

Appendix 3:
Impact Assessment

Potential Impact	Aspect	Type and Nature of Impact	Significance If not mitigated					Mitigation Measures	Significance if mitigated						
			Extent (E)	Duration (D)	Severity (S)	Consequence (C) = E+D+S	Probability (P)		Significance (CXP)	Extent (E)	Duration (D)	Severity (S)	Consequence (C) = E+D+S	Probability (P)	Significance (CXP)
Core Drilling															
Cracks and disruption to geological layers	Geology	Direct Negative	2	5	6	(13)	4	Medium (52)	Plan location of invasive prospecting sites properly to avoid geological features. Start with fewer boreholes to verify non-invasive prospecting followed by more extensive drilling in areas indicating adequate resources.	1	5	4	(10)	4	Medium (40)
Hydrocarbon contamination of soils	Soils	Direct Negative	1	3	4	(8)	4	Low (32)	Remove any spills as soon as it occurs along with the polluted soil and dispose of it at a registered waste site. Follow the equipment's operation and maintenance procedures and all vehicles must undergo periodic maintenance and inspection. Equip vehicles on site with drip trays and place drip trays under leaky equipment. Spill kits must be available on site and personnel trained to utilize these to clear spills immediately.	1	1	4	(6)	2	Very low (12)
Harm/disturbance to protected fauna and flora species	Fauna and Flora	Direct Negative	2	3	6	(11)	4	Medium (44)	Plan location of drill sites properly to avoid sensitive features such as water courses and rocky outcrops. Survey prospecting sites in areas with natural vegetation for any protected species known to occur in the region and either keep species in situ with 50m buffer zone to prevent inadvertent damage to these species or obtain permits to remove / destroy protected species. Do not hinder, harm, or trap animals.	2	3	4	(9)	2	Very low (12)
Disturbance to streams and wetlands if activity proceeds indiscriminately	Surface water and aquatic ecosystems	Direct Negative	3	4	8	(15)	3	Medium (45)	No prospecting activities can take place within 100m of streams and/or 500m of wetlands unless authorisation is obtained to do so. Plan drill sites properly to avoid watercourses.	2	4	8	(14)	2	Low (28)
Hydrocarbon contamination of surface water through contaminated runoff		Direct Negative	3	4	8	(15)	3	Medium (45)	Remove any spills as soon as it occurs along with the polluted soil and dispose of it at a registered waste site.	2	4	8	(14)	2	Low (28)
Cracks and disruption to aquifers	Groundwater	Direct Negative	3	5	10	(18)	3	Medium (54)	Start with fewer boreholes to verify non-invasive prospecting followed by more extensive drilling in areas indicating adequate resources. Limit development to target rocks and reduce exposure of aquifer rocks.	3	5	10	(18)	2	Low (36)
Potential hydrocarbon and chemical contamination of groundwater resources		Direct Negative	3	4	8	(15)	3	Medium (45)	Remove any spills as soon as it occurs along with the polluted soil and dispose of it at a registered waste site. Use percussion drilling to drill through the clay and just before the rift switch over to diamond drilling to avoid the use of chemicals.	3	4	8	(15)	2	Low (30)
Irresponsible use of water and water wastage		Cumulative Negative	2	3	6	(11)	3	Low (33)	Recycle water from the sumps to re-use on the rig. Source water from existing lawful water use or water service provider. Use clean water responsibly.	2	3	6	(11)	2	Low (22)

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									Investigate whether other drilling methods (i.e., air flush – does not use water for drilling) is feasible.						
Emissions into the atmosphere through use of diesel-powered equipment, machinery, and vehicles	Air quality	Cumulative Negative	3	3	4	(10)	5	Medium (50)	Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment.	2	3	4	(9)	4	Low (36)
Increase in ambient noise levels	Noise	Cumulative Negative	2	3	4	(9)	5	Medium (45)	Drilling must be done in consultation with the landowners to ensure that work schedules are communicated to them. Prospecting activities must be conducted during normal working hours (Monday – Friday - 7am – 17pm) Implement noise control measures on noisy equipment.	1	3	4	(8)	4	Low (32)
Visual intrusion and disturbance to the sense of place	Visual	Direct Negative	2	3	4	(9)	4	Low (36)	Keep disturbed areas as small as possible. Keep the drill site neat, clean, and organised in order to maintain a tidy appearance. Remove waste off site as soon as possible or place it in closed bins in order to keep the site free from additional unsightly elements.	1	3	4	(8)	2	Very low (16)
Damage or destruction of any heritage resources	Heritage	Direct Negative	1	5	8	(14)	3	Medium (42)	Establish a 50m buffer/safety zone around graves. Implement the Chance Find Protocol during the planning process to help establish the exact locations of the boreholes.	1	5	8	(14)	2	Low (28)
Creation of employment opportunities	Socio Economic	Direct Positive	3	3	4	(10)	3	Low (30) +	Appoint local contractors where possible.	3	3	4	(10)	4	Medium (40) +
Establishment of drill site and temporary contractors' yard															
Compaction of soils	Soils	Direct Negative	1	3	4	(8)	4	Low (32)	Keep disturbed area as small as possible. Rip compacted soils.	1	3	4	(8)	3	Low (24)
Temporary change in land use	Land use	Direct Negative	2	4	4	(10)	3	Low (30)	Keep the disturbed area as small as possible.	1	4	4	(9)	2	Very low (18)
Disturbance/damage to vegetation and subsequent disturbance to animal species	Flora Fauna	Direct Negative	1	3	6	(10)	4	Medium (40)	Plan location of drill sites properly to avoid sensitive features such as watercourses and rocky outcrops. Restrict vegetation clearance. Remove vegetation during periods of low rainfall or dry periods. Relocate protected plant species for which permits are obtained rather than destroying species.	1	3	4	(8)	3	Low (24)
Increase in dust fall out	Air quality	Cumulative Negative	2	3	4	(9)	5	Medium (45)	Dust suppression procedures should be implemented to reduce and control dust on the drill site.	1	3	4	(8)	3	Low (24)
Increase in ambient noise levels	Noise	Cumulative Negative	2	3	4	(9)	5	Medium (45)	Drilling must be done in consultation with the landowners to ensure that work schedules are communicated to them. Prospecting activities must be conducted during normal working hours	1	3	4	(8)	3	Low (24)

