

APPENDIX F: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

The following parameters are used to describe the impact / issues in this assessment:

1. **Nature**

A brief written statement of the environmental aspect being impacted upon by a particular action or activity.

2. **Extent**

The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact.

- **Site (1)** – Within the construction site.
- **Local (2)** – Within a radius of 2 km of the construction site.
- **Regional (3)** – the scale applies to impacts on a provincial level and parts of neighbouring provinces.
- **National (4)** – the scale applies to impacts that will affect the whole South Africa.

3. **Duration**

Indicates what the lifetime of the impact will be.

- **Short-term (1)** – less than 5 years.
- **Medium-term (2)** – between 5 and 15 years.
- **Long-term (3)** – between 15 and 30 years.
- **Permanent (4)** – over 30 years and resulting in a permanent and lasting change that will always be there.

4. **Intensity**

Describes whether an impact is destructive or benign.

- **Very High (4)** - Natural, cultural and social functions and processes are altered to extent that they permanently cease.
- **High (3)** - Natural, cultural and social functions and processes are altered to extent that they temporarily cease.
- **Moderate (2)** - Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.
- **Low (1)** - Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.

5. **Probability**

Describes the likelihood of an impact actually occurring.

- **Improbable (1)** - Likelihood of the impact materialising is very low.
- **Possible (2)** - The impact may occur.
- **Highly Probable (3)** - Most likely that the impact will occur.
- **Definite (4)** - Impact will certainly occur.

6. **Cumulative**

In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

7. Significance

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Low impact (4 – 6 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
Medium impact (7 – 9 points)	Mitigation is possible with additional design and construction inputs.
High impact (10 – 12 points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very High impact (13 – 16 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” (negative) is likely to be a fatal flaw.
Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.
Neutral (I)	Impact is neither beneficial nor adverse.

1.1 Impacts that may result from the planning and design phase

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
Alternative 1 (preferred alternative)				
Planning and design phase	Direct impacts:			
	Habitat Destruction	Extent: Site Specific (-1) Duration: Long-term (-3) Intensity: Moderate (-2) Probability of occurrence: Possible (-2) Significance Rating: Medium (-8)	<i>Limit this impact to the footprint and immediate support areas only; Avoid indiscriminate destruction of habitat; Make alignment shifts to accommodate sensitive habitat features in the design and planning phase.</i>	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of occurrence: Improbable (-1) Significance Rating: Low (-5)
	Indirect impacts:			
	Socio-economic	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) Significance Rating: Medium (+10)	<i>The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs.</i>	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) Significance Rating: Medium (+10)
Cumulative impacts:				
	Wetlands	Extent: Local (-2) Duration: Medium-term (-2) Intensity: Moderate (-2)	Construction to be guided by the EMP and the mitigation measures stipulated in this report.	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1)

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		Probability of Occurrence: Possible (-2) <u>Significance Rating:</u> <u>Medium (-8)</u>		Probability of Occurrence: Possible (-2) <u>Significance Rating:</u> <u>Medium (-6)</u>
Alternative 2				
Planning and design phase	Direct impacts:			
	Habitat Destruction	Extent: Site Specific (-1) Duration: Long-term (-3) Intensity: Moderate (-2) Probability of occurrence: Likely (-3) <u>Significance Rating: Medium (-9)</u>	Limit this impact to the footprint and immediate support areas only; Avoid indiscriminate destruction of habitat; Make alignment shifts to accommodate sensitive habitat features in the design and planning phase.	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of occurrence: Probable (-2) <u>Significance Rating: Low (-6)</u>
	Indirect impacts:			
	Socio-economic	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) <u>Significance Rating:</u> <u>Medium (+10)</u>	The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs.	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) <u>Significance Rating:</u> <u>Medium (+10)</u>
	Cumulative impacts:			
Wetlands	Extent: Local (-2) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability of Occurrence: Possible (-2) <u>Significance Rating:</u> <u>Medium (-8)</u>	Construction to be guided by the EMPr and the mitigation measures stipulated in this report.	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of Occurrence: Possible (-2) <u>Significance Rating:</u> <u>Medium (-6)</u>	
Alternative 3				
No-go option				

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
Direct Impacts				
<ul style="list-style-type: none"> None of the negative impacts listed above will occur. Cost escalation for infrastructure to CSP Plant makes it unviable to construct approved pipeline. Lack of water to the CSP Plant (under construction) will lead to delays in completion and operation of the facility. 				
Indirect Impacts				
<ul style="list-style-type: none"> Loss of employment opportunities and socio-economic benefits. 				
Cumulative Impacts				
<ul style="list-style-type: none"> Financial loss to the region. 				

