

**Application for Environmental Authorization for Proposed Establishment of an
Aquaculture Development Zone in Amatikulu, KwaZulu Natal**

APPENDIX F IMPACT ASSESSMENT TABLES

Compiled by:



NULEAF PLANNING AND ENVIRONMENTAL PTY LTD

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1. ASSESSMENT CRITERIA

The impacts anticipated to occur as a result of the proposed development are assessed/ evaluated to determine their significance. The following assessment criteria are used:

Extent (how far the impact extends):

- (1) **Very low:** within the site only
- (2) **Low:** within the local neighbourhoods
- (3) **Medium:** within the region
- (4) **High:** Nationally
- (5) **Very high:** Internationally

Duration (the timeframe over which the effects of the impact will be felt):

- (1) **Very short:** 0-2 years
- (2) **Short:** 3-5 years
- (3) **Medium:** 5-15 years
- (4) **Long:** >15 years
- (5) **Permanent**

Magnitude (the severity or size of the impact):

- (0) **None**
- (2) **Minor**
- (4) **Low**
- (6) **Moderate**
- (8) **High**
- (10) **Very High**

Probability (the likelihood of the impact actually occurring):

- (1) **Very improbable:** Less than 20% sure of the likelihood of an impact occurring
- (2) **Improbable:** 20-40% sure of the likelihood of an impact occurring
- (3) **Probable:** 40-60% sure of the likelihood of an impact occurring
- (4) **Highly probable:** 60-80% sure of the likelihood of that impact occurring
- (5) **Definite:** More than 80% sure of the likelihood of that impact occurring

The **significance** of the potential visual impact is determined by the sum of the individual scores for extent, duration and magnitude multiplied by the **probability** of the impact occurring i.e. **significance = (extent + duration + magnitude) x probability**.

The significance rating scale is interpreted as follows:

- (2-12) **Negligible:** Impact would be of a very low order. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap, and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit.
- (13-30) **Low:** Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
- (31-56) **Moderate:** Impact would be real but not substantial. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts, other means of achieving these benefits would be about equal in time, cost, and effort.

- **(57-90) High:** Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
- **(91-100) Very High:** Of the highest order possible. In the case of negative impacts, there would be no possible mitigation and / or remedial activity and in the case of positive impacts, there is no real alternative to achieving the benefit.

2. ENVIRONMENTAL IMPACT ASSESSMENT

The tables that follow detail the assessment of the significance of anticipated environmental impact during the entire project life cycle according to the impact assessment criteria. The findings of the various specialists appointed as part of the BAR process have informed the impact assessment below. These impacts been supplemented with additional impacts as deemed appropriate by the EAP.

2.1 Impacts that may result from the Planning and Design Phase

Planning and design phase impacts refer to those impacts that may be mitigated through planning decisions. In this respect, the potential impacts are articulated as ‘risks’ rather than ‘impacts’, because in reality, no impact occurs on the ground at all during the planning phase. The rationale behind this approach is to demonstrate the mitigating effect of environmentally responsible and appropriate planning and design during this phase.

Potential impacts:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance	Proposed mitigation:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance
ALTERNATIVE A1 (PREFERRED ALTERNATIVE)											
Direct Impacts											
Ground water											
None.						•					
Hydrology (surface water)											
Risk to ecological function of the riparian habitat along the estuary, wetlands and drainage lines due to the placement of structures and infrastructure within the habitat/ buffer zones. <i>This is particularly relevant due to the trenching and placement of intake and outlet pipelines.</i>	2	4	8	4	56 M	• Water Use planning and Specialist mitigation as per the EMPr (section 2.3 and 6.1).	2	4	4	3	30 L
Risk to hydrological function (quality and fluctuation properties) along the estuary, wetlands and drainage lines due to activity and disturbance within	3	5	8	4	64 H		3	5	4	3	36 M

the watercourse. <i>This is particularly relevant due to the trenching and placement of intake and outlet pipelines.</i>											
Marine Environment											
Risk to coastal habitat of marine fauna owing to placement of intake and discharge pipelines	2	4	6	4	48 M	• Specialist mitigation as per the EMPr (section 6)	2	4	4	3	30 L
Risk to subtidal soft sediment owing to placement of intake and discharge pipelines	3	5	10	5	90 VH		3	5	8	4	64 H
Estuarine Environment											
Risk to water quality of the estuary owing to poor dilution and mixing of aquaculture effluent as a result of inappropriate placement of the discharge pipeline	2	4	6	3	36 M	• Specialist mitigation as per the EMPr (section 6.1)	2	4	4	2	20 L
Risk of increased sedimentation of the estuary due to inadequate stormwater management	1	4	6	3	33 M		1	4	4	2	18 L
Risk to important habitat features such as <i>Zostera capensis</i> beds which are classified as Vulnerable due to placement of pipeline infrastructure	1	4	8	4	52 M		1	4	6	2	22 L
Risk to bed and banks of the estuary owing to placement of pipeline infrastructure	1	4	8	4	52 M		1	4	6	2	22 L
Risk to change in estuary mouth dynamics due to abstraction. This in turn could affect the water quality and habitat integrity	1	4	10	4	60 H		1	4	8	3	39 M
Risk to water quality and chemistry due to abstraction from and discharge into the estuary. This could result in changes to the salinity of the estuary	1	4	10	4	60 H		1	4	8	3	39 M
Biosecurity risk leading to the spread of diseases and introduced alien species to the estuary	1	4	8	4	52 M		1	4	6	3	33 M
Coastal Dunes, Sand movement and Soil											
Erosion risk to soils due to increased hard surface and associated increase in storm water runoff.	1	4	6	4	44 M	• Management and stabilization of soils as per the EMPr (section 3.5). • Clearing and site preparation as per the EMPr (section 3.1).	1	4	4	2	18 L
Risk to sensitive coastal dunes owing to placement of intake and discharge pipelines	2	4	10	4	64 H		2	4	6	3	39 M

