PROJECT IMPACT ASSESSMENT, SIGNIFICANCE AND MITIGATION MEASURES SUMMARY

The following impact rating approach used by EnviroAfrica CC is a basic exponential rating system to assess actual and potential negative and positive environmental impacts.

Environmental activities or aspects are identified, based on:

- the phases of the project,
- the nature (or description) of the actual and potential impacts of the activities.

For every project activity or aspect, various environmental impacts are listed. Every negative impact is allocated a -value as per each of the following criteria:

- Probability (Likelihood)
- Extent
- Duration (Frequency)
- Consequence (Receiving Environment)
- Magnitude (Intensity/severity)

Every positive impact is allocated a +value as per each of the following criteria:

- Probability (Likelihood)
- Extent
- Duration (Frequency)
- Magnitude (Intensity/severity)

Once a value is allocated for each of the criterion, the scores are averaged to determine the final impact rating see Table 1 below.

EnviroAfrica then further assesses environmental significance, based on the nature of the impact, as per the score and colour key which forms part of Table 1 below. This results in impacts having either a low (indicated in green), medium (indicated in yellow) or high (indicated in orange and red) negative significance, and a low (light blue), medium (blue) or a high (dark blue) positive significance

Note: i. As a baseline, impact rating values/scores are allocated taking the **worst case** scenario into account i.e. with no mitigation. The baseline rating is compared with those after mitigation has been taken into account i.e. the post-mitigation rating. Post mitigation rating is used for the actual impact assessment.

SIGNIFICANCE CRITIERIA	Very High	High	Medium	Low	Negligible (very-low)
Value	**16**	**8**	**4**	**2**	**1**
Probability (likelihood) **(P)**	Definite. Impact will definitely occur (impact will occur regardless of any prevention measures)	Highly probable. Very likely for impact to occur.	Probable. Impact may likely occur.	Improbable. Impact may occur. Distinct Possibility	Improbable. Low likelihood/unlikely for impact to occur.
Extent (E)	Impact potentially reaches beyond national boundaries	Impact has definite provincial/potential national consequences	Impact confined to regional area/ town	Impact confined to local region and impact on neighbouring properties	Impact confined to project property / site
Duration (D)	Permanent The impact is expected to have a permanent impact, with very little to no rehabilitation possible	Long-Term The impact is expected to last for a long time after construction with rehabilitation expected to be 15-50 years. Impact is reversible but only with long-term mitigation	Medium-term The impact is expected to last for some time after construction with rehabilitation expected to be 5 - 15 years. Impact is reversible but only with on-going mitigation	Short-term The impact is expected to last for a relatively short time with rehabilitation expected to be 2-5 years. The impact is reversible through natural process and/or some mitigation.	Very short/ temporary The impact is expected to be temporary and last for a very short time with rehabilitation expected to be less than 2 years. The impact is easily reversible through natural process and/or some mitigation.
Magnitude (Intensity/ Severity) **(M)**	It is expected that the activity will have a very severe to permanent impact on the surrounding environment. Functioning irreversibly impaired. Rehabilitation often impossible or unfeasible	It is expected that the activity will have a severe impact on the surrounding environment. Functioning may be severely impaired and may be temporarily cease. Rehabilitation will be needed to restore system integrity	It is expected that the activity will have an impact on the surrounding environment, but it will maintain its function, even if moderately modified (overall integrity not compromised). Rehabilitation easily achieved	It is expected that the activity will have a perceptible impact on the surrounding environment, but it will maintain its function, even if slightly modified (overall integrity not compromised). Rehabilitation easily achieved	It is expected that the impact will have little or no effect on the integrity of the surrounding environment
Receiving environment (Consequence): **(RE)**	Very sensitive, pristine area – protected site or species permanently or seasonally present	Unused area containing only indigenous fauna / flora species	Unused area containing indigenous and alien fauna / flora species	Semi-disturbed area already rehabilitated / recovered from prior impact, or with moderate alien vegetation	Disturbed area/ transformed/ heavy alien vegetation

