

## APPENDIX F – IMPACT ASSESSMENT

### PROJECT IMPACT ASSESSMENT, SIGNIFICANCE AND MITIGATION MEASURES SUMMARY

The following impact rating approach used by EnviroAfrica NC 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.

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<b>SIGNIFICANCE CRITERIA</b>	<b>Very High</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Negligible (very low)</b>
<b>Value</b>	<b>16</b>	<b>8</b>	<b>4</b>	<b>2</b>	<b>1</b>
<b>Probability (likelihood) (P)</b>		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. Low likelihood/unlikely for impact to occur.
<b>Extent (E)</b>	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
<b>Duration (D)</b>		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 2 - 15 years. Impact is reversible but only with on-going mitigation	Short-term / temporary The impact is expected to be temporary or last for a relatively short time with rehabilitation expected to be <2years. The impact is reversible through natural process and/or some mitigation.
<b>Magnitude (Intensity/ Severity) (M)</b>	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
<b>Receiving environment (Consequence): (RE)</b>	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

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**ENVIRONMENTAL RATING SIGNIFICANCE KEY:**

**Negative Impacts**

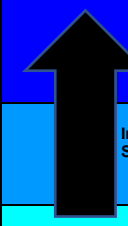
SIGNIFICANCE	RATING	Final rating score / value range
Very Significant	Very High	-11 to -16
Significant	High	-7 to <-11
	Medium	≥-5 to <-7
Insignificant	Medium Low	-4 to ≤-5
	Low	-3 to <-4
	Very Low	-1 to <-2



Increasing Significance

**Positive Impacts**

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



Increasing Significance

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

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)
<b>CONSTRUCTION PHASE</b>					
1	Biodiversity <b>Orange River Extraction Point</b>	<b>Special habitats:</b> Potential impact on special habitats (e.g. true quartz or "heuweltjies")	<b>Very Low (Negative)</b>	The site should be located next to the existing pump station and should utilise the existing disturbance footprint as much as possible.	<b>Very Low (Negative)</b>
		<b>Landuse and cover:</b> Potential impact on socio-economic activities.	<b>Very Low (Negative)</b>	The construction period might result in a temporary nuisance impact on agricultural activities.	<b>Very Low (Negative)</b>
		<b>Vegetation status:</b> Loss of vulnerable or endangered vegetation and associated habitat.	<b>Very Low (Negative)</b>	The site should be located next to the existing pump station and should utilise the existing disturbance footprint as much as possible.	<b>Very Low (Negative)</b>
		<b>Conservation priority:</b> Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	<b>Very Low (Negative)</b>	The site should be located next to the existing pump station and should aim to utilise the existing disturbance footprint as much as possible.	<b>Very Low (Negative)</b>
		<b>Connectivity:</b> Potential loss of ecological migration corridors.	<b>Very Low (Negative)</b>	The site should be located next to the existing pump station and should aim to utilise the existing disturbance footprint as much as possible.	<b>Very Low (Negative)</b>
		<b>Plant SoCC:</b> Potential impact on threatened or protected plant species.	<b>Very Low (Negative)</b>	No species of conservation concern observed	<b>Very Low (Negative)</b>
		<b>Cumulative</b> impact associated with proposed activity.	<b>Very Low (Negative)</b>	<ul style="list-style-type: none"> <li>The "Search &amp; Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).</li> </ul>	<b>Very Low (Negative)</b>

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				<ul style="list-style-type: none"> <li>○ All <i>Aloe</i> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> <li>● A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>● A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>● All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>● Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>● An integrated waste management approach must be implemented during construction.</li> <li>● Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.</li> </ul>	
2	Biodiversity  Lennertsville WTW	<b>Landuse and cover:</b> Potential impact on socio-economic activities.	<b>Medium Low (Negative)</b>	The preferred location (to the north of the existing WTW) will avoid the impact on the dwellings and NCNCA protected species.	<b>Very Low (Negative)</b>
		<b>Vegetation status:</b> Loss of vulnerable or endangered vegetation and associated habitat.	<b>Very Low (Negative)</b>	The preferred location (to the north) will minimise the impact on natural veld and SoCC.	<b>Very Low (Negative)</b>