							• Ecological assessment as per the EMPr (section 5.4)							
Air														
None.														
Biodiversity (Flora)														
Risk to endangered vegetation and associated loss of species richness due to the placement of structures and infrastructure.	3	4	8	4	60 H	<ul style="list-style-type: none"> • Development footprint planning as per the EMPr (section 2.1.) • Clearing and site preparation as per the EMPr (section 3.1). • Vegetation Management as per the EMPr (section 3.6). 	3	4	6	3	39 M			
Risk to sensitive habitats, specifically riparian zones, wetlands, dune slacks and dunes due to the placement of structures and infrastructure.	3	4	8	4	60 H		3	4	6	2	26 L			
Risk to Critical Biodiversity Areas due to clearing of vegetation and placement of infrastructure	3	5	8	5	80 H		3	5	6	3	42 M			
Risk to plant species of conservation importance due to the placement of structures and infrastructure within the habitat.	3	5	4	3	39 M		3	5	2	2	20 L			
Risk of invasion of alien vegetation owing to clearing of vegetation	1	1	6	4	32 M		1	1	4	3	18 L			
Biodiversity (Fauna)														
Risk to faunal habitat, which has a high to moderate significance for fauna species conservation and habitat fragmentation due to removal and alteration of the existing habitat and the development of structures and infrastructure.	2	4	10	4	64 H	<ul style="list-style-type: none"> • Development footprint planning as per the EMPr (section 2.1.) • Clearing and site preparation as per the EMPr (section 3.1). • Fauna Management as per the EMPr (section 3.7). 	2	4	8	4	56 M			
Land Use & Agricultural Potential														
None														
Heritage														
None.														
Visual														
Risk to visual quality of the surrounding area and sense of place due to the development of structures and infrastructure at the proposed site within an otherwise agricultural and natural environment.	2	4	6	4	48 M	<ul style="list-style-type: none"> • Development footprint planning as per the EMPr (section 2.1.) • Visual environment planning and lighting as per EMPr (section 2.2) • Clearing and site preparation as per the EMPr (section 3.1). 	2	4	4	3	30 L			

Potential impacts:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance	Proposed mitigation:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance
ALTERNATIVE A2 (LAYOUT ALTERNATIVE)											
Direct Impacts											
Ground water											
None.						•					
Hydrology (surface water)											
As per Alternative 1						• As per Alternative 1					
Marine Environment											
As per Alternative 1						• As per Alternative 1					
Estuarine Environment											
As per Alternative 1						• As per Alternative 1					
Coastal Dunes, Sand movement and Soil											
As per Alternative 1						• As per Alternative 1					
Risk to sensitive coastal dunes owing to placement of intake and discharge pipelines	2	4	10	4	64 H		2	4	6	3	39 M
<i>This impact is expected to be slightly higher owing to the increased development footprint</i>											
Air											
None.						•					
Biodiversity (Flora)											
Risk to endangered vegetation and associated loss of species richness due to the placement of structures and infrastructure.	3	4	8	4	60 H	• Development footprint planning as per the EMPr (section 2.1.) • Clearing and site preparation as per the EMPr (section 3.1).	3	4	6	3	39 M
<i>This impact will be higher owing to the increased development footprint</i>											

Risk to sensitive habitats, specifically riparian zones, wetlands, dune slacks and dunes due to the placement of structures and infrastructure. <i>This impact will be higher owing to the increased development footprint</i>	3	4	8	4	60 H	<ul style="list-style-type: none"> Vegetation Management as per the EMPr (section 3.6). 	3	4	6	2	22 L
Risk to Critical Biodiversity Areas due to clearing of vegetation and placement of infrastructure <i>This impact will be higher owing to the increased development footprint</i>	3	5	8	5	80 H		3	5	6	3	42 M
Risk to plant species of conservation importance due to the placement of structures and infrastructure within the habitat. <i>This impact will be slightly higher owing to the increased development footprint</i>	3	5	4	3	39 M		3	5	2	2	20 L
Risk of invasion of alien vegetation owing to clearing of vegetation	1	1	6	4	32 M		1	1	4	3	18 L
Biodiversity (Fauna)											
As per Alternative 1						<ul style="list-style-type: none"> As per Alternative 1 					
Land Use & Agricultural Potential											
None						<ul style="list-style-type: none"> 					
Heritage											
None.						<ul style="list-style-type: none"> 					
Visual											
As per Alternative 1						<ul style="list-style-type: none"> As per Alternative 1 					
Socio-economics											
None.						<ul style="list-style-type: none"> 					
Municipal services & traffic											
None.						<ul style="list-style-type: none"> 					
Indirect Impacts											
Socioeconomics											
As per Alternative 1						As per Alternative 1					
Cumulative Impacts											

Biodiversity (Flora)											
Cumulative loss of endangered vegetation and associated loss of species richness. This will result in the overall reduction thereof	3	4	8	4	60 H	<ul style="list-style-type: none"> • Development footprint planning as per the EMPr (section 2.1.) • Clearing and site preparation as per the EMPr (section 3.1). • Vegetation Management as per the EMPr (section 3.6). 	3	4	4	3	33 M
Cumulative loss of sensitive habitats	3	4	8	4	60 H		3	4	4	3	33 M
Cumulative reduction of plant species of conservation importance. This will result in the overall loss of these species.	3	5	4	3	36 M		3	5	2	2	20 L
Cumulative loss of Critical Biodiversity Areas <i>This impact is expected to higher owing to the larger development footprint</i>	3	5	10	4	72 H		3	5	8	3	48 M
Biodiversity (Fauna)											
As per Alternative 1						• As per Alternative 1					

NO-PROJECT ALTERNATIVE											
Direct Impacts											
None.						•					
Indirect Impacts											
None.						•					
Cumulative Impacts											
None.						•					

2.2 Impacts that may result from the Construction Phase

Construction phase impacts refer to those impacts that may be mitigated through sound construction management.

Potential impacts:	Proposed mitigation:										
	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance						
ALTERNATIVE A1 (PREFERRED ALTERNATIVE)											
Direct Impacts											
Ground water											
Depletion of ground water due to overuse and waste during construction activities	3	1	6	3	30 L	<ul style="list-style-type: none"> • Pre-construction planning, including development footprint planning and water use planning as per the EMPr (section 2.3) • Clearing and site preparation, layout, infrastructure and services, storm water managements as per the EMPr (section 3.1, 3.2, 3.4) • Construction water supplies as per the EMPr (section 3.10). 	3	1	4	2	16 L
Pollution and contamination of ground water due to: <ul style="list-style-type: none"> • Surface runoff • Unmanaged sewage discharge, leaks and spills • Solvent, paints and chemical spills • Hydrocarbon and fuel leaks and spills 	3	1	8	3	36 M		3	1	4	2	16 L
Hydrology (surface water)											
Disturbance and loss of ecological function of the habitat (physical structure) along the estuary, drainage lines and wetlands due to: <ul style="list-style-type: none"> • Clearing and destruction of riparian and wetland vegetation • Loss of fringing vegetation and erosion of denuded areas • Invasion by alien invasive trees and plants • Alteration in natural fire regimes • Shading of natural vegetation 	1	4	8	4	52 M	<ul style="list-style-type: none"> • Pre-construction planning, including development footprint planning and water use planning as per the EMPr (section 2.3) • Clearing and site preparation, layout, infrastructure and services, storm water managements as per the EMPr (section 3.1, 3.2, 3.4) • Integrated waste management as per the EMPr (section 3.8) • Construction water supplies as per the EMPr (section 3.10). • Fire management as per the EMPr (section 3.12) 	1	4	6	3	33 M

