ECO-CON ENVIRONMENTAL
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APPENDIX F – IMPACT ASSESSMENT

Proposed cultivation of 19 ha virgin soil for the establishment of 1 Seed Potato Farming Pivot and associated water pipeline on the Remaining Extent of the Farm Reliance No. 347 near Griekwastad, Northern Cape Province

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Prepared for:

Secundis Beleggings (Pty) Ltd.
Mr. Hennie Stander
hennie@hencar.co.za
078 451 0922

Prepared by:

Johan Botes
johan@eco-con.co.za
051 436 1254
082 459 8206

ENVIRONMENTAL IMPACT ASSESSMENT

The following section identifies the potential environmental impacts (both positive and negative) which the construction as well as operational phases of the proposed project will have on the surrounding environment.

Once the potential environmental impacts are identified, they are assessed by rating their Environmental Risk after which the final Environmental Significance is calculated and rated for each identified environmental impact.

The same Environmental Risk rating process is then followed for each environmental impact to determine the Environmental Significance if the recommended mitigation measures were to be implemented.

The objective of this section is therefore firstly to identify all the potential environmental impacts of the proposed project and secondly to determine the significance of the impacts and how effective the recommended mitigation measures will be able to reduce their significance. The potential environmental impacts which are still rated as highly significant, even after implementation of mitigations, can then be identified in order to specifically focus on implement of effective management strategies for them.

METHODOLOGY FOR IMPACT ASSESSMENT AND RISK RATING

The tables below indicate and explain the methodology and criteria used for the evaluation of the Environmental Risk Ratings as well as the calculation of the final Environmental Significance Ratings of the identified potential environmental impacts.

Each potential environmental impact is scored for each of the Evaluation Components as per the table below.

Table 1: Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating Scale and Description/criteria
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	**10 - Very high**: Bio-physical and/or social functions and/or processes might be *severely* altered. **8 - High**: Bio-physical and/or social functions and/or processes might be *considerably* altered. **6 - Medium**: Bio-physical and/or social functions and/or processes might be *notably* altered. **4 - Low** : Bio-physical and/or social functions and/or processes might be *slightly* altered.

	2 - Very Low: Bio-physical and/or social functions and/or processes might be *negligibly* altered. **0 - Zero**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**10 - Very high (positive)**: Bio-physical and/or social functions and/or processes might be *substantially* enhanced. **8 - High (positive)**: Bio-physical and/or social functions and/or processes might be *considerably* enhanced. **6 - Medium (positive)**: Bio-physical and/or social functions and/or processes might be *notably* enhanced. **4 - Low (positive)**: Bio-physical and/or social functions and/or processes might be *slightly* enhanced. **2 - Very Low (positive)**: Bio-physical and/or social functions and/or processes might be *negligibly* enhanced. **0 - Zero (positive)**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
DURATION	**5 - Permanent** **4 - Long term**: Impact ceases after operational phase/life of the activity > 60 years. **3 - Medium term**: Impact might occur during the operational phase/life of the activity – 60 years. **2 - Short term**: Impact might occur during the construction phase - < 3 years. **1 - Immediate**
EXTENT (or spatial scale/influence of impact)	**5 - International**: Beyond National boundaries. **4 - National**: Beyond Provincial boundaries and within National boundaries. **3 - Regional**: Beyond 5 km of the proposed development and within Provincial boundaries. **2 - Local**: Within 5 km of the proposed development. **1 - Site-specific**: On site or within 100 m of the site boundary. **0** - None
IRREPLACEABLE loss of resources	**5 – Definite** loss of irreplaceable resources. **4 – High** potential for loss of irreplaceable resources. **3 – Moderate** potential for loss of irreplaceable resources. **2 – Low** potential for loss of irreplaceable resources. **1 – Very low** potential for loss of irreplaceable resources. **0 - None**
REVERSIBILITY of impact	**5 –** Impact **cannot** be reversed. **4 – Low** potential that impact might be reversed. **3 – Moderate** potential that impact might be reversed. **2 – High** potential that impact might be reversed. **1 –** Impact **will be** reversible. **0 –** No impact.
	5 - Definite: >95% chance of the potential impact occurring.