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									(Monday – Friday - 7am – 17pm) Implement noise control measures on noisy equipment.						
Visual intrusion and disturbance to the sense of place	Visual	Direct Negative	2	3	4	(9)	4	Low (36)	Keep disturbed areas as small as possible. Keep the drill site neat, clean, and organised in order to maintain a tidy appearance. Remove waste off site as soon as possible or place it in closed bins in order to keep the site free from additional unsightly elements.	1	3	4	(8)	2	Very low (16)
Damage or destruction of any heritage resources	Heritage	Direct Negative	1	5	8	(14)	3	Medium (42)	Establish a 50m buffer/safety zone around graves. Implement the Chance Find Protocol during the planning process to help establish the exact locations of the boreholes.	1	5	8	(14)	2	Low (28)
Drill rig, machinery, and vehicle movement															
Compaction of soils	Soils	Direct Negative	1	3	6	(10)	4	Medium (40)	Remain in designated roads / routes / activity areas. Where not possible, routes must be properly planned to reduce disruption to soil as far as possible.	1	3	4	(8)	3	Low (24)
Hydrocarbon contamination of soils		Direct Negative	1	3	6	(10)	4	Medium (40)	Follow the equipment's operation and maintenance procedures and all vehicles must undergo periodic maintenance and inspection.	1	3	6	(10)	3	Low (30)
Harm/disturbance to protected fauna and flora species	Flora and Fauna	Direct Negative	1	3	6	(10)	4	Medium (40)	Survey any off-road routes for any protected species known to occur in the region and either keep species in situ with 50m buffer zone to prevent inadvertent damage to these species or obtain permits to remove / destroy protected species. Remain in designated roads as far as possible.	1	3	6	(10)	2	Low (20)
Disturbance to streams and wetlands if activity proceeds indiscriminately	Surface water and aquatic ecosystems	Direct Negative	1	4	6	(11)	3	Low (33)	No prospecting activities can take place within 100m of streams and/or 500m of wetlands unless authorisation is obtained to do so.	1	4	6	(11)	2	Low (22)
Hydrocarbon contamination of surface water through contaminated runoff		Direct Negative	2	4	6	(12)	3	Low (36)	Follow the equipment's operation and maintenance procedures and all vehicles must undergo periodic maintenance and inspection.	1	4	6	(11)	2	Low (22)
Potential hydrocarbon contamination seeping to the groundwater environment		Groundwater	Direct Negative	1	4	6	(11)	3	Low (33)	Leaky vehicles will not be parked over bare ground; where unavoidable, drip trays will be placed under the equipment to collect leaks. The leaky vehicles will be discontinued until repairs are made.	1	4	6	(11)	2
Emissions into the atmosphere through use of diesel-powered equipment, machinery, and vehicles	Air quality	Cumulative Negative	3	3	4	(10)	5	Medium (50)	Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment.	2	3	4	(9)	4	Low (36)
Increase in dust fall out		Cumulative Negative	2	3	4	(9)	5	Medium (45)	Dust suppression procedures should be implemented to reduce and control dust on the access road and drill site. Control the speed of operational vehicles. The drill rig must remain on site as far as possible.	2	3	4	(9)	3	Low (27)
Increase in ambient noise levels	Noise	Cumulative Negative	2	3	4	(9)	5	Medium (45)	Drilling must be done in consultation with the landowners to ensure that work schedules are communicated to them. Prospecting activities must be conducted during normal working hours	2	3	4	(9)	4	Low (36)