<p>Pollution and contamination of surface water of the estuary, drainage lines and wetlands due to:</p> <ul style="list-style-type: none"> • Unmanaged runoff of grey water, cement slurry and wash water. • Unmanaged sewage discharge, leaks and spills • Solvent, paints and chemical spills • Litter and other inert construction waste. • Hydrocarbon and fuel leaks and spills 	3	1	8	3	36 M	<ul style="list-style-type: none"> • Post construction rehabilitation as per the EMPr (section 3.14). • Specialist mitigation as per the EMPr (section 6) 	3	1	6	2	20 L
<p>Disturbance and loss of hydrological function (quality and fluctuation properties) of the estuary, drainage lines and wetland due to:</p> <ul style="list-style-type: none"> • Impeded and / or redirected flow due to activity within the water course • Uncontrolled discharges into the water resource (storm water) • Alteration of surface characteristics (roughness) due to activity within the water course • Removal of stabilising vegetation • Sedimentation and siltation from erosion 	2	5	8	4	60 H		2	5	6	3	39 M
Marine Environment											
<p>Permanent loss or alteration of coastal dune habitat due to construction vehicles and equipment on the sandy beaches.</p>	2	1	6	4	36 M	<ul style="list-style-type: none"> • Specialist mitigation as per the EMPr (section 6) 	2	1	4	3	21 L
<p>Permanent loss and/or modification of habitat and temporary disturbance of coastal marine fauna and flora during construction of the intake and discharge pipeline</p>	3	5	10	5	90 VH		3	5	10	5	90 VH
<p>Permanent loss or alteration of subtidal soft sediment habitat during construction of the intake and discharge pipeline</p>	3	5	10	5	90 VH		3	5	10	5	90 VH

The effect of increased noise and vibration from construction on marine organisms in the surrounding area/	1	1	4	3	18 L		1	1	2	2	8 N
The effect of waste generated during construction on aquatic fauna.	5	4	4	4	52 M		5	3	2	3	30 L
The effect of the spillage of hazardous substances owing to the use of heavy machinery, construction vehicles and construction vessels.	2	2	8	4	48 M		2	2	6	3	30 L
Estuarine Environment											
Increased sedimentation of the estuary due to unmanaged stormwater	1	1	8	4	40 M	<ul style="list-style-type: none"> Stormwater management as per EMPr (section 3.4) Specialist mitigation as per the EMPr (section 6) 	1	1	6	3	24 L
Disturbance and alterations to the bed and banks of the estuary owing to the placement of the pipelines	1	4	10	5	75 H		1	4	8	5	65 H
Disturbance and destruction of <i>Zostera capensis</i> beds classified as Vulnerable, as well as, habitat availability for fauna and flora	1	4	10	5	75 H		1	4	8	5	65 H
Coastal Dunes, Sand movement and Soil											
Soil contamination and pollution due to: <ul style="list-style-type: none"> Unmanaged surface runoff (grey water, cement slurry and wash water) Unmanaged sewage discharge, leaks and spills Solvent, paints and chemical spills Litter and other inert construction waste. Hydrocarbon and fuel leaks and spills 	1	1	6	4	32 M	<ul style="list-style-type: none"> Pre-construction planning, including development footprint planning and water use planning as per the EMPr (section 2.3) Clearing and site preparation, layout, infrastructure and services, sensitive areas. storm water management as per the EMPr (section 3.1, 3.2, 3.3, 3.4) Vegetation management as per the EMPr (section 3.6) Integrated waste management as per the EMPr (section 3.8) Chemicals and hydrocarbon fuels, and ablution facilities as per the EMPr (section 3.9 and 3.11) Rehabilitation as per the EMPr (section 3.14) 	1	1	4	3	18 L
Soil erosion by wind and rain due to: <ul style="list-style-type: none"> The removal of stabilising vegetation Soil compaction by movement of construction vehicles, equipment and activities Decrease in water infiltration and an increase of water runoff in construction areas Disturbance of sensitive soils 	1	4	6	3	33 M		1	4	4	2	18 L

Dune erosion due to: <ul style="list-style-type: none"> The removal of stabilizing vegetation Placement of marine pipelines 	2	4	8	4	56 M		2	4	6	3	36 M
Air											
Air pollution due emissions from construction vehicles and equipment.	2	1	4	4	28 L	<ul style="list-style-type: none"> Pre-construction planning, including development footprint planning and water use planning as per the EMPr (section 2.3) Clearing and site preparation, layout, infrastructure and services, sensitive areas. storm water management as per the EMPr (section 3.1, 3.2, 3.3, 3.4) Vegetation management as per the EMPr (section 3.6) Integrated waste management as per the EMPr (section 3.8) Chemicals and hydrocarbon fuels, and ablution facilities as per the EMPr (section 3.9 and 3.11) Fire management as per the EMPr (section 3.12) Rehabilitation as per the EMPr (section 3.14) 	2	1	4	3	21 L
Dust liberated by general construction activities and movement of construction vehicles.	2	1	4	4	28 L		2	1	4	3	21 L
Smoke from open fires used by site staff for heating and cooking as well as from uncontrolled fires.	2	1	6	3	27 L		2	1	4	2	14 L
Biodiversity (Flora)											
<i>Removal of exotic and declared invader species found throughout the site (positive impact).</i>	1	1	4	3	18 L	<ul style="list-style-type: none"> Pre-construction planning, including development footprint planning and water use planning as per the EMPr (section 2.3) Clearing and site preparation, layout, infrastructure and services, sensitive areas. storm water management as per the EMPr (section 3.1, 3.2, 3.3, 3.4) Vegetation management as per the EMPr (section 3.6) Integrated waste management as per the EMPr (section 3.8) Chemicals and hydrocarbon fuels, and ablution facilities as per the EMPr (section 3.9 and 3.11) Fire management as per the EMPr (section 3.12) Rehabilitation as per the EMPr (section 3.14) 	1	1	4	5	30 L
Loss of Endangered vegetation and associated loss of species richness due to: <ul style="list-style-type: none"> Site clearing ahead of construction General construction activities and movement of construction vehicles Unmanaged sewage discharge, leaks and spills Solvent, paints and chemical spills Hydrocarbon and fuel leaks and spills Litter and other inert construction waste 	1	5	8	4	56 M		1	4	4	3	27 L
Disturbance of sensitive habitats, specifically riparian zones, wetlands, dune slacks and dunes rated as having a high sensitivity due to:	1	5	8	4	56 M		1	4	8	3	39 M