PROBABILITY (of occurrence)	**4 - High probability**: 75% - 95% chance of the potential impact occurring. **3 - Medium probability**: 25% - 75% chance of the potential impact occurring **2 - Low probability**: 5% - 25% chance of the potential impact occurring. **1 - Improbable**: <5% chance of the potential impact occurring.
Evaluation Component	**Rating Scale and Description/criteria**
CUMULATIVE impacts	**High**: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Medium**: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Low**: The activity is localised and might have a negligible cumulative impact. **None**: No cumulative impact on the environment.

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 19 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 2: Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description/criteria
125 – 150	**Very high (VH)**	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	**High (H)**	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.

75 – 99	**Medium-high (MH)**	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	**Medium (M)**	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	**Low (L)**	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	**Positive impact (+)**	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

PLANNING, DESIGN AND CONSTRUCTION PHASE			
Potential Flora Impacts:			
Nature of impact: Direct impact on Flora as a result of vegetation clearance.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	4	2	2
Duration:	5	5	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	2	1	2
Probability:	5	5	2
Total SP:	70	50	14
Significance rating:	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium-high (MH)	Medium-high (MH)	Low (L)
Proposed Mitigation:	• Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation. • Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.		
Potential Fauna Impacts:			
Nature of impact: Direct impact on Fauna as a result of vegetation clearance.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	2
Duration:	5	5	2

Extent:	2	2	1
Irreplaceable:	2	2	1
Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	26	24	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.		

Potential Dust Impacts:	
Nature of impact: Dust nuisance generated during the development / preparation of the pivots.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	6	4	2
Duration:	2	2	2
Extent:	2	2	1
Irreplaceable:	2	2	1
Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	28	22	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Dust Management measures must be implemented in order to manage and minimize undesired dust emissions. • Access roads need to be well maintained and dust suppression need to be applied during windy days. • Pivots need to be rehabilitated by planting buffalo grass while not in use (7-year cycle apply to these pivots)		

Potential Noise Impacts:	
Nature of impact:	**Activity:**

Noise nuisance generated during the development / preparation of the pivots.			Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	2
Duration:	2	2	2
Extent:	2	2	1
Irreplaceable:	2	2	1
Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Limit working hours of noisy equipment to daylight hours. • Fit silencers to equipment. • Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to 17:00 Mondays to Fridays). • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. • No loud music is permitted on site or in the camp.		
Potential Cultural and Heritage Impacts:			
Nature of impact: Damage and destruction of vertebrate fossils during excavation activities.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	0
Duration:	2	1	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	2	1	1
Probability:	1	1	1
Total SP:	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Should any heritage resources (including but not limited to fossils, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and or built features, rock art and rock engravings) be exposed during excavations		

	for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority.
	• Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given.
	• Under no circumstances shall any heritage material be destroyed or removed from site.
	• Excavations must be limited to the footprint area and be maintained in a narrow corridor.
	• All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:
	  • All construction in the immediate 50 metre vicinity of the site must be ceased.
	  • The heritage practitioner must be informed as soon as possible.
	  • In the event of obvious human remains SAPS must be notified.
	  • Mitigation measures (such as refilling) must not be attempted.
	  • The area in a 50 metre radius of the find must be barricaded with visible taping.
	• Public access must be limited and the area must be placed under guard.

Potential Surface and Groundwater Contamination Impacts:

Nature of impact: Surface and Groundwater Contamination during the development / preparation of the pivots.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0
Duration:	1	1	0
Extent:	2	1	0
Irreplaceable:	1	1	0
Reversibility:	1	1	0
Probability:	1	1	0
Total SP:	7	4	0
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Ensure that excavation areas have a predetermined stockpile area for excavated materials. • Use overburden for rehabilitation. • Any remaining overburden to be disposed of at a licensed waste site. • Alternatively, concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages.		