SUMMARY OF IMPACTS AND AVERAGE POINTS ALLOCATED TO EACH SITE ALTERNATIVE DURING THE PLANNING AND DESIGN PHASE

IMPACTS	Site Alternative 1 – Without Mitigation	Site Alternative 1 – With Mitigation
Direct Impacts		
Habitat Destruction	-8	-5
Average Total	-8	-5
Indirect Impacts		
Socio Economic	+10	+10
Average Total	+10	+10
Cumulative Impacts		
Wetlands	-8	-6

Average	-8	-6
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IMPACTS	Site Alternative 2 – Without Mitigation	Site Alternative 2 – With Mitigation
Direct Impacts		
Habitat Destruction	-9	-6
Average Total	-9	-6
Indirect Impacts		
Socio Economic	+10	+10
Average Total	+10	+10
Cumulative Impacts		
Wetlands	-8	-6
Average	-8	-6

1.2 Impacts that may result from the construction phase

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
Alternative 1 (preferred alternative)				
Construction phase	Direct impacts:			
	Habitat Destruction	Extent: Local (-2) Duration: Long-term (-4) Intensity: Low (-2) Probability of occurrence: Likely (-3) Significance Rating: High (-11)	<i>Limit this impact to the footprint and immediate support areas only; Avoid indiscriminate destruction of habitat; Make alignment shifts to accommodate sensitive habitat features.</i>	Extent: Site (-1) Duration: Short-term (-2) Intensity: Moderate (-2) Probability of occurrence: Possible (-2) Significance Rating: Medium (-7)
	Biodiversity impacts	Extent: Site (-1) Duration: Long-term (-3) Intensity: Moderate (-2) Probability of occurrence: Possible (-2) Significance Rating: Medium (-8)	<i>Limit this impact to the footprint and immediate support areas only; Avoid indiscriminate destruction of habitat; If any RDL species are noted, they must be removed as part of a rescue and relocation plan; permission needs to be sought in order to remove/destroy protected floral species. Species such as Acacia mellifera, Acacia tortilis, or Dichrostachys cinerea should not be utilised for revegetation purposes in the early stages of veld succession (reclamation). Collection of firewood should not be allowed and fires should be prohibited unless designated areas can be provided for. Indiscriminate destruction of flora must be avoided, which is pertinent particularly to protected tree species within the area of the proposed development.</i>	Extent: Site (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of occurrence: Improbable (-1) Significance Rating: Low (-5)
Soil impacts	Extent: Local (-2) Duration: Long-term (-4)	<i>Soil erosion is readily mitigated for by the implementation of geotextiles and silt fencing on areas of steeper slopes,</i>	Extent: Local (-2) Duration: Short-term (-2)	

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		Intensity: Medium (-3) Probability of occurrence: Likely (-3) <u>Significance Rating: High (-12)</u>	<i>especially near aquatic habitats. Movement of heavy vehicles to be restricted to designated access points only. Upon completion, the impacted areas can be ripped to loosen the soils and enhance revegetation. Earthmoving and construction equipment should be serviced regularly to avoid fuel and oils leaks; Accidental spillages must be immediately reported to the ECO and clean up procedures implemented immediately. This would include the removal of the contaminated soils, which should be taken to a registered disposal facility.</i>	Intensity: Low (-2) Probability of occurrence: Improbable (-1) <u>Significance Rating: Medium (-7)</u>
	Impacts on aquatic biodiversity	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) <u>Significance Rating: High (-14)</u>	<i>Limit this impact to the footprint and immediate support areas only and avoid indiscriminate destruction of habitat.</i>	Extent: Local (-2) Duration: Short-term (-2) Intensity: Low (-2) Probability of occurrence: Improbable (-1) <u>Significance Rating: Medium (-7)</u>
	Water quality impacts	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) <u>Significance Rating: High (-14)</u>	<i>Equipment must be serviced and well maintained. Servicing of equipment should not take place at the edge of the watercourse but within designated areas only.</i>	Extent: Site specific (-1) Duration: Very Short (-1) Intensity: Very Low (-1) Probability of occurrence: Probable (-2) <u>Significance Rating: Low (-5)</u>
	Wetland impacts	Extent: Local (-2) Duration: Long Term (-3) Intensity: Moderate (-2) Probability of occurrence: Probable (-2) <u>Significance Rating: Medium (-9)</u>	<i>Construction to be monitored by an ECO according to the stipulations of the EMPr. No batching or chemical / fuel storage areas to be located within any surface water feature or within 100m of a surface water feature. Clearing of vegetation to be limited to the construction footprint. No temporary construction accesses (other than the construction right of way) to be constructed through any surface water feature and no machinery to enter any wetland unless authorised under the EMPr by the ECO</i>	Extent: Site Specific (-1) Duration: Short-term (-1) Intensity: Low (-1) Probability of occurrence: Probable (-2) <u>Significance Rating: Low (-5)</u>