<ul style="list-style-type: none"> • Site clearing ahead of construction • General construction activities and movement of construction vehicles • Unmanaged sewage discharge, leaks and spills • Solvent, paints and chemical spills • Litter and other inert construction waste. • Hydrocarbon and fuel leaks and spills 						<ul style="list-style-type: none"> • Specialist mitigation as per the EMPr (section 6) 					
Disturbance and destruction of critical biodiversity areas due to: <ul style="list-style-type: none"> • Site clearing ahead of construction • General construction activities and movement of construction vehicles 	1	4	10	5	75 H		1	4	10	5	75 H
Destruction to coastal environment owing to placement of infrastructure such as feeder pipelines and discharge pipes	3	4	10	4	68 H		3	4	8	3	45 M
Destruction and damage to plant species of conservation importance due to: <ul style="list-style-type: none"> • Site clearing ahead of construction • General construction activities and movement of construction vehicles 	1	5	8	3	42 M		1	5	4	2	20 L
Increase in exotic vegetation/alien species and bush encroachment into disturbed soils and areas due to: <ul style="list-style-type: none"> • Unmanaged cleared and disturbed areas, as well as, stockpiles • Unrehabilitated areas cleared and disturbed during construction • Construction vehicles operating on other sites and carrying material and seed onto site 	1	4	6	3	33 M		1	4	4	2	18 L
Biodiversity (Fauna)											

Loss of faunal habitat for conservation-important fauna species, specifically the critically endangered Pickergills Reed Frog, due to: <ul style="list-style-type: none"> • Site clearing ahead of construction • General construction activities and movement of construction vehicles • Construction dust • Construction material, litter and other inert construction waste 	2	4	10	5	80 H	<ul style="list-style-type: none"> • Pre-construction planning, including development footprint planning and water use planning as per the EMPr (section 2.3) • Clearing and site preparation, layout, infrastructure and services, sensitive areas. storm water management as per the EMPr (section 3.1, 3.2, 3.3, 3.4) • Vegetation and fauna management as per the EMPr (section 3.6 and 3.7) • Integrated waste management as per the EMPr (section 3.8) • Chemicals and hydrocarbon fuels, and ablution facilities as per the EMPr (section 3.9 and 3.11) • Fire management as per the EMPr (section 3.12) • Rehabilitation as per the EMPr (section 3.14) • Specialist mitigation as per the EMPr (section 6) 	2	4	8	5	70 H
Loss of general faunal habitat and ecological connectivity.	2	4	8	4	56 M		2	4	6	3	36 M
Mortality of fauna due to: <ul style="list-style-type: none"> • Dangerous trenches and excavations • Persecution and extermination • Solvent, paints and chemical spills (poisoning) • Construction material, litter and other inert construction waste (suffocation) • Collisions with construction vehicles 	2	1	6	3	26 L		2	1	4	2	14 L
Poaching and snaring of fauna on site and to a lesser degree in the adjacent Nature Reserves (Amatikulu and uMlalazi)	2	1	8	3	33 M		2	1	6	2	18 L
Land Use & Agricultural Potential											
None.						•					
Heritage											
<i>Possible discovery of new artefacts (positive impact)</i>	1	4	4	2	18 L	<ul style="list-style-type: none"> • Specialist mitigation as per the EMPr (section 6) 	1	4	4	2	18 L
Damage to and / or destruction of archaeological, paleontological or historical artefacts unearthed during construction.	1	5	4	2	20 L		1	5	2	1	8 N
Visual											

The visual impact of construction, lighting and dust on sensitive visual receptors (i.e. users of roads and observers residing in homesteads/farmsteads, tourism accommodation, beach goers) within the study area	3	2	8	3	39 M	<ul style="list-style-type: none"> • Pre-construction planning, including development footprint planning and water use planning as per the EMPr (section 2.3) • Clearing and site preparation, layout, infrastructure and services, sensitive areas. storm water management as per the EMPr (section 3.1, 3.2, 3.3, 3.4) • Vegetation management as per the EMPr (section 3.6) • Integrated waste management as per the EMPr (section 3.8) • Chemicals and hydrocarbon fuels, and ablution facilities as per the EMPr (section 3.9 and 3.11) • Fire management as per the EMPr (section 3.12) • Rehabilitation as per the EMPr (section 3.14) • Specialist mitigation as per the EMPr (section 6) 	3	2	6	2	22 L
Visual impact of construction, lighting and dust on protected areas (i.e. the Umlalazi Nature Reserve and the Amatikulu Nature Reserve) within the study area.	2	2	6	3	30 L		2	2	6	2	22 L
Socio-economics											
<i>Creation of short-term employment and business opportunities and the opportunity for skills development and on-site training. (Positive impact).</i> <i>Jobs and employment opportunities will be created, with a percentage being low and semi-skilled.</i>	2	1	6	3	27 L	<ul style="list-style-type: none"> • Pre-construction planning, including development footprint planning, water use planning and socioeconomics as per the EMPr (section 2.3 and 2.4) • Clearing and site preparation, layout, infrastructure and services, sensitive areas. storm water management as per the EMPr (section 3.1, 3.2, 3.3, 3.4) • Vegetation management as per the EMPr (section 3.6) • Integrated waste management as per the EMPr (section 3.8) • Chemicals and hydrocarbon fuels, and ablution facilities as per the EMPr (section 3.9 and 3.11) • Fire management as per the EMPr (section 3.12) • Rehabilitation as per the EMPr (section 3.14) • Specialist mitigation as per the EMPr (section 6) 	3	1	6	4	40 M
Noise, dust and safety impacts and disturbance to adjacent tourism developments and tourists/visitors to the adjacent Nature Reserves due to general construction activities and movement of construction vehicles.	2	1	6	4	36 M		2	1	4	3	21 L
An increase in construction workers and associated increase in social problems for the community, including: <ul style="list-style-type: none"> • An increase in alcohol and drug use; • An increase in crime levels; 	3	1	4	3	24 L		2	1	4	3	21 L