ENVIRONMENTAL RATING SIGNIFICANCE KEY:

Negative Impacts

SIGNIFICANCE	RATING	Final rating score / value range
Very Significant	Very High	-11 to -16
Significant	High	-7 to <-11
Increasing Significance	Medium	-4 to <-7
Insignificant	Low	-2 to <-4
	Very Low	-1 to <-2

Positive Impacts

SIGNIFICANCE	RATING	Final rating score / value range
Significant	High	10 to 16
Increasing Significance	Medium	4 to <10
Insignificant	Low	1 to <4

Table 1: **Environmental Significance Rating Methodology (rating criteria and significance key)**

**PLEASE SEE RATING SCORING MATRIX*

Nature of Impact			Impact Assessment Ranking and Proposed Mitigation		
No.	**Aspect**	**Impact**	**Environmental Significance (without Mitigation)**	**Proposed Mitigation (i.e. Proposed mitigation to reverse/ avoid, manage or mitigate identified impacts associated with construction, operation, and decommissioning/ closure phases)**	**Environmental Significance (After Mitigation)**
Preferred Layout					
CONSTRUCTION PHASE					
1	Soil	On site erosion due to improper management of stormwater during construction. Exposed soil will be susceptible to erosion during the construction phase.	-6	All construction activities must be carried out with caution. The following mitigation measures must be implemented: - Erosion mitigation measures must be implemented[1]; - No storage of materials, including stockpiling of any material, is permitted within 20m of the drainage line (as per the Freshwater Assessment – Appendix D2) or within 32m of the irrigation canal; - Any soil which has been exposed due to construction activities must be rehabilitated to prevent erosion; - Vegetation must be cleared in phases (i.e. where construction activities are to be conducted) to reduce the extent of soil susceptible to erosion at any point in time; - Temporary stormwater measures, such as the use of temporary berms, with silt traps (e.g. shade netting) to prevent stormwater runoff flowing into the drainage line, should be implemented to ensure that material does not wash into the drainage line during construction; - Once areas of exposed soil have been adequately shaped, these areas must be rehabilitated with vegetation characteristic of the Lower Gareip Alluvial (EN) and Bushman Arid Grassland (LT) vegetation type. Any implemented erosion mitigation measures can only be removed once vegetation has established; - The presence of alien invasive plant species must be managed.	-3

[1] Erosion control methods include, but are not limited to, silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats and mulching. Exposed areas, susceptible to erosion, must be rehabilitated. This includes planting vegetation, characteristic of the Lower Gariep Alluvial vegetation or Bushmanland Arid Grassland vegetation type (where the ecosystem type was impacted), to stabilize the soil.