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
			<p>as part of a construction activity.</p> <p>Watercourse channels and other parts of the surface water feature must be restored to as close a pre-construction state as possible.</p>	
	Archaeological resources	<p>Extent: Site specific (-1)</p> <p>Duration: Permanent (-5)</p> <p>Intensity: Low (-2)</p> <p>Probability of occurrence: Probable (-2)</p> <p><u>Significance Rating: Medium (-10)</u></p>	<p>No major features were noted during the field investigation. Impacts on what archaeological resources do occur may be limited by restricting the footprint of the development as far as possible, avoiding indiscriminate surface clearing/disturbance.</p>	<p>Extent: Site specific (-1)</p> <p>Duration: Permanent (-5)</p> <p>Intensity: Low (-2)</p> <p>Probability of occurrence: Improbable (-1)</p> <p><u>Significance Rating: Medium (-9)</u></p>
	Waste	<p>Extent: Local (-2)</p> <p>Duration: Medium (-2)</p> <p>Intensity: Moderate (-2)</p> <p>Probability of occurrence: Possible (-2)</p> <p><u>Significance Rating: Medium (-8)</u></p>	<p>Where possible, construction waste on site must be reused or recycled.</p> <p>Disposal of waste must be in accordance with relevant legislative requirements.</p> <p>The Contractor must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation.</p> <p>Burning of waste material will not be permitted.</p> <p>Further detailed mitigation measures are included in the EMPr.</p>	<p>Extent: Local (-2)</p> <p>Duration: Short-term (-1)</p> <p>Intensity: Low (-1)</p> <p>Probability of occurrence: Possible (-2)</p> <p><u>Significance Rating: Medium (-6)</u></p>
	Dust	<p>Extent: Local (-2)</p> <p>Duration: Medium (-2)</p> <p>Intensity: Moderate (-2)</p> <p>Probability of occurrence: Possible (-2)</p> <p><u>Significance Rating: Medium (-8)</u></p>	<p>Frequent and effective dust-suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off.</p>	<p>Extent: Local (-2)</p> <p>Duration: Short-term (-1)</p> <p>Intensity: Low (-1)</p> <p>Probability of occurrence: Possible (-2)</p> <p><u>Significance Rating: Medium (-6)</u></p>
	Noise	<p>Extent: Local (-2)</p> <p>Duration: Medium (-2)</p> <p>Intensity: Moderate (-2)</p> <p>Probability of occurrence: Possible (-2)</p>	<p>Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities.</p> <p>Provide all equipment with standard silencers. Maintain silencer units on vehicles and equipment in good working order.</p>	<p>Extent: Local (-2)</p> <p>Duration: Short-term (-1)</p> <p>Intensity: Low (-1)</p> <p>Probability of Occurrence: Possible (-2)</p>