<ul style="list-style-type: none"> An increase in teenage and unwanted pregnancies; An increase in prostitution; An increase in sexually transmitted diseases (STDs). An increase in vandalism. 													
Increase in casual workers and associated increase in poaching.	2	1	8	4	44 M			2	1	4	4	28 L	
Increased risk of veld fires due to the presence of construction workers on site.	3	1	10	4	56 M			2	1	4	3	24 L	
Services & traffic													
Increase in traffic on local roads due to construction vehicles.	2	1	6	4	36 M	<ul style="list-style-type: none"> Pre-construction planning, including development footprint planning, water use planning and socioeconomics as per the EMPr (section 2.3 and 2.4) Clearing and site preparation, layout, infrastructure and services, sensitive areas. storm water management as per the EMPr (section 3.1, 3.2, 3.3, 3.4) Vegetation management as per the EMPr (section 3.6) Integrated waste management as per the EMPr (section 3.8) Chemicals and hydrocarbon fuels, and ablution facilities as per the EMPr (section 3.9 and 3.11) Fire management as per the EMPr (section 3.12) Rehabilitation as per the EMPr (section 3.14) Specialist mitigation as per the EMPr (section 6) 			2	1	4	3	21 L
Increase in the number and frequency of construction vehicles accessing the site and the resultant noise, dust, and safety impacts on other road users, residents of the local community and adjacent tourism developments.	2	1	6	4	36 M				2	1	2	3	15 L
Indirect Impacts													
Estuarine Environment													
Alteration of the flow regime and the PES of the estuary due to invasion of alien vegetation	1	4	10	4	60 H	<ul style="list-style-type: none"> As above 			1	4	6	2	22 L
Increased sedimentation of the estuary from erosion caused by removal of stabilizing vegetation	1	1	6	4	32 M				1	1	4	3	18 L
Biodiversity (Flora)													

Loss of floral biodiversity, plant species of conservation importance and protected trees due to increased incidence of veld fires	3	1	6	3	30 L	• As above	3	1	4	2	16 L
Socio-economics											
Loss of property and threat to human life due to increased incidence of veld fires	3	1	6	3	30 L	• As above	3	1	4	2	16 L
Traffic and services											
Degradation of local roads due to the increase in the numbers of heavy vehicles.	2	1	6	4	36 M	• As above	2	1	4	3	21 L
Cumulative Impacts											
Biodiversity (Flora)											
Cumulative loss of Endangered vegetation classified and associated loss of species richness. <i>Large portions of the site is already highly disturbed as such this impact is expected to be slightly lower than would otherwise be expected.</i>	3	4	6	3	39 M	• As above	3	4	4	2	22 L
Cumulative loss of ecological function of sensitive habitats, specifically riparian zones, wetlands, dune slacks and dunes.	3	4	8	4	60 H		3	4	6	2	26 L
Cumulative loss of critical biodiversity areas	3	4	10	4	68 H		3	4	8	3	45 M
Cumulative reduction and damage to plant species of conservation importance	3	5	6	3	42 M		3	5	4	2	24 L
Biodiversity (Fauna)											
Cumulative loss of faunal habitat for conservation-important fauna species, specifically the critically endangered Pickergills Reed Frog	2	4	10	4	64 H	• As above	2	4	8	3	42 M
Socio-economics											
<i>Community upliftment and the opportunity to upgrade and improve skills levels in the area. (positive impact)</i>	3	1	2	2	12 N	• As above	3	1	4	3	24 L
Services & traffic											
Cumulative increase in traffic and the resultant noise, dust, and safety impacts on other road users,	3	1	6	4	40 M	• As above	3	1	4	3	24 L

residents of the local community and adjacent tourism developments.													
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Potential impacts:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance	Proposed mitigation:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance
ALTERNATIVE A2 (ALTERNATIVE LAYOUT)											
Direct Impacts											
Ground water											
As per Alternative 1						• As per Alternative 1					
Hydrology (surface water)											
Disturbance and loss of ecological function of the habitat (physical structure) along the estuary, drainage lines and wetlands due to:	1	4	8	4	52 M	• As per Alternative 1	1	4	6	3	33 M
<ul style="list-style-type: none"> • Clearing and destruction of riparian and wetland vegetation • Loss of fringing vegetation and erosion of denuded areas • Invasion by alien invasive trees and plants • Alteration in natural fire regimes • Shading of natural vegetation 											
<i>This impact will be slightly higher owing to the fact that most of the wetland will be developed on</i>											

Pollution and contamination of surface water of the estuary, drainage lines and wetlands due to: <ul style="list-style-type: none"> • Unmanaged runoff of grey water, cement slurry and wash water. • Unmanaged sewage discharge, leaks and spills • Solvent, paints and chemical spills • Litter and other inert construction waste. • Hydrocarbon and fuel leaks and spills 	3	1	8	3	36 M		3	1	6	2	20 L
Disturbance and loss of hydrological function (quality and fluctuation properties) of the estuary, drainage lines and wetland due to: <ul style="list-style-type: none"> • Impeded and / or redirected flow due to activity within the water course • Uncontrolled discharges into the water resource (storm water) • Alteration of surface characteristics (roughness) due to activity within the water course • Removal of stabilising vegetation • Sedimentation and siltation from erosion <p><i>This impact will be slightly higher owing to the fact that most of the wetland will be developed on</i></p>	2	5	8	4	60 H		2	5	6	3	39 M
Marine Environment											
As per Alternative 1						• As per Alternative 1					
Estuarine Environment											
As per Alternative 1						• As per Alternative 1					
Coastal Dunes, Sand movement and Soil											
As per Alternative 1						• As per Alternative 1					
Dune erosion due to:	3	4	8	4	60		2	4	8	3	42

<ul style="list-style-type: none"> The removal of stabilizing vegetation Placement of marine pipeline <p><i>This impact will be higher owing to development within the ecological setback line.</i></p>					H									M
Air														
As per Alternative 1						• As per Alternative 1								
Biodiversity (Flora)														
Removal of exotic and declared invader species found throughout the site (positive impact).	1	1	4	3	18 L	• As per Alternative 1	1	1	4	5	30 L			
Loss of Endangered vegetation and associated loss of species richness due to: <ul style="list-style-type: none"> Site clearing ahead of construction General construction activities and movement of construction vehicles Unmanaged sewage discharge, leaks and spills Solvent, paints and chemical spills Hydrocarbon and fuel leaks and spills Litter and other inert construction waste <p><i>This impact will be higher owing to the placement of infrastructure in areas of high sensitivity, encroachment into the ecological setback line, and the larger development footprint</i></p>	1	5	8	4	56 M		1	4	6	3	33 M			
Disturbance of sensitive habitats, specifically riparian zones, wetlands, dune slacks and dunes due to: <ul style="list-style-type: none"> Site clearing ahead of construction General construction activities and movement of construction vehicles Unmanaged sewage discharge, leaks and spills Solvent, paints and chemical spills 	1	5	8	4	56 M		1	4	8	3	39 M			