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		<b>Conservation priority:</b> Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	Low (Negative)	The preferred location (to the north of the existing WTW) will minimise impact on remaining natural veld.	Very Low (Negative)
		<b>Connectivity:</b> Potential loss of ecological migration corridors.	Low (Negative)	The preferred location to the north will minimise the accumulative impact on connectivity slightly.	Very Low (Negative)
		<b>Plant SoCC:</b> Potential impact on threatened or protected plant species.	Low (Negative)	The northern option will avoid the impact on these species, otherwise implement the mitigation measures in Table 10 of the Biodiversity and Terrestrial Compliance statement (Appendix D3).	Very Low (Negative)
		<b>Cumulative</b> impact associated with proposed activity.	Medium (Negative)	<ul style="list-style-type: none"> <li>• The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <i>Aloe</i> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>• A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>• A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> </ul> </li> </ul>	Very Low (Negative)

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				<ul style="list-style-type: none"> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> <li>● Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>● An integrated waste management approach must be implemented during construction.</li> </ul> <p>Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.</p>	
3	Biodiversity <b>R27 Lennertsville to Kenhardt</b>	<b>Landuse and cover:</b> Potential impact on socio-economic activities.	<b>Very Low (Negative)</b>	<ul style="list-style-type: none"> <li>● The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <b><i>Aloe</i></b> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <b><i>Euphorbia braunsii</i> &amp; <i>E. spinea</i></b> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>● A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>● A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>● All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>● Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>● An integrated waste management approach must be implemented during construction.</li> </ul>	<b>Very Low (Negative)</b>

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				Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.	
		<b>Vegetation status:</b> Loss of vulnerable or endangered vegetation and associated habitat.	<b>Low (Negative)</b>	<ul style="list-style-type: none"> <li>• The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <b><i>Aloe</i></b> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <b><i>Euphorbia braunsii &amp; E. spinea</i></b> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>• A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>• A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>• Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>• An integrated waste management approach must be implemented during construction.</li> <li>• Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.</li> </ul> <p>(Environmental oversight during planning and construction, protection of NFA protected trees).</p>	<b>Very Low (Negative)</b>



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		<p><b>Conservation priority:</b> Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.</p>	Low (Negative)	<ul style="list-style-type: none"> <li>• The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <i>Aloe</i> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>• A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>• A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>• Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>• An integrated waste management approach must be implemented during construction.</li> <li>• Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.</li> </ul> <p>(Environmental oversight during planning and construction, protection of NFA protected trees).</p>	Very Low (Negative)
		<p><b>Connectivity:</b> Potential loss of ecological migration corridors.</p>	Very Low (Negative)	<ul style="list-style-type: none"> <li>• The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).</li> </ul>	Very Low (Negative)

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		Plant SoCC: Potential impact on threatened or protected plant species.	<b>Medium (Negative)</b>	<ul style="list-style-type: none"> <li>● The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <i>Aloe</i> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> </ul> </li> </ul>	<b>Low (Negative)</b>

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		Cumulative impact associated with proposed activity.	Medium (Negative)	<ul style="list-style-type: none"> <li>• The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <i>Aloe</i> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>• A NFA Permit application must be obtained should any of the protected trees be impacted.</li> </ul>	Low (Negative)

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4	Biodiversity  The road reserve from Soafskolk to Farm Uitkyk	<b>Watercourses &amp; Wetlands:</b> Potential impact on natural water resources and it's ecological support areas.	Low (Negative)	There is no mitigation apart from staying next to the existing road corridor and minimising the construction footprint.	Low (Negative)
		<b>Landuse and cover:</b> Potential impact on socio-economic activities.	Very Low (Negative)	<ul style="list-style-type: none"> <li>The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>All <i>Aloe</i> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li><i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>A NFA Permit application must be obtained should any of the protected trees be impacted.</li> </ul>	Very Low (Negative)

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		<p><b>Vegetation status:</b> Loss of vulnerable or endangered vegetation and associated habitat.</p>	<p><b>Very Low (Negative)</b></p>	<ul style="list-style-type: none"> <li>The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>All <b><i>Aloe</i></b> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li><b><i>Euphorbia braunsii &amp; E. spinea</i></b> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts</li> </ul> </li> </ul>	<p><b>Very Low (Negative)</b></p>