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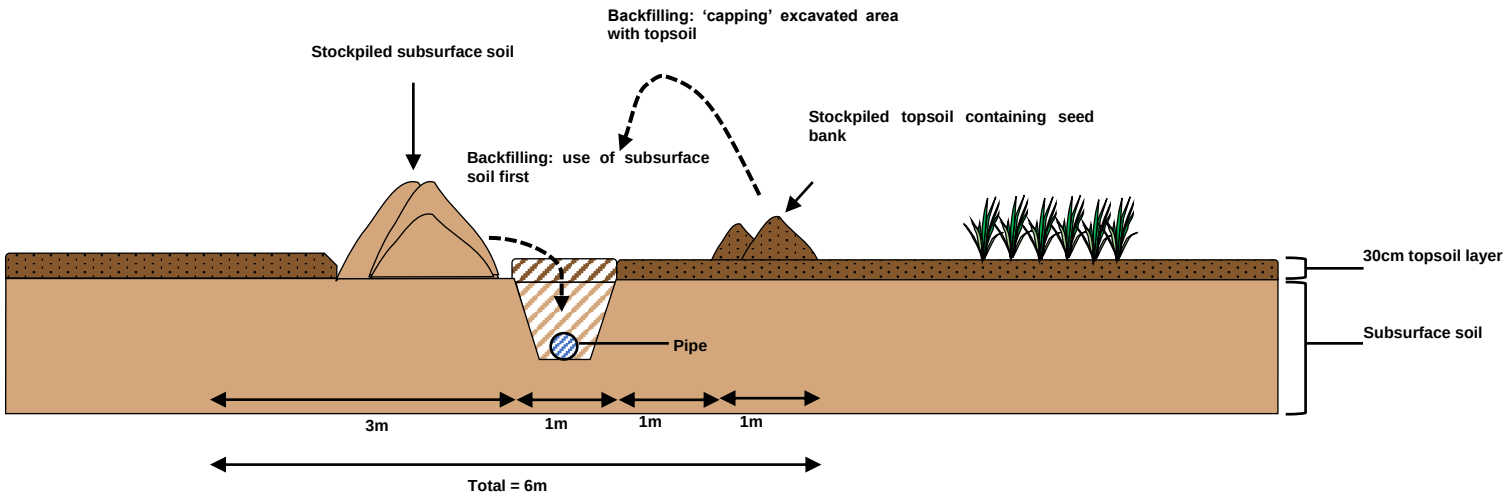
Preferred Layout					
		Erosion and safety hazards associated with excavated pipelines which are not backfilled.	-6	The following mitigation measures must be implemented should any trenches be excavated for associated housing infrastructure: - Excavated material must be separated into topsoil (generally upper 30cm) and subsoil (remaining) and stockpiled accordingly. Stockpiles must be located at least 32m away from any drainage line or other sensitive area (see figure below); - Trenches must be excavated in sections and backfilled once the pipeline has been laid. The excavated trench must not remain open indefinitely; - Any pooled water in open trenches must be pumped out. - Trenches must be demarcated; - Material must be backfilled in the order it was excavated (i.e. backfilled first with subsoil followed by topsoil). Backfilled trenches must be rehabilitated.	-3
2					

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Preferred Layout					
3	Watercourse	Sedimentation of drainage line due to the uncontrolled stormwater runoff naturally flowing towards the drainage line.	-7	A drainage line is located adjacent to the eastern and southern boundary of the proposed site for development. A small section of this drainage line is located within the proposed site of development. The Present Ecological State (PES) of the drainage line was classified as Class D, characterized as largely modified with a significant loss of natural habitat, biodiversity, and ecosystem functioning. The Ecological Importance (EI) of the drainage line (in close proximity to the site) is based on the presence of threatened fish species. As the non-perennial drainage line was dry at the time of the site visit, the EI could not be measured. No endangered fauna or flora were present along the drainage line. A buffer zone of at least 20m wide should be maintained from the drainage line. The irrigation canal was constructed underneath the drainage line where stormwater flows within the drainage line. The stormwater will flow across the dirt road and into a cut-off trench, subsequently flowing into a concrete gulley and then the Orange River. Therefore, the sedimentation of the drainage line must be mitigated. The following mitigation measures must be implemented: - Construction only during the dry season, - Limit the footprint, - Vegetate disturbed areas. - All construction activities, within close proximity to the drainage line, must be carried out with extreme caution; - All construction activities, within close proximity to the drainage line, must be carried out with extreme caution; - Applicable erosion mitigation measures must be implemented[1]; - The proposed access road must be strictly adhered to. No ad hoc roads are permitted; - Excluding the proposed access road, the associated drainage line must be demarcated as a “no-go” zone; - No storage of materials, including stockpiling of any material, is permitted within 32m of the drainage line or irrigation canal;	-4

