cumulative impact prior to mitigation:	None. No construction
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	High negative
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	1- Completely mitigatable (CM)
Proposed mitigation:	Upgrade of the bulk water pipeline
Residual impacts:	Nuisance
Cumulative impact post mitigation:	Nuisance
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	High positive

VISUAL IMPACT

Preferred and only alternative:	Socio-Economic Impacts
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	The surrounding land users/ owners will be exposed to the presence of the construction machinery
Nature of impact:	Visual impact of construction of proposed serviced erven
Extent and duration of impact:	Extent 3 & Duration 2 (2-5 years)
Consequence of impact or risk:	The surrounding land users/ owners will be exposed to the presence of the construction machinery
Magnitude	2
Probability of occurrence:	4 (most likely)
Degree to which the impact may cause irreplaceable loss of resources:	2 (PR)
Degree to which the impact can be reversed:	2 (PM)
Indirect impacts:	
Cumulative impact prior to mitigation:	Unsightly construction camp/s and activities on construction site
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	28 - Low
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	Low
Degree to which the impact can be mitigated:	Low

Proposed mitigation:	<ul style="list-style-type: none"> Proposed construction activities must be limited to development footprint site. Construction camp must be neatly fenced and construction site must be neat and tidy. Stockpile construction materials in one specific area. Criteria
Residual impacts:	Unsightly
Cumulative impact post mitigation:	The surrounding environment will not be affected by construction activities
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	24 – Low
OPERATIONAL PHASE	
Potential impact and risk:	
Nature of impact:	Not applicable to operational phase
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	Similar to construction phase.

NO GO OR NO DEVELOPMENT ALTERNATIVE	
Potential impact and risk:	Not applicable.

Preferred and only alternative:	
Development Construction	Geographical and Physical Impacts
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	Soil erosion and dust
Nature of impact:	Disturbance to soil which is caused during the construction may lead to erosion of the site and surrounds.
Extent and duration of impact:	Extent 1 (footprint) & Duration 1
Magnitude:	2
Consequence of impact or risk:	Clearing and excavation activities can result in erosion and dust.
Probability of occurrence:	2 (I)
Degree to which the impact may cause irreplaceable loss of resources:	2 (PR)
Degree to which the impact can be reversed:	PR
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation
Cumulative impact prior to mitigation:	Exposing soil may lead to erosion and dust generation if not mitigated.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	8 - Low
Degree to which the impact can be avoided:	High

Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	1 (CM)
Proposed mitigation:	<ul style="list-style-type: none"> • Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate construction areas only. • Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately. • Strict compliance with the EMPr.
Residual impacts:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Cumulative impact post mitigation:	It is not anticipated that the impact will be high if the mitigation measures are adhered to.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low
OPERATIONAL PHASE	
Potential impact and risk:	Soil erosion and dust
Nature of impact:	Not Applicable.
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	Soil erosion and dust
Nature of impact:	Similar to that in the development phase.

NO GO OR NO DEVELOPMENT ALTERNATIVE	
Potential impact and risk:	Not applicable.

AQUATIC BIODIVERSITY IMPACTS

Development Construction	Biological Aspect Impacts
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	Flow modification
Nature of impact:	Not Applicable
OPERATIONAL PHASE	
Potential impact and risk:	Flow modification
Nature of impact:	Construction of pipeline through Diep River.
Extent and duration of impact:	Extent 1 & Duration 5
Magnitude:	2
Consequence of impact or risk:	Flow modification
Probability of occurrence:	2
Degree to which the impact may cause	2-Resource may be partly destroyed (PR)

irreplaceable loss of resources:	
Degree to which the impact can be reversed:	Irreversible (IR)
Indirect impacts:	Loss of significantly impacted upon habitat and bed/bank modification.
Cumulative impact prior to mitigation:	There is only likely to be surface water runoff from the catchment between the months of April/May to October.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	16 - Low
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	2 - Partly mitigatable (PM)
Proposed mitigation:	Pipeline must be buried, and the area sloped to its original levels and allow to recover with <i>Phragmites australis</i> on site. Wetland and riverbed will not be disturbed. The pipe will be drilled through underneath the Diep River.
Residual impacts:	Flow modification
Cumulative impact post mitigation:	Flow modification
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	10 - Low
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	Impact on sensitive environments (rivers, wetlands etc.)
Nature of impact:	Similar to that in the development phase.

TERRESTRIAL BIODIVERSITY IMPACTS

Preferred Impact Area	Degradation / loss of naturally occurring / indigenous flora and habitats, ecological functioning and biodiversity.
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	Terrestrial CBA in the urban area was incorrectly mapped, but the pipeline route will not impact on them. Aquatic CBA and ESA associated with the Diep River and its tributary was mapped. The

	pipeline will impact on the Diep River Aquatic CBA and ESA.
Nature of impact:	No vegetation, except for <i>Phragmites australis</i> will be removed if the proposed development is approved.
Extent and duration of impact:	Extent Temporary
Consequence of impact or risk:	Activities can disturb and impact on surrounding terrestrial biodiversity features.
Magnitude	2
Probability of occurrence:	5
Degree to which the impact may cause irreplaceable loss of resources:	Resource will be destroyed
Degree to which the impact can be reversed:	Not reversible
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation which may affect surrounding terrestrial biodiversity features.
Cumulative impact prior to mitigation:	Loss of significantly impacted upon vegetation and habitat.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low due to transform nature of impact areas
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<p>Construction activities must be controlled to ensure that the adjacent vegetated areas are not negatively impacted.</p> <p>Topsoil must be removed and stockpiled on one side of the trench. Then the soil must be removed and stockpiled on other side of topsoil stockpile next to trench to prevent contamination (this must all be done inside the 10m wide corridor). Once pipe is laid it must be covered first with the excavated soil covered by the stockpiled topsoil and the area must be shaped and left that seeds can germinate and cover the pipeline.</p> <p>Invasive vegetation to be removed during construction not used to spread and</p>

	cover the construction impact areas must be disposed of at landfill site in such a manner that seeds must not be able to spread from the disposal site or during transportation.
Residual impacts:	None
Cumulative impact post mitigation:	Will control and reduce the impacts on critically endangered vegetation.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low
OPERATIONAL PHASE	
Potential impact and risk:	Not applicable to operational phase.
Nature of impact:	
Extent and duration of impact:	
Consequence of impact or risk:	
Magnitude	
Probability of occurrence:	
Degree to which the impact may cause irreplaceable loss of resources:	
Degree to which the impact can be reversed:	
Indirect impacts:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be avoided:	
Degree to which the impact can be managed:	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Residual impacts:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	

NO GO OR NO DEVELOPMENT ALTERNATIVE	
Potential impact and risk:	Not applicable.