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				<p>(e.g., spreading of the AIP due to incorrect eradication methods);</p> <ul style="list-style-type: none"> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> <li>• Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>• An integrated waste management approach must be implemented during construction.</li> <li>• Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.</li> </ul>	
		<p><b>Conservation priority:</b> Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.</p>	<p><b>Low (Negative)</b></p>	<ul style="list-style-type: none"> <li>• The "Search &amp; Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <i>Aloe</i> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>• A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>• A Northern Cape Nature Conservation Act permit must be obtained for the "Search &amp; Rescue" and other impacts on the protected species listed in Table 10.</li> <li>• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>• Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>• An integrated waste management approach must be implemented during construction.</li> </ul>	<p><b>Low (Negative)</b></p>


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				<ul style="list-style-type: none"> <li>Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of larger indigenous trees).</li> </ul>	
		<b>Connectivity:</b> Potential loss of ecological migration corridors.	<b>Very Low (Negative)</b>	<ul style="list-style-type: none"> <li>The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>All <b><i>Aloe</i></b> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li><b><i>Euphorbia braunsii</i> &amp; <i>E. spinea</i></b> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>An integrated waste management approach must be implemented during construction.</li> <li>Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of larger indigenous trees).</li> </ul>	<b>Very Low (Negative)</b>



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		<b>Plant SoCC:</b> Potential impact on threatened or protected plant species.	<b>Low (Negative)</b>	<ul style="list-style-type: none"> <li>• The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <b><i>Aloe</i></b> species encountered within the footprint area, must be replanted outside the footprint area.</li> <li>○ <b><i>Euphorbia braunsii</i> &amp; <i>E. spinea</i></b> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> </ul> </li> <li>• A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>• A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>• Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>• An integrated waste management approach must be implemented during construction.</li> <li>• Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.</li> </ul> (Environmental oversight during planning and construction, protection of larger indigenous trees).	<b>Very Low (Negative)</b>
		<b>Cumulative</b> impact associated with proposed activity.	<b>Low (Negative)</b>	<ul style="list-style-type: none"> <li>• The “Search &amp; Rescue” recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).                             <ul style="list-style-type: none"> <li>○ All <b><i>Aloe</i></b> species encountered within the footprint area, must be replanted outside the footprint area.</li> </ul> </li> </ul>	<b>Low (Negative)</b>



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				<ul style="list-style-type: none"> <li>○ <i>Euphorbia braunsii</i> &amp; <i>E. spinea</i> individuals encountered within the footprint area must be replanted outside the footprint area.</li> <li>○ Search &amp; Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.</li> <li>● A NFA Permit application must be obtained should any of the protected trees be impacted.</li> <li>● A Northern Cape Nature Conservation Act permit must be obtained for the “Search &amp; Rescue” and other impacts on the protected species listed in Table 10.</li> <li>● All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.                             <ul style="list-style-type: none"> <li>○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);</li> <li>○ Care must be taken to dispose of alien plant material responsibly.</li> </ul> </li> <li>● Indiscriminate clearing of any area outside of these footprints may not be allowed.</li> <li>● An integrated waste management approach must be implemented during construction.</li> <li>● Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.</li> </ul> <p>(Environmental oversight during planning and construction, protection of larger indigenous trees).</p>	
5	Avifauna	Destruction of natural vegetation and faunal habitat	<b>Medium (Negative)</b>	Crossing the Hartbees River floodplain in a currently undisturbed area should be avoided. If technically feasible, the suggested route change shown below (blue lines) must be considered. This suggested route follows existing tracks that are already disturbed, rather than disturbing the floodplain in new areas	<b>Low (Negative)</b>