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Preferred Layout					
				- Any soil which has been exposed due to construction activities must be rehabilitated to prevent erosion; - Vegetation must be cleared in phases (i.e. where construction activities are to be conducted) to reduce the extent of soil susceptible to erosion at any point in time; - Temporary stormwater measures, such as the use of temporary berms, with silt traps (e.g. shade netting) to prevent stormwater runoff flowing into the drainage line, should be implemented to ensure that material does not wash into the drainage line during construction; - Once areas of exposed soil have been adequately shaped, these areas must be rehabilitated with vegetation characteristic of the Lower Gareip Alluvial (EN) or Bushman Arid Grassland vegetation type (see Figure 10 in DBAR). Any implemented erosion mitigation measures can only be removed once vegetation has established; - Stormwater runoff from any platforms must be diverted away from the drainage line. If no formalized stormwater network exists, water should be directed to a temporary detention pond to reduce the sedimentation of stormwater networks on site; - The contractor must check the site for erosion after each rainfall event and rectify any areas eroded/ susceptible to erosion.	
4		Contamination of drainage line and irrigation canal due to inappropriate dumping of waste, storage and use of hazardous materials/ substances.	-7	As per the Engineer's Services Report, all existing households within the Gariep Settlement are serviced by Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present. The construction of a full-borne sewerage system is recommended. The following mitigation measures must be implemented: - Construction only during the dry season, - Limit the footprint, - Vegetate disturbed areas. - All construction activities, within close proximity to the drainage line, must be carried out with extreme caution; - Adequate waste disposal must be implemented on site.	-2

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Preferred Layout					
				- All hazardous materials and substances must be stored within a secured (i.e. lockable), undercover area with a hardened surface; - Any spillage must be immediately cleaned. Contaminated soil must be collected, stored, and disposed of at a registered, hazardous disposal facility. A disposal receipt is required as proof of safe disposal. A complete spill kit is required; - The use of hazardous materials and substances, such as cement mixing, must be conducted on hardened surfaces (such as batching boards or concrete) protected from stormwater runoff; - Used oil must be collected, securely stored and disposed of by a registered used-oil contractor. The collection and disposal of used oil must be recorded and proof of disposal (i.e. disposal receipt) must be obtained and kept on site; - The construction site camp must be located at least 50m away from the watercourse; - Vehicle washing and maintenance areas must be demarcated. - All waste, generated, must be collected, stored, and disposed of at the relevant (general or hazardous) waste disposal facility; - MSDS of all hazardous materials must be kept on site. As per the Botanical Assessment (Appendix D1), the Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community.	
5	Waste	Insufficient number of toilets and / or inappropriate disposal of sewage generated during the construction phase.	-6	The increase in construction personnel during the construction phase will require an appropriate number of toilet facilities for the site. This impact can be fully mitigated. - Appropriate and sufficient toilet facilities (1 toilet per 15 employees) must be provided by the contractor; - All toilet facilities must be checked on a daily basis; - All toilet facilities must be emptied and cleaned on a weekly basis or as agreed (in writing) with the ECO and DENC. - A registered waste removal company must remove sewage waste from the site or be disposed of at a permitted WWTW.	-3

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Preferred Layout					
				- Toilet waste receipts must be obtained, and kept on site, for proof of safe disposal.	
6		Temporary increase in waste and litter contaminating the receiving environment (including the Gariep Canal)	-5	The construction phase of the project will see an increase in construction staff on site and therefore an increase in waste. - Littering will not be permitted on site; - A designated waste storage area must be established at the construction site camp. Appropriate waste receptacles must be set up at intervals along any pipeline routes and emptied into the main waste storage area at the end of each day; - Waste must be removed from site and disposed of at a registered waste disposal site; - Safe disposal slips for the disposal of all waste must be obtained and kept on site as proof of safe disposal.	-3
7	Botanical	Clearance of vegetation from within the Lower Gareip Alluvial (EN) and Bushman Arid Grassland (LT). Geology & soils: Potential impact on special habitats (e.g. true quartz or "heuweltjies").	-10	As per the Botanical Assessment, the following mitigation measures must be implemented to ensure that the proposed development does not pose a significant threat to the environment: - All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report. - A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies. - **Before any work is done** protected tree species must be marked and demarcated (Refer to Table 2 of Appendix D1). - **Before any work is done** search & rescue as discussed in Table 3 must be completed. - Lay-down areas or construction sites must be located within the construction footprint. - No clearing of any area outside of the construction footprint may be allowed.	-4