	• All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site. • Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.

Potential Waste Management Impacts:					
Nature of impact: Waste impacts by means of waste storage and littering during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**		
	Before Mitigation	**After Mitigation**			
Magnitude:	2	2	2		
Duration:	2	2	2		
Extent:	2	2	1		
Irreplaceable:	2	2	1		
Reversibility:	2	1	2		
Probability:	2	2	2		
Total SP:	24	18	16		
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited. • Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle. • Keep all work sites including storage areas, offices and workshops neat and tidy. • All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site. • Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised. • The burning and burying of solid waste on site is prohibited. • Littering by construction workers shall not be permitted. • General waste shall be removed from site on a weekly basis to an approved landfill site. • Minimise waste by sorting waste into recyclable and non-recyclable materials.				
Potential Traffic Impacts:					
Nature of impact:				**Activity:**	

Traffic impacts by means of additional truck and transportation to and from site during the development / preparation of the pivots.			Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	0
Duration:	2	1	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	2	1	1
Probability:	1	1	1
Total SP:	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Abnormal loads should be timed to avoid times of the year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods. • All vehicles should be road worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. • Any damage to public roads is to be reported to the management authority and repaired to its original condition. • Signage is to be placed on vehicles at all times.		
Potential Fire Risk Impacts:			
Nature of impact: Increase risk of fires during the development / preparation of the pivots.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	0
Duration:	1	1	1
Extent:	2	1	1
Irreplaceable:	2	1	1
Reversibility:	2	1	1
Probability:	1	1	1
Total SP:	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment.		

	• All construction equipment must have at least one firefighting extinguisher. • Workers must be adequately trained in the handling of firefighting equipment. • No open fires are permitted anywhere on site due to the handling of gas on site. No fires will be permitted for heating or cooking purposes on site. • Fuel and chemicals must be stored in an area that is acceptable for the client. • No smoking will be allowed within close vicinity of the site.		
Potential Soil Contamination Impacts:			
Nature of impact: Increased Soil contamination by means of hazardous substances.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0
Duration:	1	1	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	1	0	1
Probability:	2	1	1
Total SP:	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• No leaked oil or fuel tankers may contaminate soil • All tanks and pipes containing fuel or oil must be inspected on a regular basis • Spills outside the bund area must be treated with a spill kit • All significant leaks must be reported to the competent authority in terms of NEMA • UST must be fitted with leak detectors in order to alert when a leak is occurring. • Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices. • Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher • A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions. • All personnel working with fuel must undergo spill kit training • The oil/water separator must be inspected on a regular basis and the inspection report must be provided to the ECO and relevant authority. • Following a leak or accidental spill, a remediation plan must be compiled and executed. • Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.		
Potential Soil Erosion Impacts:			
Nature of impact:			**Activity:**

Increased Soil erosion due to construction activities.			Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	4	2	0
Duration:	1	1	1
Extent:	2	1	1
Irreplaceable:	2	1	1
Reversibility:	1	1	1
Probability:	2	1	1
Total SP:	20	6	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)
Proposed Mitigation:	• During construction, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated, • All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line, • Temporary cut off drains may be required to capture storm water and promote infiltration, • All storm water management features must be constructed in a manner that will ensure the continued functioning of the emergent vegetation. Construction must coincide with the dry season.		
Potential Visual Impacts:			
Nature of impact: Increased visual impact due to increased working activities on-site.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0
Duration:	1	1	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	1	0	1
Probability:	2	1	1
Total SP:	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)