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		<u>Significance Rating: Medium (-8)</u>	Construction staff working in areas where the 8-hour ambient noise levels exceed 60 dBA should wear ear protection equipment.	<u>Significance Rating: Medium (-6)</u>
	Traffic	Extent: Site (-1) Duration: Long-term (-4) Intensity: High (-3) Probability of Occurrence: Highly Probable (-3) <u>Significance Rating: High (-11)</u>	Construction vehicles to avoid blocking off the farm access roads. The Contractor must provide alternative access around construction work areas.	Extent: Local (-2) Duration: Medium (-2) Intensity: Moderate (-2) Probability of Occurrence: Possible (-2) <u>Significance Rating: Medium (-8)</u>
Indirect impacts:				
	Socio-economic	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) <u>Significance Rating: Medium (+10)</u>	<i>The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs.</i> <i>Jobs for the maintenance of infrastructure and services will be created following the completion of the development. These jobs might be made available to existing labour there creating long term employment.</i>	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) <u>Significance Rating: Medium (+10)</u>
Cumulative impacts:				
	Wetlands	Extent: Local (-2) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability of Occurrence: Possible (-2) <u>Significance Rating: Medium (-8)</u>	Construction to be guided by the EMPr and the mitigation measures stipulated in this report. Construction to be monitored by an ECO according to the stipulations of the EMPr. No batching or chemical / fuel storage areas to be located within 50m of the area of residual hydromorphic soils or the stream and associated riparian corridor. Construction-phase stormwater controls to be implemented along the stretch of the construction servitude adjacent to the area of residual hydromorphic soils, and around all stockpiles, including those placed on site.	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of Occurrence: Possible (-2) <u>Significance Rating: Medium (-6)</u>

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
			<p>The narrow riparian corridor must be strictly maintained as no-go areas beyond the area required for construction.</p> <p>No temporary construction accesses to be constructed into the riparian corridor, unless authorised by the Department of Water Affairs & Sanitation, through any surface water feature and no machinery to enter any surface water feature or buffer.</p>	
Alternative 2				
Construction phase	Direct impacts:			
	Habitat Destruction	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Very Likely (-4) Significance Rating: High (-13)	<i>Limit this impact to the footprint and immediate support areas only; Avoid indiscriminate destruction of habitat; Make alignment shifts to accommodate sensitive habitat features.</i>	Extent: Site (-1) Duration: Short-term (-2) Intensity: Moderate (-2) Probability of occurrence: Likely (-3) Significance Rating: Medium (-8)
	Biodiversity impacts	Extent: Local (-2) Duration: Long-term (-3) Intensity: Moderate (-2) Probability of occurrence: Possible (-2) Significance Rating: Medium (-9)	<i>Limit this impact to the footprint and immediate support areas only; Avoid indiscriminate destruction of habitat; If any RDL species are noted, they must be removed as part of a rescue and relocation plan; permission needs to be sought in order to remove/destroy protected floral species. Species such as Acacia mellifera, Acacia tortilis, or Dichrostachys cinerea should not be utilised for revegetation purposes in the early stages of veld succession (reclamation). Collection of firewood should not be allowed and fires should be prohibited unless designated areas can be provided for. Indiscriminate destruction of flora must be avoided, which is pertinent particularly to protected tree species within the area of the proposed development.</i>	Extent: Site (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of occurrence: Improbable (-1) Significance Rating: Low (-5)
	Soil impacts	Extent: Local (-2)	Soil erosion is readily mitigated for by the implementation	Extent: Local (-2)

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Likely (-3) <u>Significance Rating: High (-12)</u>	<i>of geotextiles and silt fencing on areas of steeper slopes, especially near aquatic habitats. Movement of heavy vehicles to be restricted to designated access points only. Upon completion, the impacted areas can be ripped to loosen the soils and enhance revegetation. Earthmoving and construction equipment should be serviced regularly to avoid fuel and oils leaks; Accidental spillages must be immediately reported to the ECO and clean up procedures implemented immediately. This would include the removal of the contaminated soils, which should be taken to a registered disposal facility.</i>	Duration: Short-term (-2) Intensity: Low (-2) Probability of occurrence: Improbable (-1) <u>Significance Rating: Medium (-7)</u>
	Impacts on aquatic biodiversity	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) <u>Significance Rating: High (-14)</u>	<i>Limit this impact to the footprint and immediate support areas only and avoid indiscriminate destruction of habitat.</i>	Extent: Local (-2) Duration: Short-term (-2) Intensity: Low (-2) Probability of occurrence: Improbable (-1) <u>Significance Rating: Medium (-7)</u>
	Water quality impacts	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) <u>Significance Rating: High (-14)</u>	<i>Equipment must be serviced and well maintained. Servicing of equipment should not take place at the edge of the watercourse but within designated areas only.</i>	Extent: Site specific (-1) Duration: Very Short (-1) Intensity: Very Low (-1) Probability of occurrence: Probable (-2) <u>Significance Rating: Low (-5)</u>
	Wetland impacts	Extent: Local (-2) Duration: Long Term (-3) Intensity: Medium (-3) Probability of occurrence: Very Likely (-4) <u>Significance Rating: High (-12)</u>	<i>Construction to be monitored by an ECO according to the stipulations of the EMP. No batching or chemical / fuel storage areas to be located within any surface water feature or within 100m of a surface water feature. Clearing of vegetation to be limited to the construction footprint. No temporary construction accesses (other than the construction right of way) to be constructed through any surface water feature and no machinery to enter any</i>	Extent: Site Specific (-1) Duration: Short-term (-1) Intensity: Low (-2) Probability of occurrence: Likely (-3) <u>Significance Rating: Medium (-7)</u>