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Preferred Layout					
				- All waste that had been illegally dumped within the footprint must be removed to a Municipal approved waste disposal site. - An integrated waste management approach must be implemented during construction. o Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites. - Alien invasive *Prosopis* plants within the footprint (and immediate surroundings) must be removed in a responsible way (to ensure against regrowth). - The Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community.	
8		Protected & endangered plant species: Potential impact on threatened or protected Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	-8	This impact cannot be fully mitigated. Two species protected in terms of the National Forest Act (NFA) were observed and identified on site, namely *Vachellia erioloba* and *Boscia albitrunca*. Other protected plant species, as per the NCNCA (listed in Table 1 of appendix D1) were observed on site. - A permit, as per the NFA (or NCNCA, is required should any protected plant species need to be disturbed, relocated, removed, or destroyed; - As per the Botanical Assessment, *Euphorbia braunsii* (see Table 3 of Appendix D1) must be actively searched for and rescued. These plants must be relocated in the presence of the ECO; - All protected plant species, outside of the development footprint, must not be disturbed; - No plant species are to be harvested from site, and - Should the contractor be unsure of whether a plant species is protected, the ECO must be contacted immediately prior to the disturbance of the plant species in question. - Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-4

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Preferred Layout					
9		Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	-7	This impact cannot be avoided. However, the following mitigation measures will be implemented; - Any exposed area will be rehabilitated with indigenous plant species, characteristic of the Lower Gareip Alluvial (EN) and/ or Bushman Arid Grassland vegetation type. - A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies and requirements of the any competent authority; - Before any work is done, the site and access routes must be clearly demarcated (with the aim at minimal width / smallest footprint). The demarcation must include; o Site access, which must be limited to routes approved by the ECO; o Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO; o Indiscriminate clearing of areas must be prohibited; o All alien plants must be removed from within the construction footprint and immediate surroundings. - All areas impacted as a result of construction must be rehabilitated on completion of the project. o This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material. o It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment. - Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-3
10		Landuse and cover: Potential impact on	-4	Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-3

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Preferred Layout					
		socio-economic activities.			
11		Connectivity: Potential loss of ecological migration corridors.	-4	Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-3
12		Encroachment of alien invasive vegetation in disturbed areas during construction activities. Invasive alien plant species: Potential invasive plant infestation as a result of the activities.	-7	Portions of the site has been heavily invaded by the alien invasive *Prosopis* tree. These plants should be removed responsibly before development commence. The *Prosopis* trees must be responsibly removed to reduce regrowth and encroachment. The following mitigation measures must be implemented: - The construction area must be kept free of alien invasive plants. Regular inspections of the site must take place. The following methods of alien plant control can be adapted: - Physical control – which includes pulling alien plants out by hand, using hand tools, and/ or mechanised tools, as well as ringbarking/ girdling; - To reduce alien plant encroachment, construction areas must be rehabilitated as soon as practically possible after the completion of construction activities. - The area previously disturbed by construction activities must be regularly inspected following rehabilitation where any alien invasive plant species must be removed. - Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-3
13		Veld fire risk: Potential risk of veld fires as a result of the activities.	-4	Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-3
14		Cumulative impacts: Cumulative impact associated with proposed activity.	-9	Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-4