<ul style="list-style-type: none"> Litter and other inert construction waste. Hydrocarbon and fuel leaks and spills <p><i>This impact will be slightly higher owing to development occurring within the ecological setback line.</i></p>										
Disturbance and destruction of critical biodiversity areas due to: <ul style="list-style-type: none"> Site clearing ahead of construction General construction activities and movement of construction vehicles 	1	4	10	5	75 H					
Destruction to coastal environment owing to placement of infrastructure such as feeder pipelines and discharge pipes	3	4	10	4	68 H					
Destruction and damage to plant species of conservation importance due to: <ul style="list-style-type: none"> Site clearing ahead of construction General construction activities and movement of construction vehicles 	1	5	8	3	42 M					
Increase in exotic vegetation/alien species and bush encroachment into disturbed soils and areas due to: <ul style="list-style-type: none"> Unmanaged cleared and disturbed areas, as well as, stockpiles Unrehabilitated areas cleared and disturbed during construction Construction vehicles operating on other sites and carrying material and seed onto site 	1	4	6	3	33 M					
Biodiversity (Fauna)										
As per Alternative 1						• As per Alternative 1				
Land Use & Agricultural Potential										
None.						•				

Heritage													
As per Alternative 1						• As per Alternative 1							
Visual													
As per Alternative 1						• As per Alternative 1							
Socio-economics													
As per Alternative 1						• As per Alternative 1							
Services & traffic													
As per Alternative 1						• As per Alternative 1							
Indirect Impacts													
Estuarine Environment													
As per Alternative 1						• As above							
Biodiversity (Flora)													
As per Alternative 1						• As above							
Socio-economics													
As per Alternative 1						• As above							
Traffic and services													
As per Alternative 1						• As above							
Cumulative Impacts													
Biodiversity (Flora)													
Cumulative loss of Endangered vegetation classified and associated loss of species richness. <i>Large portions of the site is already highly disturbed as such this impact is expected to be slightly lower than would otherwise be expected.</i>	3	4	6	3	33 M	• As above	3	4	4	2	18 L		
Cumulative loss of ecological function of sensitive habitats, specifically riparian zones, wetlands, dune slacks and dunes.	3	4	8	4	60 H		3	4	6	3	36 M		
Cumulative loss of critical biodiversity areas	3	4	10	4	68 H		3	4	8	3	45 M		
Cumulative reduction and damage to plant species of conservation importance	3	5	6	3	42 M		3	5	4	2	24 L		
Biodiversity (Fauna)													

As per Alternative 1						• As per Alternative 1					
Socio-economics											
As per Alternative 1						• As per Alternative 1					
Services & traffic											
As per Alternative 1						• As per Alternative 1					

NO-PROJECT ALTERNATIVE											
Direct Impacts											
None						•					
Indirect Impacts											
None.						•					
Cumulative Impacts											
None.						•					

2.3 Impacts that may result from the Operational Phase

Operational phase impacts refer to those impacts that may be mitigated through effective and efficient operating procedures.

Potential impacts:	Potential impacts:					Proposed mitigation:	Proposed mitigation:				
	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance		Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance
ALTERNATIVE A1 (PREFERRED ALTERNATIVE)											
Direct Impacts											
Ground water											
Depletion of ground water resources due to over use and waste during operation.	3	4	4	3	33 M	• Landscape and surround environment, sensitive areas, stormwater management as per the EMPr (sections 4.1, 4.1.1, 4.1.2)	3	4	2	2	18 L
Pollution and contamination of ground water due to:	3	4	6	3	39		3	4	4	2	22

<ul style="list-style-type: none"> • Unmanaged storm water runoff • Unmanaged sewage discharge • Sewage leaks and spills • Herbicides, pesticides and fertilisers • Discharge and spill of solvents, paints, chemicals and cleaning products • Discharge and spill of hydrocarbons and fuel 					M	<ul style="list-style-type: none"> • Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) • Specialist mitigation as per the EMPr (section 6) 					L
Hydrology (surface water)											
Disturbance and loss of ecological function of the habitat (physical structure) along the wetlands, drainage lines due to: <ul style="list-style-type: none"> • Encroachment of alien invasive species • Uncontrolled vegetation clearing and access by staff to pipelines 	1	4	8	3	39 M	<ul style="list-style-type: none"> • Landscape and surround environment, sensitive areas, stormwater management as per the EMPr (sections 4.1, 4.1.1, 4.1.2) • Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) • Specialist mitigation as per the EMPr (section 6) • Integrated waste management as per the EMPr (section 4.2.1) • Water, wastewater and ablution facilities as per the EMPr (section 4.2.2) • Management of production water as per the EMPr (section 4.3.2) 	1	4	6	2	22 L
Pollution and contamination of surface water due to: <ul style="list-style-type: none"> • Unmanaged storm water runoff • Litter and uncontrolled waste • Sewage leaks and spills • Herbicides, pesticides and fertilisers • Discharge and spill of solvents, paints, chemicals and cleaning products • Discharge and spill of hydrocarbons and fuel 	2	4	8	3	42 M		2	4	4	2	20 L
Addition of solids and nutrients to the marine environment owing to discharge	3	4	8	4	60 H		3	4	6	3	39 M
Changes to the water table (nutrient enrichment) owing to build up of organic material	3	4	8	4	60 H		3	4	6	3	39 M
Disturbance and loss of hydrological function (quality and fluctuation properties) along the wetlands and drainage lines due to:	1	4	8	3	39 M		1	4	6	2	22 L

<ul style="list-style-type: none"> • Uncontrolled discharges into the water resource (storm water) • Alteration of surface characteristics (roughness) due to activity within the water course (uncontrolled access by staff) • Removal of stabilising vegetation (uncontrolled clearing and access by staff) • Sedimentation and siltation from erosion 											
Marine Environment											
Impacts on water quality and physiological functioning of the marine system in a MPA due to effluent discharge.	3	4	10	4	68 H	<ul style="list-style-type: none"> • Landscape and surround environment, sensitive areas, stormwater management as per the EMPr (sections 4.1, 4.1.1, 4.1.2) 	3	4	6	2	26 L
Disturbance and/or mortality of marine life due to the intake of seawater.	3	4	10	4	68 H	<ul style="list-style-type: none"> • Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) 	2	4	4	3	30 L
Sediment scouring and shifts in sediment movement patterns.	3	5	10	5	90 VH	<ul style="list-style-type: none"> • Specialist mitigation as per the EMPr (section 6) • Integrated waste management as per the EMPr (section 4.2.1) 	3	4	6	3	39 M
Spillage of hydrocarbons, fuels etc	3	4	10	3	51 M	<ul style="list-style-type: none"> • Water, wastewater and ablution facilities as per the EMPr (section 4.2.2) • Management of production water as per the EMPr (section 4.3.2) 	3	4	6	3	39 M
Estuarine Environment											
Damage and destruction to aquatic features such as: <ul style="list-style-type: none"> • Scouring of the area at the opening of the intake pipeline • Loss of aquatic life in the vicinity of the opening of the pipeline due to water being pumped out of the estuary • Mortality of aquatic fauna 	2	4	10	4	64 H	<ul style="list-style-type: none"> • Landscape and surround environment, sensitive areas, stormwater management, fauna and flora as per the EMPr (sections 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4) • Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) • Specialist mitigation as per the EMPr (section 6) • Integrated waste management as per the EMPr (section 4.2.1) 	2	4	8	3	42 M
Localized erosion of the bed and banks of the estuary due to effluent discharge.	1	4	10	4	60 H		1	4	8	4	52 M