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
			wetland unless authorised under the EMPr by the ECO as part of a construction activity. Watercourse channels and other parts of the surface water feature must be restored to as close a pre-construction state as possible.	
	Archaeological resources	Extent: Site specific (-1) Duration: Permanent (-5) Intensity: Low (-2) Probability of occurrence: Probable (-2) <u>Significance Rating: Medium (-10)</u>	No major features were noted during the field investigation. Impacts on what archaeological resources do occur may be limited by restricting the footprint of the development as far as possible, avoiding indiscriminate surface clearing/disturbance.	Extent: Site specific (-1) Duration: Permanent (-5) Intensity: Low (-2) Probability of occurrence: Improbable (-1) <u>Significance Rating: Medium (-9)</u>
	Waste	Extent: Local (-2) Duration: Medium (-2) Intensity: Moderate (-2) Probability of occurrence: Possible (-2) <u>Significance Rating: Medium (-8)</u>	Where possible, construction waste on site must be reused or recycled. Disposal of waste must be in accordance with relevant legislative requirements. The Contractor must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. Burning of waste material will not be permitted. Further detailed mitigation measures are included in the EMPr.	Extent: Local (-2) Duration: Short-term (-1) Intensity: Low (-1) Probability of occurrence: Possible (-2) <u>Significance Rating: Medium (-6)</u>
	Dust	Extent: Local (-2) Duration: Medium (-2) Intensity: Moderate (-2) Probability of occurrence: Possible (-2) <u>Significance Rating: Medium (-8)</u>	Frequent and effective dust-suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off.	Extent: Local (-2) Duration: Short-term (-1) Intensity: Low (-1) Probability of occurrence: Possible (-2) <u>Significance Rating: Medium (-6)</u>
	Noise	Extent: Local (-2) Duration: Medium (-2) Intensity: Moderate (-2)	Surrounding communities and adjacent landowners are to be notified upfront of noisy construction activities. Provide all equipment with standard silencers. Maintain silencer units on vehicles and equipment in good working	Extent: Local (-2) Duration: Short-term (-1) Intensity: Low (-1)

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		Probability of occurrence: Possible (-2) Significance Rating: Medium (-8)	<i>order.</i> <i>Construction staff working in areas where the 8-hour ambient noise levels exceed 60 dBA should wear ear protection equipment.</i>	Probability of Occurrence: Possible (-2) Significance Rating: Medium (-6)
	Traffic	Extent: Site (-1) Duration: Long-term (-4) Intensity: High (-3) Probability of Occurrence: Highly Probable (-3) Significance Rating: High (-11)	<i>Construction vehicles to avoid blocking off the farm access roads. The Contractor must provide alternative access around construction work areas.</i>	Extent: Local (-2) Duration: Medium (-2) Intensity: Moderate (-2) Probability of Occurrence: Possible (-2) Significance Rating: Medium (-8)
Indirect impacts:				
	Socio-economic	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) Significance Rating: Medium (+10)	<i>The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs.</i> <i>Jobs for the maintenance of infrastructure and services will be created following the completion of the development. These jobs might be made available to existing labour there creating long term employment.</i>	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) Significance Rating: Medium (+10)
Cumulative impacts:				
	Wetlands	Extent: Local (-2) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability of Occurrence: Likely (-3) Significance Rating: Medium (-9)	Construction to be guided by the EMPr and the mitigation measures stipulated in this report. Construction to be monitored by an ECO according to the stipulations of the EMPr. No batching or chemical / fuel storage areas to be located within 50m of the area of residual hydromorphic soils or the stream and associated riparian corridor. Construction-phase stormwater controls to be implemented along the stretch of the construction servitude adjacent to the area of residual hydromorphic soils, and around all stockpiles, including those placed on	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of Occurrence: Probable (-2) Significance Rating: Medium (-6)