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				 <p>Construction activities should commence during the dry winter months as far as possible to minimise the impacts on breeding fauna</p>	
6	Freshwater	<p>Trenching of the new pipeline, washing of soil down the drainage line during storm events</p> <p>Trenching of the new pipeline through the Hartbees River, washing sediments down the Hartbees River when it rains</p> <p>Trenching of the new pipeline along the banks of the pan, washing of sediments into the pan</p>	<b>High (Negative)</b>	<p>Do not disturb any land outside of designated trenching area in the reserve of existing roads</p> <p>Construct outside of rainy season</p> <p>Ensure that the new pipeline is trenched deep enough as appropriate for various water ways.</p> <p>Carefully replace backfill in layers and compact to resemble permeability prior to construction</p> <p>Level and landscape wherever the pipeline is trenched</p> <p>Remove divots and bumps as not to encourage deposition or erosion</p> <p>Take measures to ensure that the pipeline is not denuded in drainage lines and the river.</p>	<b>Low (Negative)</b>

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7	Freshwater (Rehabilitation following construction)	Destruction of stormwater infrastructure in the road reserve such as walls, berms, gabions and reno mattresses	High (Negative)	Repair the stormwater infrastructure in the road reserve to effectively prevent erosion and excessive runoff.	Low (Negative)
8	Heritage and cultural resources identified	Field Rating IVB (KTE-037, 038, 039, 041, 006)	Medium (Negative)	<ul style="list-style-type: none"> <li>No further mitigation is recommended since KTE-037, 038, 039, and 041 are outside the proposed footprint.</li> <li>A 100 m buffer/safety zone is recommended to negate the negative impact on the British campsite (KTE-006). The buffer/safety zones implemented should be clearly demarcated during the project's construction phase and completely avoided by personnel and equipment.</li> </ul>	Low (Negative)
		Field Rating IVA (KTE-002, 003, 004, 005, 033) (Appendix D5)	Medium (Negative)	A 200 m buffer/safety zone is recommended to negate the negative impact on these resources. The buffer/safety zones implemented should be clearly demarcated during the project's construction phase and wholly avoided by personnel and equipment.	Low (Negative)
		Graves with Field Rating IIIA (KTE-011, 014) (Appendix D5)	Medium (Negative)	It is recommended that a buffer/safety zone of 100 m should be implemented around KTE-011 and a 50 m buffer/safety zone around KTE-014. In addition, KTE-014 should be fenced off. The buffer/safety zones implemented should be clearly demarcated during the project's construction phase and wholly avoided by personnel and equipment.	Low (Negative)
		Loss of fossil heritage by destruction, movement or sealing of fossil heritage in Or below the earth's surface	Medium (Negative)	Although no further mitigation is recommended, it is recommended that if Palaeontological Heritage is uncovered during surface clearing and excavations, the Chance Find Protocol attached should be implemented immediately (Butler 2024).	Low (Negative)

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		Cumulative Impact	Medium (Negative)	Refer to above mentioned Heritage mitigation.	Low (Negative)
9	Palaeontological	Impacts associated with construction phase	High (Negative)	<p>It is the responsibility of the project's Environmental Site Officer (ESO) or site manager to train the workers and foremen on what to do if a fossil is accidentally discovered. In the absence of the ESO, a member of staff must be designated to be accountable for the effective application of the chance discovery protocol so that the conservation of fossil material is not jeopardized.</p> <p>Chance Find Procedure:</p> <ul style="list-style-type: none"> <li>• If a chance find is made, the person responsible for the find must immediately stop working, and all work in the immediate vicinity of the find must stop as well.</li> <li>• The individual who discovered the item must immediately notify his or her direct supervisor, who must then notify his or her management and the ESO or site manager. The ESO or site manager must notify the relevant Heritage Agency (South African Heritage Resources Agency, SAHRA) of the discovery. (Contact information: SAHRA, 111 Harrington Street, Cape Town, South Africa. PO Box 4637, Cape Town 8000, South Africa. Fax: +27 (0)21 462 4509. Tel: 021 462 4502. Web address: www.sahra.org.za). Photographs of the find from various perspectives, as well as GPS coordinates, must be submitted to the Heritage Agency.</li> <li>• Within 24 hours of the discovery, a preliminary report must be sent to the Heritage Agency, which must include the following: 1) the date of finding; 2) a description of the discovery; and 3) a description of the fossil and its context (depth and position of the fossil), as well as GPS coordinates.</li> <li>• Photographs of the discovery (the more the merrier) must be of high quality, in focus, and accompanied by a scale. Photographs of the vertical part (side) where the fossil was discovered are also required.</li> <li>• Upon receipt of the preliminary report, the Heritage Agency will notify the ESO (or site manager) whether a palaeontologist rescue excavation or collection is required.</li> </ul>	Low (Negative)