Reduction of water volumes of the estuary due to abstraction. This could result in extended mouth closure conditions	1	4	10	5	75 H	<ul style="list-style-type: none"> Water, wastewater and ablation facilities as per the EMPr (section 4.2.2) Management of production water as per the EMPr (section 4.3.2) Species and escape, disease monitoring, control and treatment as per the EMPr (section 4.3.3 and 4.3.5) 	1	4	10	4	60 H
Backflooding of the upstream sections of the estuary due to discharge of effluent during mouth closure conditions. This will result in loss of habitat and alteration of environmental conditions such as water quality and deterioration of the PES	1	4	10	5	75 H		1	4	10	4	60 H
Change to water chemistry and quality of the estuary. Depending on the mouth conditions (open or closed) this could result in change in the salinity	1	4	10	5	75 H		1	4	10	4	60 H
Coastal Dunes, Sand movement and Soil											
Soil contamination and pollution due to: <ul style="list-style-type: none"> Unmanaged storm water runoff Litter and uncontrolled waste Sewage leaks and spills Herbicides, pesticides and fertilisers Discharge and spill of solvents, paints, chemicals and cleaning products Discharge and spill of hydrocarbons and fuel 	1	4	8	3	39 M	<ul style="list-style-type: none"> Landscape and surround environment, sensitive areas, stormwater management, management and stabilization of soils, fauna and flora as per the EMPr (sections 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4) Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) Specialist mitigation as per the EMPr (section 6) Integrated waste management as per the EMPr (section 4.2.1) Water, wastewater and ablation facilities as per the EMPr (section 4.2.2) Management of production water as per the EMPr (section 4.3.2) 	1	4	4	2	18 L
Soil erosion due to: <ul style="list-style-type: none"> Soil compaction by uncontrolled movement of staff (especially vehicles) Runoff over exposed or cleared areas that have failed to rehabilitate. 	1	4	8	3	39 M		1	4	4	2	18 L
Air											
Air pollution by emissions from increased numbers of vehicles	3	4	8	3	45 M	<ul style="list-style-type: none"> Landscape and surround environment, sensitive areas, stormwater management, management and stabilization of soils, fauna and flora as per the EMPr (sections 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4) Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) Specialist mitigation as per the EMPr (section 6) 	3	4	4	2	22 L
Odours emitted from the facility owing to the processing of by-products and fish processing waste	2	4	6	4	48 M		2	4	4	3	30 L

						<ul style="list-style-type: none"> • Integrated waste management as per the EMPr (section 4.2.1) • Water, wastewater and ablution facilities as per the EMPr (section 4.2.2) • Management of production water as per the EMPr (section 4.3.2) • Grading, moving and harvesting as per the EMPr (section 4.3.8) 					
Biodiversity (Flora)											
Loss of vegetation types classified as Endangered due to uncontrolled vegetation clearing, encroachment of alien invasives and litter and waste	1	4	6	3	33 M	<ul style="list-style-type: none"> • Landscape and surround environment, sensitive areas, stormwater management, management and stabilization of soils, fauna and flora as per the EMPr (sections 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4) • Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) • Specialist mitigation as per the EMPr (section 6) • Integrated waste management as per the EMPr (section 4.2.1) • Water, wastewater and ablution facilities as per the EMPr (section 4.2.2) • Management of production water as per the EMPr (section 4.3.2) • Fire management as per the EMPr (section 4.1.6) 	1	4	4	2	18 L
Disturbance of sensitive habitats, specifically riparian zones and dune slacks and dunes due to: <ul style="list-style-type: none"> • Uncontrolled vegetation clearing and access by staff • Encroachment of alien invasive species • Litter and waste 	1	4	6	3	33 M		1	4	4	2	18 L
Destruction and damage to plant species of conservation importance due to uncontrolled vegetation clearing and access by staff.	1	5	6	3	36 M		1	5	4	2	20 L
Increase in exotic vegetation/alien species and bush encroachment into disturbed soils and areas in the event that the rehabilitation process is not successful. Colonisation and re-emergence of exotic vegetation / alien species into disturbed soils and poorly rehabilitated areas. Alien invasive species tend to out-compete indigenous, slower growing species and could also result in unsuccessful rehabilitation.	2	4	8	3	42 M		2	4	6	2	24 L
Biodiversity (Fauna)											
Faunal disturbances, displacement of taxa and changes in distribution and abundance due to:	1	4	6	4	44 M		1	4	4	3	27 L

<ul style="list-style-type: none"> Uncontrolled vegetation clearing and access by staff General operations (activities) of the facility 						<ul style="list-style-type: none"> Landscape and surround environment, sensitive areas, stormwater management, management and stabilization of soils, fauna and flora as per the EMPr (sections 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4) 					
Mortality of fauna due to:	2	4	4	4	40 M	<ul style="list-style-type: none"> Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) Specialist mitigation as per the EMPr (section 6) Integrated waste management as per the EMPr (section 4.2.1) Water, wastewater and ablution facilities as per the EMPr (section 4.2.2) Management of production water as per the EMPr (section 4.3.2) Fire management as per the EMPr (section 4.1.6) 	2	4	4	2	20 L
<ul style="list-style-type: none"> Persecution and extermination Solvents, paints, chemicals and cleaning products (poisoning) Litter and waste (suffocation) 											
Mortality of predatory bird species owing to improper disposal of fish and fish feed	2	5	6	3	39 M		2	5	4	2	22 L
Poaching and snaring of faunal species by staff.	2	4	6	3	36 M		2	4	6	2	24 L
Impact on local marine life owing to farmed species escaping	3	5	8	3	48 M		3	5	6	2	28 L
Land Use & Agricultural Potential											
None.						•					
Heritage											
None.						•					
Visual											
Visual impact of direct lighting and sky glow on sensitive visual receptors in close proximity to the proposed development.	2	5	6	3	39 M	<ul style="list-style-type: none"> Landscape and surround environment, sensitive areas, stormwater management, management and stabilization of soils, fauna and flora as per the EMPr (sections 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4) Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) Specialist mitigation as per the EMPr (section 6) Integrated waste management as per the EMPr (section 4.2.1) Water, wastewater and ablution facilities as per the EMPr (section 4.2.2) Management of production water as per the EMPr (section 4.3.2) 	2	5	4	2	22 L
Visual impact of the proposed development on the visual quality of the landscape and sense of place of the region	3	5	6	3	42 M		3	5	6	2	28 L