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Preferred Layout					
15		The "No-Go" option: Potential impact associated with the No-Go alternative.	-1	The vegetation present on site will remain as is. The presence of alien invasive plant species must be managed in accordance with due diligence. Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact.	-1
16	Services	Increased demand for services impacting current services capacity (i.e. increased demand for water, electricity, sewage disposal).	-10	As standard construction practice, the engineer and contractor must identify all existing services that may be affected in the study area prior to construction. The following mitigation measures must be implemented: - Any infrastructure which was damaged or removed, during the construction phase, must be repaired and/or replaced. - As per the Services Report, a full-borne Wastewater Treatment Works (WWTWs) is recommended where the current method of sewage disposal is the use of Ventilated Improved Pit (VIP) toilets.	-4
17	Impact on Cultural, Archaeological Palaeontological, and Heritage	Artefacts may be discovered and/or damaged during the construction phase.	-3	No significant heritage sites or features were identified within the proposed site for development. The Early/Middle Stone Age cultural material identified is not conservation worthy. The Gariep cemeteries are situated well outside the development footprint where the grave sites are graded as IIIB and are of High Local Significance. No further mitigation is recommended with regards to these resources. Due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground-truthing and/or specialist mitigation are required. The following mitigation measures must be implemented should fossil remains or trace fossils be discovered during any phase of construction, either on the surface or exposed by excavations: - The Chance Find Protocol (Appendix A/11) must be implemented by the Environmental Control Officer (ECO) in charge of these developments. - These discoveries must be protected, and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web:	-2
18		Loss and/or damage to potential fossils and archaeological and historical sites within the construction footprint	-3		-2

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Preferred Layout					
				www.sahra.org.za) so that mitigation can be carried out by a palaeontologist (Butler 2020). - If during construction, any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. - A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.	
19	Health and Safety associated with the Irrigation Canal	Community members, especially minor children, playing in the irrigation canal resulting in injury or drownings.	-10	Although the irrigation canal has been fenced, the following mitigation measures must be implemented: - Should any section of the fence be damaged during construction, the fence must be immediately repaired; - Barriers, controlling community members' access to the irrigation canal, must be installed if no fence is present; - Guidelines stipulated in the World Health Organization's report, entitled Preventing drowning: an implementation guide, must be consulted to ensure that all applicable mitigation measures are implemented. A copy of this report can be obtained from the ECO or using the following link: file:///C:/Users/Anthony/Downloads/9789241511933-eng.pdf. - Notice boards must be erected on the fence line warning community members of the potential dangers and that accessing the irrigation canal is strictly prohibited. Information stipulated on the board must be in both English and Afrikaans.	-4

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Preferred Layout					
20	Socio-economic	Creation of short-term employment opportunities during the construction phase.	4	The construction of Gariep Housing Project will create employment and skills development opportunities during the construction phase. This will upskill local community members and lowering the high unemployment rate within the !Kheis LM and more specifically, the Gariep Township. Appoint a local representative to assist with the sourcing and appointment of suitable local people, wherever possible during the construction and operational phase.	4
21	Dust	Dust will be generated during the construction of the proposed development which may impact drivers and commuters.	-5	The proposed site for development is located 2km east of the N10 and 5.72km south east of the nearest community (Grootdrink). However, to mitigate the generation of dust impacting the existing Gariep Township, the following mitigation measures must be implemented. Moreover, the generation of dust will be temporary as the site will be worked for a limited period of time until construction is completed. Further to this: - Vehicle speed must be limited to 20km/h to reduce the amount of dust generated along the gravel roads (and especially in 20m of the drainage line which must be treated as an environmental sensitive area. - All material, being transported in the back of trucks, must be covered. - Should the mitigation measures be inadequate, water carts must be used on site along the access roads. - The applicant must comply with the National Dust Regulations (Government Notice R827, 2013) with regards to dust levels produced on site.	-3
22	Visual	Site may be not aesthetic amid natural background.	-8	*The extent of the property will not be visible to commuters utilizing the N10 (located 2km west of the site, across the Orange River) or other communities/ townships (e.g. the nearest community, Grootdrink, is located 5.72km north west of the proposed site).*	-5
23	Noise	Noise will be generated during the construction phase.	-4	Any noise generated by construction activities will be a temporary impact however, the following mitigation measures will be implemented:	-3