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
			<p>site.</p> <p>The narrow riparian corridor must be strictly maintained as no-go areas beyond the area required for construction.</p> <p>No temporary construction accesses to be constructed into the riparian corridor, unless authorised by the Department of Water Affairs & Sanitation, through any surface water feature and no machinery to enter any surface water feature or buffer.</p>	
Alternative 3				
No-go option				
Direct Impacts				
<ul style="list-style-type: none"> • None of the negative impacts listed above will occur. • Cost escalation for infrastructure to CSP Plant makes it unviable to construct approved pipeline. • Lack of water to the CSP Plant (under construction) will lead to delays in completion and operation of the facility. 				
Indirect Impacts				
<ul style="list-style-type: none"> • Loss of employment opportunities and socio-economic benefits. 				
Cumulative Impacts				
<ul style="list-style-type: none"> • Financial loss to the region. 				

IMPACTS	Site Alternative 1 – Without Mitigation	Site Alternative 1 – With Mitigation
Direct Impacts		
Habitat Destruction	-11	-7
Biodiversity	-8	-5

IMPACTS	Site Alternative 1 – Without Mitigation	Site Alternative 1 – With Mitigation
Soil Impacts	-12	-7
Aquatic Biodiversity	-14	-7
Water Quality	-14	-5
Wetlands	-9	-5
Archaeological	-10	-9
Waste	-8	-6
Dust	-8	-6
Noise	-8	-6
Traffic	-11	-8
Average Total	-10.3	-6.5
Indirect Impacts		
Socio Economic	+10	+10
Average Total	+10	+10
Cumulative Impacts		
Wetlands	-8	-6
Average Total	-8	-6

IMPACTS	Site Alternative 2 – Without Mitigation	Site Alternative 2 – With Mitigation
Direct Impacts		
Habitat Destruction	-13	-8
Biodiversity	-9	-5
Soil Impacts	-12	-7
Aquatic Biodiversity	-14	-7
Water Quality	-14	-5
Wetlands	-12	-7
Archaeological	-10	-9
Waste	-8	-6
Dust	-8	-6
Noise	-8	-6
Traffic	-11	-8
Average Total	-10.8	-6.7
Indirect Impacts		
Socio Economic	+10	+10
Average Total	+10	+10
Cumulative Impacts		
Wetlands	-9	-6

Average Total

-9

-6

1.3 Impacts that may result from the operational phase

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
Alternative 1 (preferred alternative)				
Planning and design phase	Direct impacts:			
	Wetlands	Extent: Local (-2) Duration: Long-term (-3) Intensity: Moderate (-2) Probability of occurrence: Likely (-3) <u>Significance Rating: Medium (-10)</u>	<i>All construction footprint areas through riparian areas must be fully rehabilitated with the re-establishment of a vegetative cover that matches pre-construction vegetative cover</i> <i>Any development of erosion must be carefully monitored and managed</i> <i>It is critical that all alien invasive vegetation management in the servitude be undertaken at regular intervals (at least every 6 months) for the operational life of the pipeline servitude. This must not just be undertaken for riparian areas but for servitudes in adjacent areas. As part of this management all alien invasive vegetation within the servitude must be removed</i>	Extent: Local (-2) Duration: Medium-term (-3) Intensity: Low (-1) Probability of occurrence: Probable (-2) <u>Significance Rating: Medium (-8)</u>
	Water quality	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) <u>Significance Rating: High (-14)</u>	<i>Equipment must be serviced and well maintained. Servicing of equipment should not take place at the edge of the watercourse but within designated areas only.</i>	Extent: Site Specific (-1) Duration: Very Short (-1) Intensity: Very Low (-1) Probability of occurrence: Probable (-2) <u>Significance Rating: Low (-5)</u>
	Soil contamination	Extent: Local (-2)	<i>Equipment should be serviced regularly to avoid fuel and</i>	Extent: Local (-2)