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				<ul style="list-style-type: none"> <li>The place must be guarded to prevent future damage. There should be no attempt to remove material from their environment. Stabilize the exposed items and cover them with a plastic sheet or sand bags. The Heritage organization will also be able to advise on the best way to protect the find.</li> <li>If the fossil cannot be stabilized, the ESO (site manager) may carefully collect the fossil.</li> <li>Once the Heritage Agency has received the written authorization, the developer may continue with the development on the affected area.</li> <li>Fossil finds must be placed in tissue paper and in an appropriate box while necessary care must be taken to remove any fossil material from the rescue site.</li> </ul>	
10	Socio-economic	Employment of Workforce and Contractors.	<b>Medium (Positive)</b>	<p>Enhancement Measures: To enhance the local employment, skills development and business opportunities associated with the construction phase, the following measures should be implemented:</p> <ul style="list-style-type: none"> <li>The developers be committed to involving and benefiting the communities surrounding the development, contributing to their development and growth.</li> <li>It is recommended to conduct structured and proactive engagement sessions within the municipal district, to expose local small, micro, and medium enterprises which will benefit from the proposed development.</li> <li>Training and skills development programmes should be offered to employees of the development prior to the commencement of the construction phase.</li> <li>The communities which are most in need of employment on a local level should be considered for employment before outsourcing.</li> </ul> <p>Engage proactively with local stakeholders and implement transparent hiring practices to ensure equitable distribution of employment opportunities.</p>	<b>Medium (Positive)</b>
		Economic Multiplier Effects.	<b>Medium (Positive)</b>	<p>Enhancement Measures:</p> <ul style="list-style-type: none"> <li>Preference is given to suppliers that are local to the operation where the service will be consumed.</li> </ul>	<b>Medium (Positive)</b>

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				<ul style="list-style-type: none"> <li>Establishing liaison and communication structures with the district and local government structures.</li> <li>Liaise with the local governmental structures and municipal authorities in the labour-sending communities to ensure that group development initiatives are integrated into the economic and development plans of those areas.</li> <li>The continuous review of the economic development of the Project during the implementation process will ensure that the Project does not become static but is revised in terms of changing needs and also to ensure sustainability.</li> <li>Prior to the start of the construction contractor procurement, a database of local companies, specifically Historically Disadvantaged (HD) companies, that qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies, etc) should be identified and informed about the tender process and invited to bid on Project-related work, if applicable.</li> <li>Engage with local authorities and business organisations to investigate the feasibility of obtaining construction materials, goods, and products from local suppliers, where possible.</li> </ul>	
		Influx of Jobseekers and Change in Population.	<b>Medium (Negative)</b>	<ul style="list-style-type: none"> <li>A Community Liaison Officer should be appointed.</li> <li>A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.</li> <li>Regular community meetings and information campaigns to manage expectations regarding employment opportunities, fostering understanding between local residents and incoming job seekers.</li> <li>Prioritising local hiring to reduce the influx of external job seekers and support community development.</li> <li>Implementing training programs for local residents to enhance employability in the project, thereby reducing reliance on external semi-skilled and unskilled labour.</li> <li>Collaborating with local authorities to strengthen infrastructure and service provision (like healthcare, education, and public utilities) to accommodate population growth and increased demand.</li> <li>Establishing monitoring systems to track socio-economic impacts and setting up conflict resolution platforms to address any emerging issues between local and newcomer communities.</li> </ul>	<b>Low (Negative)</b>