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Preferred Layout					
				- A complaints register must be maintained on-site. Any complaints received must be responded to and rectified accordingly. The ECO must be notified of any complaints; - All construction vehicles must be fitted with standard silencers. All silencers must be maintained. All machinery used on site must have suppressors. - Working hours must be limited to and strictly adhered to standard daylight working hours (08h00-17h00).	
24	Unsustainable sourcing of raw materials	Illegal sourcing of raw materials, such as gravel, sand, water etc. promoting illegal mining operations causing significant damage to the environment.	-8	This impact can be fully mitigated. The following mitigation measures must be implemented: - Contractors must obtain and provide proof of sustainable sourcing of materials brought to, and used on, site. These receipts must be retained on site. - The volume of material (e.g. gravel, sand, etc.) must be recorded. These records must be kept on site.	-4
OPERATION PHASE					
25	Sewage Management	Impact on the receiving environment, especially the Orange river and its tributaries, due to the inability of the current sewage disposal method (VIPs) to adequately prevent the contamination of the surrounding environment.	-12	All existing households within the Gariep Settlement are serviced by Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present. As per the Engineer's Services Report, a full-borne sewerage system is recommended. As per the Botanical Assessment (Appendix D1), the Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community.	-4

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Preferred Layout					
26		Maintenance of WWTW resulting in contamination of receiving environment.	-12	All existing households within the Gariep Settlement are serviced by Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present. As per the Engineer's Services Report, a full-borne sewerage system is recommended. As per the Botanical Assessment (Appendix D1), the Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community.	-4
27	Water supply	Increased pressure on water source for water supply	-6	As per the Services Report (Appendix D4), based on the current state of the Gariep bulk water infrastructure and calculated annual average daily demand (AADD), the following recommendations have been made: • Proposed construction of a new 12l/s mobile river pump station with a duty and standby pump; • New 125mm diameter Class 6 PVC pipeline between the river pump station and the existing potable water storage reservoir. • Upgraded Water Treatment Works capable of delivering 24m^3/h on the existing treatment works site as well as a new 360m^3 sectional steel reservoir next to the upgraded water treatment works. A new 24l/s uplifting pump station at the treatment works. • A new 250m^3 sectional steel pressure tower on the highest point to the north. • A new 200mm pipeline between the lifting pump station and the pressure tower. The following mitigation measures must be implemented: - All water pipelines, pumps, and associated equipment must be routinely checked and monitored for leakages/ malfunction. Any leakages or malfunctioning equipment must be immediately fixed/ rectified; - Water will only be used for activities factored into the AADD (Appendix D4); - No hazardous substances/ dangerous goods are to be used/ stored in close proximity to water storage areas. Any contaminated water must be disposed of as hazardous waste at	-4

Nature of Impact			Impact Assessment Ranking and Proposed Mitigation		
No.	**Aspect**	**Impact**	**Environmental Significance (without Mitigation)**	**Proposed Mitigation (i.e. Proposed mitigation to reverse/ avoid, manage or mitigate identified impacts associated with construction, operation, and decommissioning/ closure phases)**	**Environmental Significance (After Mitigation)**
Preferred Layout					
				a registered hazardous waste disposal facility. A waste receipt is required as proof of safe disposal; and - Any equipment utilized must be placed on a hardened surface (e.g. concrete surface or batching board) to prevent the contamination of exposed soil.	
28	Botanical	Encroachment of alien invasive vegetation throughout the site.	-5	Portions of the site has been heavily invaded by the alien invasive *Prosopis* tree. Although these alien trees will be removed during the construction phase, alien invasive plant species present on site must be managed.	-3
DECOMMISSIONING AND CLOSURE PHASE					
29	Waste	Demolition of infrastructure resulting in waste accumulation on-site and surrounding area.	-7	The following mitigation measures must be implemented: - All infrastructure which has been demolished must be consolidated, removed, and disposed of at a registered disposal facility. Waste receipts are required as proof of safe disposal; - The burying and/or burning of waste is strictly prohibited.	-3
30	Soil and water sources	Exposed soil becoming prone to erosion resulting in the sedimentation of the drainage line.	-6	The following mitigation measures must be implemented: - Previously transformed areas must be ripped and subsequently rehabilitated with indigenous vegetation characteristic of the Lower Gareip Alluvial (EN) and Bushman Arid Grassland (LT). Previously implemented erosion mitigation measures must remain in place.	-3