						• Fire management as per the EMPr (section 4.1.6)					
Socio-economics											
Creation of long term employment and business opportunities as well as opportunities for skills development and transfer (positive impact)	3	5	4	2	24 L	<ul style="list-style-type: none"> • Landscape and surround environment, sensitive areas, stormwater management, management and stabilization of soils, fauna and flora as per the EMPr (sections 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4) • Chemicals and hydrocarbon fuels, aquaculture chemicals as per the EMPr (section 4.2.4 and 4.3.7) • Specialist mitigation as per the EMPr (section 6) • Integrated waste management as per the EMPr (section 4.2.1) • Water, wastewater and ablution facilities as per the EMPr (section 4.2.2) • Management of production water as per the EMPr (section 4.3.2) • Fire management as per the EMPr (section 4.1.6) • Employee facilities and employment conditions as per the EMPR (section 5.1) 	3	5	4	3	36 M
Noise, dust and safety impacts and disturbance to beach-goers, adjacent tourism developments and tourists/visitors to the adjacent Nature Reserves due to high pressure pumps etc.	2	4	6	3	36 M		2	4	4	2	20 L
Service and traffic											
Operational cost of running services and infrastructure, specifically electricity	1	4	6	4	44 M	• Employee facilities and employment conditions as per the EMPR (section 5.1)	1	4	6	4	44 M
Increase in the number and frequency of vehicles accessing the site, and the resultant noise, dust, and safety impacts on other road users, residents of the local community and adjacent tourism developments and Nature Reserves.	2	4	4	4	40 M		2	4	2	2	16 L
Indirect Impacts											
Estuarine Environment											
Change to water quality of the estuary due to unmanaged, contaminated stormwater from the ADZ	1	4	8	4	52 M	• As above	1	4	6	3	33 M
Increase in sedimentation of the estuary as a result of erosion of sediment surrounding the pipelines	1	4	6	4	44 M		1	4	4	3	27 L
Visual											

Visual impact of the proposed development on the sense of place and visual character of the region.	3	4	6	4	39 M	• As above	2	4	2	4	24 L
Cumulative Impacts											
Biodiversity (Flora)											
Cumulative loss of Endangered vegetation classified as Least Threatened and associated loss of species richness.	3	4	8	4	60 H	• As above	3	4	4	3	33 M
Cumulative disturbance of sensitive habitats, specifically riparian zones.	3	4	6	4	52 M		3	4	4	3	33 M
Cumulative reduction and damage to plant species of conservation importance	3	5	6	3	42 M		3	5	4	2	24 L
Visual											
The accumulation of built forms within an otherwise mostly agricultural and natural environment.	3	4	6	3	39 M	• As above	3	4	4	2	22 L
Socio-economics											
<i>Creation of permanent employment and skills and development opportunities for members from the local community (positive impact)</i>	3	4	2	2	18 L	• As above	3	4	4	3	33 M
<i>Promotion of social and economic development in the local communities and improvement in the overall well-being of the community (positive impact)</i>	3	4	2	2	18 L		3	4	2	3	27 L
Services and traffic											
Cumulative increase in the number and frequency of vehicles accessing the site, and the resultant noise, dust, and safety impacts for other road users, adjacent tourism development and residents of the local communities.	3	4	6	3	39 M	• As above	3	4	4	2	22 L

Potential impacts:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance	Proposed mitigation:	Extent (1-5)	Duration (1-5)	Magnitude (0-10)	Probability (1-5)	Significance
ALTERNATIVE A2 (LAYOUT ALTERNATIVE)											
Direct Impacts											
Ground water											
As per Alternative 1						• As per Alternative 1					
Hydrology (surface water)											
As per Alternative 1						• As per Alternative 1					
Marine Environment											
As per Alternative 1						• As per Alternative 1					
Estuarine Environment											
As per Alternative 1						• As per Alternative 1					
Coastal Dunes, Sand movement and Soil											
As per Alternative 1						• As per Alternative 1					
Air											
As per Alternative 1						• As per Alternative 1					
Biodiversity (Flora)											
As per Alternative 1						• As per Alternative 1					
Biodiversity (Fauna)											
As per Alternative 1						• As per Alternative 1					
Land Use & Agricultural Potential											
None.						•					
Heritage											
None.						•					
Visual											
As per Alternative 1						• As per Alternative 1					
Socio-economics											

Creation of long term employment and business opportunities as well as opportunities for skills development and transfer (positive impact)	3	5	4	2	24 L	• As per Alternative 1	3	5	4	3	36 M
Noise, dust and safety impacts and disturbance to beach-goers, adjacent tourism developments and tourists/visitors to the adjacent Nature Reserves due to high pressure pumps etc.	2	4	6	3	36 M		2	4	4	2	20 L
Flooding of the facility due to development within the ecological setback line	2	4	10	4	64 H		2	4	8	3	42 M
Service and traffic											
As per Alternative 1						• As per Alternative 1					
Indirect Impacts											
Visual											
As per Alternative 1						• As per Alternative 1					
Cumulative Impacts											
Biodiversity (Flora)											
As per Alternative 1						• As per Alternative 1					
Visual											
As per Alternative 1						• As per Alternative 1					
Socio-economics											
As per Alternative 1						• As per Alternative 1					
Services and traffic											
As per Alternative 1						• As per Alternative 1					

NO-PROJECT ALTERNATIVE												
Direct Impacts												
No stimulation of the local economy	3	4	6	4	52 M	• None.	3	4	6	4	52 M	
No short term and long-term employment through skills development and on-site training.	3	4	6	4	52 M	• None.	3	4	6	4	52 M	
Indirect Impacts												
None.						•						
Cumulative Impacts												
No opportunity to up-grade and improve skill levels in the area.	3	4	6	4	52 M	• None.	3	4	6	4	52 M	

2.4 Decommissioning Phase

The decommissioning of the facility is not anticipated at this stage and, therefore, no impacts are assessed.