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				<ul style="list-style-type: none"> <li>Working with local law enforcement to implement crime prevention strategies and ensure public safety.</li> </ul>	
		Safety and Security Impacts.	<b>Medium (Negative)</b>	<ul style="list-style-type: none"> <li>Conduct thorough safety and security training for all construction workers and staff involved in the Project to reinforce the importance of adhering to safety protocols and secure practices.</li> <li>Enhance site security measures, including installing surveillance cameras, lighting, and fencing around the construction areas to deter unauthorized access and reduce theft.</li> <li>Implement strict access controls, requiring identification checks for anyone entering the construction site to ensure only authorized personnel are on-site.</li> <li>Develop and distribute safety guidelines to local communities, informing them of the construction activities, potential hazards, and safety precautions to minimize accidents and misunderstandings.</li> <li>Appoint a Community Liaison Officer to act as a bridge between the Project and the community, addressing any safety and security concerns that may arise promptly.</li> <li>Provide adequate firefighting equipment on-site and conduct regular training sessions on fire safety and emergency response for the construction team.</li> </ul>	<b>Low (Negative)</b>
		Increased Pressure on Local Services / Resources	<b>Medium (Negative)</b>	<ul style="list-style-type: none"> <li>Appointment of a Community Liaison Officer to facilitate communication between the Project and the community, ensuring any concerns related to increased demand on services are promptly addressed.</li> <li>Strategic Planning with local authorities to anticipate service needs and develop plans to enhance local services in preparation for the construction phase.</li> <li>Investment in local infrastructure where feasible, such as upgrading roads or utilities, to benefit both the Project and the community, thereby reducing the Project's impact on local services.</li> <li>Establish temporary facilities, such as mobile healthcare units or temporary housing, to accommodate the needs of the construction workforce without overly burdening local services.</li> <li>Implement traffic management plans to minimize the impact of construction-related vehicle movements on local transportation systems, reducing congestion and potential safety hazards.</li> </ul>	<b>Low (Negative)</b>
		Increased Probability of Fire Risk	<b>Medium (Negative)</b>	<ul style="list-style-type: none"> <li>Ensure training is given to employees on the risks of fires.</li> <li>Ensure that firefighting equipment is present and working.</li> <li>No fires are to be made on site for any reason.</li> </ul>	<b>Low (Negative)</b>

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		Nuisance Impacts (Noise and Dust)	Medium (Negative)	<ul style="list-style-type: none"> <li>No hunting or cooking of any animals or plants in or around the development footprint.</li> <li>During construction, care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the farms and residential areas nearby. Plant equipment such as generators, compressors, concrete mixers, and vehicles should be kept in good working order and, where possible, equipped with effective exhaust mufflers.</li> <li>The movement of construction vehicles on the site should be confined to agreed access road/s.</li> <li>Heavy vehicle movement during the construction phase should be timed (where possible) to avoid times of the week, such as weekends, when the volume of traffic on the access roads may be higher.</li> <li>Dust suppression measures must be implemented on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.</li> </ul>	Low (Negative)
11	Socio-economic (Cumulative)	An increase in employment opportunities, skills development, and business opportunities	Medium (Positive)	<p>Enhancement Measures:</p> <ul style="list-style-type: none"> <li>Adopt local employment policies to ensure that job creation benefits the community surrounding the Proposed Project.</li> <li>Utilize local service providers for construction, maintenance, and operational needs to enhance business opportunities in the area.</li> <li>Implement skills development programs in partnership with local educational institutions and technical training centers to prepare the local workforce for opportunities arising from the Project and other similar developments in the region.</li> </ul>	Medium (Positive)
		Negative impacts and change to the local economy with an in-migration of labourers, businesses, and jobseekers	Negative (Low)	<ul style="list-style-type: none"> <li>Develop and enforce a local recruitment policy to prioritize hiring from the surrounding communities, thereby reducing the need for extensive in-migration.</li> <li>Collaborate with local government agencies and community organizations to align the Project's development with the local area's needs, ensuring that service provisions meet the requirements of both existing residents and newcomers.</li> <li>Establish joint ventures or partnerships with community organizations, potentially through Trusts, to provide tangible benefits to local communities, including employment opportunities and essential services.</li> <li>Formulate and distribute a clear recruitment protocol in partnership with the local municipality and community leaders, ensuring transparent communication about employment processes.</li> </ul>	Negative (Low)