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Likely (-3) <u>Significance Rating: High (-12)</u>	<i>oils leaks;</i> <i>Accidental spillages must be immediately reported to the relevant competent authorities and clean up procedures implemented immediately. This would include the removal of the contaminated soils, which should be taken to a registered disposal facility.</i>	Duration: Very Short (-1) Intensity: Very Low (-1) Probability of occurrence: Improbable (-1) <u>Significance Rating: Low (-5)</u>
	Soil erosion	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Very Likely (-4) <u>Significance Rating: High (-13)</u>	<i>Correct site reinstatement and landscaping details need to be adhered to and erosion management structures utilized in areas of steeper slopes. This potential impact is easily mitigated for with focused effort on the part of the contractors.</i>	Extent: Local (-2) Duration: Short-term (-2) Intensity: Very Low (-1) Probability of occurrence: Improbable (-1) <u>Significance Rating: Medium (-6)</u>
	Biodiversity	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) <u>Significance Rating: High (-14)</u>	<i>Monitoring for exotic species recruitment should be undertaken on a regular basis and managed appropriately should recruitment be noted.</i>	Extent: Local (-2) Duration: Short-term (-2) Intensity: Low (-2) Probability of occurrence: Probable (-2) <u>Significance Rating: Medium (-8)</u>
Indirect impacts:				
	Indirect impacts: Socio-economic	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) <u>Significance Rating: Medium (+10)</u>	<i>The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs.</i>	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) <u>Significance Rating: Medium (+10)</u>
Cumulative impacts				
	Wetlands	Extent: Local (-2) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability of Occurrence: Possible (-2)	Construction to be guided by the EMPr and the mitigation measures stipulated in this report.	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of Occurrence: Possible (-2)

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		<u>Significance Rating: Medium (-8)</u>		<u>Significance Rating: Medium (-6)</u>
Alternative 2				
Planning and design phase	Direct impacts:			
	Wetlands	Extent: Local (-2) Duration: Long-term (-3) Intensity: Medium (-3) Probability of occurrence: Very Likely (-4) <u>Significance Rating: High (-12)</u>	<p>All construction footprint areas through riparian areas must be fully rehabilitated with the re-establishment of a vegetative cover that matches pre-construction vegetative cover.</p> <p>Any development of erosion must be carefully monitored and managed.</p> <p>It is critical that all alien invasive vegetation management in the servitude be undertaken at regular intervals (at least every 6 months) for the operational life of the pipeline servitude. This must not just be undertaken for riparian areas but for servitudes in adjacent areas. As part of this management all alien invasive vegetation within the servitude must be removed</p>	Extent: Local (-2) Duration: Short-term (-2) Intensity: Low (-2) Probability of occurrence: Likely (-3) <u>Significance Rating: Medium (-9)</u>
	Water quality	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) <u>Significance Rating: High (-14)</u>	<p>Equipment must be serviced and well maintained. Servicing of equipment should not take place at the edge of the watercourse but within designated areas only.</p>	Extent: Site Specific (-1) Duration: Very Short (-1) Intensity: Very Low (-1) Probability of occurrence: Probable (-2) <u>Significance Rating: Low (-5)</u>
	Soil contamination	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Likely (-3) <u>Significance Rating: High (-12)</u>	<p>Equipment should be serviced regularly to avoid fuel and oils leaks;</p> <p>Accidental spillages must be immediately reported to the relevant competent authorities and clean up procedures implemented immediately. This would include the removal of the contaminated soils, which should be taken to a registered disposal facility.</p>	Extent: Local (-2) Duration: Very Short (-1) Intensity: Very Low (-1) Probability of occurrence: Improbable (-1) <u>Significance Rating: Low (-5)</u>
	Soil erosion	Extent: Local (-2) Duration: Long-term (-4)	<p>Correct site reinstatement and landscaping details need to be adhered to and erosion management structures</p>	Extent: Local (-2) Duration: Short-term (-2)