Proposed Mitigation:	• All waste must be placed in bins during operational phase. Keeping the area litter free. • Construction activities may only take place during normal working hours.		
Potential Socio-Economic Impacts:			
Nature of impact: Increased socio-economic conditions due to job creation			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	6	8	8
Duration:	1	1	1
Extent:	2	2	2
Irreplaceable:	2	2	2
Reversibility:	2	2	2
Probability:	4	5	4
Total SP:	52	75	60
Significance rating:	+ Medium (M)	+ Medium-high (MH)	Medium (M)
Cumulative impact:	+ Medium (M)	+ Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure that low-, medium- and high skilled workers use provided working opportunities. • Low-, medium- and high skilled workers must be sourced locally. • Were practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities. • Individuals must be trained and continuously developed		

OPPERATIONAL PHASE			
Potential Flora Impacts:			
Nature of impact: Direct impact on flora as a result of continuous vegetation clearance.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	2
Duration:	5	5	2
Extent:	2	2	1
Irreplaceable:	2	2	1
Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	26	24	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during operation. • Alien and invasive species need to be eradicated and controlled.		
Potential Fauna Impacts:			
Nature of impact: Continuous impact on Fauna as a result of cleared vegetation / habitat loss.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	2
Duration:	5	5	2
Extent:	2	2	1
Irreplaceable:	2	2	1
Reversibility:	2	1	2
Probability:	2	2	2

Total SP:	26	24	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during operation. • No hunting of any animal is to take place on site. • Specials care are to be taken not to work near or disturb any vulture nests, especially during breading seasons.		
Potential Dust Impacts:			
Nature of impact: Dust nuisance generated during the operational phase of the project.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	6	4	2
Duration:	2	2	2
Extent:	2	2	1
Irreplaceable:	2	2	1
Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	28	22	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Dust Management measures must be implemented in order to manage and minimize undesired dust emissions. • Access roads need to be well maintained and dust suppression need to be applied during windy days. • Pivots need to be rehabilitated by planting buffalo grass while not in use (7-year cycle apply to these pivots)		
Potential Noise Impacts:			
Nature of impact: Noise nuisance generated during the operational phase of the pivots.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	2
Duration:	2	2	2
Extent:	2	2	1
Irreplaceable:	2	2	1

Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Limit working hours of noisy equipment to daylight hours. • Fit silencers to equipment. • Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to 17:00 Mondays to Fridays). • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. • No loud music is permitted on site or in the camp.		

Potential Cultural and Heritage Impacts:			
Nature of impact: Damage and destruction of vertebrate fossils during the operational phase.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	0
Duration:	2	1	1
Extent:	1	1	1
Irreplaceable:	1	1	1
Reversibility:	1	1	1
Probability:	1	1	1
Total SP:	7	6	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Should any heritage resources (including but not limited to fossils, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and or built features, rock art and rock engravings) be exposed during excavations, all works in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority. • Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given. • Under no circumstances shall any heritage material be destroyed or removed from site. • Excavations must be limited to the footprint area and be maintained in a narrow corridor. • All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:		

	• All construction in the immediate 50 metre vicinity of the site must be ceased. • The heritage practitioner must be informed as soon as possible. • In the event of obvious human remains SAPS must be notified. • Mitigation measures (such as refilling) must not be attempted. • The area in a 50 metre radius of the find must be barricaded with visible taping. • Public access must be limited and the area must be placed under guard.

Potential Surface and Groundwater Contamination Impacts:			
Nature of impact: Surface and Groundwater Contamination during the operational phase by means of fertilizer and/or any other hazardous substances or pesticides.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0
Duration:	1	1	0
Extent:	2	1	0
Irreplaceable:	1	1	0
Reversibility:	1	1	0
Probability:	1	1	0
Total SP:	7	4	0
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• When fertilisers / pesticides are used, ensure that all fertilisers / pesticides are environmentally friendly. • When fertilisers / pesticides are used, only use the correct amount as indicated by the parcels. Do not over use. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages. • All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site. • Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary equipment and beneath all generators present on site.		