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12	Visual	<ul style="list-style-type: none"> <li>Alteration of Landscape Character</li> <li>Local Land Use</li> <li>Dust and Construction Impact</li> <li>Nighttime lighting</li> </ul>	Low (Negative)	<ul style="list-style-type: none"> <li>Comprehensive restoration plans that utilise native vegetation for recovery post-construction, alongside sensitive siting and underground placement of the pipeline to minimise visibility.</li> <li>Construction management practices are rigorously implemented, featuring dust suppression techniques and limiting operations to daylight hours to reduce disturbances. Controlled lighting is designed to minimise light pollution, and community engagement ensures that the project aligns with local aesthetic values. All temporary structures and debris are promptly removed post-construction to restore the site's visual integrity.</li> </ul>	Low (Negative)
<b>OPERATIONAL PHASE</b>					
13	Avifauna	Destruction of natural vegetation and faunal habitat	Low (Negative)	If technically feasible, the suggested route change shown above (blue lines) must be considered. This suggested route follows existing tracks that are already disturbed, rather than disturbing the floodplain in new areas. This will help avoid repeating impacts during the operational phase whenever repairs or maintenance is required	Very Low (Negative)
14	Freshwater	Operation of new pipeline	Medium (Low)	<p>Budget for the maintenance of the pipeline and the road reserve</p> <p>Inspect according to schedule and repair if leaking, prevent denuding of pipeline, cover when denuded.</p> <p>Maintain and repair stormwater infrastructure if required</p>	Low (Negative)
15	Socio-economic	Direct and Indirect Employment Opportunities	Medium (Positive)	<p>Enhancement Measures:</p> <ul style="list-style-type: none"> <li>Local Hiring: Prioritise hiring from the local community for all available positions. This will ensure that the benefits of employment are directly felt within the local community.</li> <li>Skills Transfer: In cases where highly skilled expertise is required, provide provisions for skills transfer. This will facilitate knowledge sharing within the local workforce and enhance the overall skill level of the community.</li> </ul>	Medium (Positive)

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				<ul style="list-style-type: none"> <li>Support for Local Businesses: Encourage the involvement of local businesses in providing materials, goods, and services during the operational phase of the project. This can stimulate entrepreneurial growth and create indirect job opportunities.</li> <li>Community Engagement: Maintain open lines of communication with the local community through the development's existing community liaison officer. This will ensure that job opportunities are communicated effectively and that local residents are given fair consideration in the hiring process.</li> <li>Fair Labour Practices: Align the project with the development's socio-economic labour plan to ensure fair labour practices and safe working conditions for all workers.</li> </ul>	
		Economic Multiplier Effects	Medium (Positive)	<p>Enhancement Measures:</p> <ul style="list-style-type: none"> <li>Local Supplier Engagement and Development: Actively engage with local suppliers to understand their capabilities and limitations. Offer support and development programs to help them meet the project's needs. This could include training in specific skills, quality standards, or business management.</li> <li>Community Liaison Officers (CLOs): Employ CLOs to facilitate communication between the project and local businesses, ensuring that the needs of both are met and that opportunities are fairly distributed</li> <li>Investment in Local Capacity Building: Invest in local infrastructure and capacity building to enable local businesses to scale up and meet the operational or maintenance demands of the project, where feasible. This could include financial support, technology transfer, or infrastructure improvements.</li> <li>Long-term Community Development Plans: Work with local authorities and community groups to develop and implement long-term economic development plans that align with the project's long-term presence and potential for economic stimulation.</li> <li>Transparent Procurement Processes: Establish transparent and fair procurement processes that give local businesses a fair chance to compete for services required such as maintenance contracts, ensuring equitable opportunity distribution.</li> </ul>	Medium (Positive)

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		Enhanced Water Supply and Security	<b>Medium (Positive)</b>	Enhancement Measures: <ul style="list-style-type: none"> <li>• Infrastructure Upgrades: Implement advanced water treatment and monitoring technologies to ensure water quality and sustainability.</li> <li>• Stakeholder Engagement: Work closely with local communities and stakeholders to manage water resources effectively and address concerns related to water distribution and access.</li> <li>• Water Conservation Initiatives: Promote water conservation through community education programs and the introduction of water-saving technologies in homes and industries.</li> </ul>	<b>Medium (Positive)</b>