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
		Intensity: Medium (-3) Probability of occurrence: Very Likely (-4) Significance Rating: High (-13)	utilized in areas of steeper slopes. This potential impact is easily mitigated for with focused effort on the part of the contractors.	Intensity: Very Low (-1) Probability of occurrence: Improbable (-1) Significance Rating: Medium (-6)
	Biodiversity	Extent: Local (-2) Duration: Long-term (-4) Intensity: Medium (-3) Probability of occurrence: Definite (-5) Significance Rating: High (-14)	Monitoring for exotic species recruitment should be undertaken on a regular basis and managed appropriately should recruitment be noted.	Extent: Local (-2) Duration: Short-term (-2) Intensity: Low (-2) Probability of occurrence: Probable (-2) Significance Rating: Medium (-8)
Indirect impacts:				
	Socio-economic	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) Significance Rating: Medium (+10)	The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs.	Extent: Local (+2) Duration: Medium-term (+2) Intensity: Moderate (+2) Probability of Occurrence: Definite (+4) Significance Rating: Medium (+10)
Cumulative impacts:				
	Wetlands	Extent: Local (-2) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability of Occurrence: Possible (-2) Significance Rating: Medium (-8)	Construction to be guided by the EMP and the mitigation measures stipulated in this report.	Extent: Site Specific (-1) Duration: Medium-term (-2) Intensity: Low (-1) Probability of Occurrence: Possible (-2) Significance Rating: Medium (-6)
Alternative 3				
No-go option				
Direct Impacts				
<ul style="list-style-type: none"> None of the negative impacts listed above will occur. Cost escalation for infrastructure to CSP Plant makes it unviable to construct approved pipeline. 				

Activity	Impact summary	Significance	Proposed mitigation	Significance after mitigation
	<ul style="list-style-type: none"> Lack of water to the CSP Plant (under construction) will lead to delays in completion and operation of the facility. 			
Indirect Impacts				
	<ul style="list-style-type: none"> Loss of employment opportunities and socio-economic benefits. 			
Cumulative Impacts				
	<ul style="list-style-type: none"> Financial loss to the region. 			

IMPACTS	Site Alternative 1 – Without Mitigation	Site Alternative 1 – With Mitigation
Direct Impacts		
Wetlands	-10	-8
Water Quality	-14	-5
Soil Contamination	-13	-6
Soil Erosion	-14	-7
Biodiversity	-14	-8
Average Total	-13	-6.8
Indirect Impacts		
Socio Economic	+10	+10
Average Total	+10	+10
Cumulative Impacts		
Wetlands	8	6

Average Total	8	6
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IMPACTS	Site Alternative 2 – Without Mitigation	Site Alternative 2 – With Mitigation
Direct Impacts		
Wetlands	-12	-9
Water Quality	-14	-5
Soil Contamination	-13	-5
Soil Erosion	-14	-6
Biodiversity	-14	-8
Average Total	-13.4	-6.6
Indirect Impacts		
Socio Economic	+10	+10
Average Total	+10	+10
Cumulative Impacts		
Wetlands	-8	-6
Average Total	-8	-6

1.4 Impacts that may result from the decommissioning phase

N/A – this will need to be revisited on decommissioning. The chances are that the water abstraction point would merely be reallocated to another user rather than removed if no longer required by the Bokpoort CSP plant.

2. ENVIRONMENTAL IMPACT STATEMENT

Alternative A (preferred alternative)

The proposed realignment has become necessary due to technical constraints with the abstraction of water from the approved abstraction point forming part of the Bokpoort CSP project. The preferred alignment was chosen to limit the area of land not previously degraded from being sterilised. It was also placed to limit impacts on the pre-existing farmland adjacent to the Orange River, which also places much of the new alignment outside of the 32 m buffer line on the river. The proposed abstraction method (i.e. raft) has been chosen to limit environmental impacts and is believed to be the more environmentally safe option of the two possible alignments proposed to link to the existing abstraction point. Use of an existing abstraction point has a significantly reduced environmental impact over establishing a new abstraction point and thus is supported as being more sustainable and less detrimental.

Alternative B

This alternative runs through a longer area of relatively undisturbed vegetation and will be longer than the preferred realignment and the already approved alignment. From a construction point of view, ground conditions shall likely require the Client/Applicant to undertake extensive blasting activities in order to lay the pipeline, and this in turn, shall significantly increase costs. From a health and safety perspective, blasting activities increases risk greatly.

Alternative C

No-go alternative (compulsory)

The current approved abstraction point is not viable due to valid concerns about the operational, maintenance and construction aspects of the abstraction point; this includes difficulties in reaching the main channel of the Orange river, which is currently closer to the opposite side of a relatively broad section of the river, and the risk posed to the associated infrastructure during high water; thus this option is not deemed to be feasible. A true 'no go' option is not considered as the CSP is reliant on a water pipeline and such has been approved in terms of the already granted environmental authorisation.

3. RECOMMENDATION

EAP and Specialists' recommend authorization of the preferred alignment (Alternative A) along the existing farm servitude roadway, as above.