Potential Waste Management Impacts:	
Nature of impact: Waste impacts by means of waste storage and littering during the operational phase of the pivots.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	Preferred Layout Alternative		No-Go Alternative
	Before Mitigation	After Mitigation	
Magnitude:	2	2	2
Duration:	2	2	2
Extent:	2	2	1
Irreplaceable:	2	2	1
Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited. • Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle. • Keep all work sites including storage areas, offices and workshops neat and tidy. • All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site. • Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised. • The burning and burying of solid waste on site is prohibited. • Littering by workers shall not be permitted. • General waste shall be removed from site on a weekly basis to an approved landfill site. • Minimise waste by sorting waste into recyclable and non-recyclable materials.		

Potential Traffic Impacts:	
Nature of impact: Traffic impacts by means of additional truck and transportation to and from site during the operational phase of the pivots.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	Preferred Layout Alternative		No-Go Alternative
	Before Mitigation	After Mitigation	
Magnitude:	2	2	0
Duration:	2	1	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	2	1	1
Probability:	1	1	1
Total SP:	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)

Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Abnormal loads should be timed to avoid times of the year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods. • All vehicles should be road worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. • Any damage to public roads is to be reported to the management authority and repaired to its original condition. • Signage is to be placed on vehicles at all times.		
Potential Fire Risk Impacts:			
Nature of impact: Increase risk of fires during the operational phase of the pivots.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	0
Duration:	2	1	1
Extent:	1	1	1
Irreplaceable:	1	1	1
Reversibility:	1	1	1
Probability:	1	1	1
Total SP:	7	6	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure the work site is equipped with adequate firefighting equipment. • All equipment must have at least one firefighting extinguisher. • Workers must be adequately trained in the handling of firefighting equipment. • No open fires are permitted anywhere on site. • No fires will be permitted for heating or cooking purposes on site. • Fuel and chemicals must be stored in an area that is acceptable for the client. • Dedicated smoking areas are to be provided.		
Potential Soil Contamination Impacts:			
Nature of impact: Increased Soil contamination by means of hazardous substances.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0

Duration:	1	1	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	1	0	1
Probability:	2	1	1
Total SP:	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• No leaked oil or fuel tankers may contaminate soil • All tanks and pipes containing fuel or oil must be inspected on a regular basis • Spills outside the bund area must be treated with a spill kit • All significant leaks must be reported to the competent authority in terms of NEMA • UST must be fitted with leak detectors in order to alert when a leak is occurring. • Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices. • Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher • A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions. • All personnel working with fuel must undergo spill kit training • Following a leak or accidental spill, a remediation plan must be compiled and executed. • Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.		

Potential Soil Erosion Impacts:			
Nature of impact: Increased Soil erosion due to operational activities.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	4	2	0
Duration:	1	1	1
Extent:	2	1	1
Irreplaceable:	2	1	1
Reversibility:	1	1	1
Probability:	2	1	1
Total SP:	20	6	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)

Proposed Mitigation:	• During the operational phase, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated, • All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line, • Temporary cut off drains may be required to capture storm water and promote infiltration, • All storm water management features must be constructed in a manner that will ensure the continued functioning of the emergent vegetation. Construction must coincide with the dry season.

Potential Visual Impacts:

Nature of impact: Increased visual impact due to increased working activities during the operational phase.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0
Duration:	1	1	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	1	0	1
Probability:	2	1	1
Total SP:	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• All waste must be placed in bins during operational phase. Keeping the area litter free. • Construction activities may only take place during normal working hours.		

Potential Socio-Economic Impacts:

Nature of impact: Increased socio-economic conditions due to job creation			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	6	8	8
Duration:	1	1	1
Extent:	2	2	2
Irreplaceable:	2	2	2
Reversibility:	2	2	2

Probability:	4	5	4
Total SP:	52	75	60
Significance rating:	+ Medium (M)	+ Medium-high (MH)	Medium (M)
Cumulative impact:	+ Medium (M)	+ Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure that low-, medium- and high skilled workers use provided working opportunities. • Low-, medium- and high skilled workers must be sourced locally. • Were practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities. • Individuals must be trained and continuously developed		

DECOMMISION PHASE			
Potential Dust Impacts:			
Nature of impact: Dust nuisance generated during the decommissioning phase of the project.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	6	4	2
Duration:	1	1	2
Extent:	2	2	1
Irreplaceable:	1	1	1
Reversibility:	2	1	2
Probability:	2	2	2
Total SP:	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Dust Management measures must be implemented in order to manage and minimize undesired dust emissions. • Access roads and pivot areas to be decommissioned are to be ripped and seeded for vegetation regrowth to avoid dust. • Pivots need to be rehabilitated by planting buffalo grass.		
Potential Surface and Groundwater Contamination Impacts:			
Nature of impact: Surface and Groundwater Contamination during the decommissioning phase by means of fertilizer and/or any other hazardous substances or pesticides.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0
Duration:	1	1	1
Extent:	2	1	1
Irreplaceable:	1	1	1
Reversibility:	1	1	1
Probability:	1	1	1
Total SP:	7	4	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• When fertilisers / pesticides are used in the planting of seeds, ensure that all fertilisers / pesticides are environmentally friendly.		

	• When fertilisers / pesticides are used, only use the correct amount as indicated by the parcels. Do not over use. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages. • All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site. • Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary equipment and beneath all generators present on site.

Potential Waste Management Impacts:			
Nature of impact: Waste impacts by means of waste storage and littering during the decommissions phase of the pivots.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	2	2
Duration:	1	1	2
Extent:	1	1	1
Irreplaceable:	1	1	1
Reversibility:	1	1	2
Probability:	1	1	2
Total SP:	6	6	16
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited. • Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle. • Keep all work sites including storage areas, offices and workshops neat and tidy. • All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site. • Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised. • The burning and burying of solid waste on site is prohibited. • Littering by workers shall not be permitted. • General waste shall be removed from site to an approved landfill site.		

Potential Soil Contamination Impacts:	
Nature of impact: Increased Soil contamination by means of hazardous substances.	**Activity:**

			Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	2	0	0
Duration:	1	1	1
Extent:	2	1	1
Irreplaceable:	1	1	1
Reversibility:	1	1	1
Probability:	1	1	1
Total SP:	7	4	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• No leaked oil or fuel tankers may contaminate soil • Spills outside the bund area must be treated with a spill kit • All significant leaks must be reported to the competent authority in terms of NEMA • Following a leak or accidental spill, a remediation plan must be compiled and executed.		
Potential Soil Erosion Impacts:			
Nature of impact: Increased Soil erosion due to decommissioning activities.			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	6	4	0
Duration:	2	2	1
Extent:	1	1	1
Irreplaceable:	2	1	1
Reversibility:	2	1	1
Probability:	2	1	1
Total SP:	26	9	4
Significance rating:	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)
Proposed Mitigation:	• During the decommissioning phase, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into		

	the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated, • All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line, • Temporary cut off drains may be required to capture storm water and promote infiltration,		
Potential Socio-Economic Impacts:			
Nature of impact: Increased socio-economic conditions due to job loss			**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	
Magnitude:	6	4	6
Duration:	3	2	1
Extent:	3	3	2
Irreplaceable:	2	1	2
Reversibility:	2	2	2
Probability:	2	2	4
Total SP:	32	24	52
Significance rating:	Low (L)	Low (L)	+ Medium (M)
Cumulative impact:	Low (L)	Low (L)	+ Medium (M)
Proposed Mitigation:	• Ensure that low-, medium- and high skilled workers working at the farm are given advance notice in terms of the decommissioning. • Assist Low-, medium- and high skilled worker in finding other possible vacancies.		