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									(Monday – Friday - 7am – 17pm). Implement noise control measures on noisy equipment. Establish a 50m buffer/safety zone around graves.						
Damage or destruction of any heritage resources	Heritage	Direct Negative	1	5	8	(14)	3	Medium (42)	Implement the Chance Find Protocol during the planning process to help establish the exact locations of the boreholes.	1	5	8	(14)	2	Low (28)
Damage to existing infrastructure incl. gates, roads, and fences	Socio economic, health and safety	Direct Negative	2	3	8	(13)	4	Medium (52)	Remain in designated roads /routes. If infrastructure were damaged by the drill team the Applicant must repair the damages (i.e., grade farm roads that have been damaged due to use by prospecting team). The drilling team must always close the farm gates after entering.	1	3	6	(10)	2	Low (20)
Increase potential for road accidents		Direct Negative	2	3	8	(13)	3	Low (39)	The drilling contractor's personnel will always adhere to the speed limit. No transporting will occur after sunset. Vehicles will be in roadworthy condition with reflective strips to make them clean and visible for other road users. Intersections with main tarred roads will be clearly signposted.	2	3	8	(13)	1	Very low (13)
Water Management															
Loss of soil resource due to erosion	Soils	Indirect Negative	1	3	6	(10)	3	Low (30)	Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary. Effective managing of the topsoil by covering or reseeded the stockpiles to avoid erosion. Any erosion gullies must be remediated immediately.	1	3	6	(10)	2	Low (20)
Potential contamination of surface water resources with process water from the sumps	Surface water and aquatic ecosystems	Direct Negative	2	4	6	(12)	3	Low (36)	Use biodegradable lubricants and fluids/polymers. Maintain buffer zones around watercourses as ecological corridors and refuges.	2	4	6	(12)	2	Low (24)
Potential contamination of groundwater through process water seepage	Groundwater	Direct Negative	2	4	6	(12)	4	Medium (48)	Line sumps with the appropriate lining system. Isolate porous or highly transmissive groundwater zones through capping or grouting to prevent clean groundwater ingress or recharge of contaminated water.	2	4	6	(12)	2	Low (24)
Storage and Handling of Dangerous goods															
Hydrocarbon contamination of soils	Soils	Direct Negative	1	3	6	(10)	4	Medium (40)	Equip vehicles on site with drip trays and place drip trays under leaky equipment.	1	3	6	(10)	3	Low (24)
Hydrocarbon contamination of surface water through contaminated runoff	Surface water and aquatic ecosystems	Direct Negative	2	4	6	(12)	3	Low (36)	Spill kits must be available on site in the event of a spillage.	2	4	6	(12)	2	Low (24)
Potential hydrocarbon contamination seeping to the groundwater environment	Groundwater	Direct Negative	2	4	6	(12)	4	Medium (48)	Adhere to safe work procedure when refuelling vehicles and machinery. Hydrocarbons must be stored within portable bund tanks.	2	4	6	(12)	2	Low (24)

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Ablution Facilities															
Potential contamination of soils and groundwater with sewage	Soils Groundwater	Direct Negative	1	3	4	(8)	4	Low (32)	Inspect, repair, and replace any damaged toilets. Appoint the necessary reputable contractor to manage portable toilets. Implement proper housekeeping and hygienic practices.	1	3	4	(8)	2	Very low (16)
Potential contamination of surface water with sewage	Surface water and aquatic ecosystems	Cumulative Negative	2	4	6	(12)	3	Low (36)	Maintain buffer zones around watercourses as ecological corridors and refuges. Inspect, repair, and replace any damaged toilets. The portable toilets must be managed by a reputable contractor, emptied on a regular basis as needed. Toilets must be maintained in hygienic state.	2	4	6	(12)	1	Very low (12)
Domestic Waste Management															
Potential contamination of soils with indiscriminately dumped waste or littering	Soils	Direct Negative	1	3	4	(8)	4	Low (32)	Domestic waste must be collected in waste bins that are located on site. The waste bins must be marked clearly indicating what waste must be disposed of in what bin.	1	3	4	(8)	2	Very low (16)
Potential contamination of surface water with indiscriminately dumped waste or littering	Surface water and aquatic ecosystems	Direct Negative	2	4	6	(12)	3	Low (36)	Employees must be encouraged to re-use, recycle, and reduce waste where possible.	2	4	6	(12)	2	Very low (12)
Potential contamination of groundwater with indiscriminately dumped waste or littering	Groundwater	Direct Negative	2	4	6	(12)	3	Low (36)	No burning of domestic waste may be done on site. Appoint reputable contractors for the removal and disposal of general waste at a licensed facility.	2	4	6	(12)	2	Low (24)
Rehabilitation of boreholes															
Localised dips in topography if boreholes collapse after material is replaced	Topography	Residual Negative	1	5	8	(14)	3	Medium (42)	Inspect and take immediate action to repair any dips by levelling and grading the disturbed area.	1	5	8	(14)	2	Low (28)
Soil replacement and re-vegetation of disturbed areas	Soils	Direct Positive	1	5	6	(12)	3	Low (36) +	Rehabilitation must be on-going as soon as drilling results are completed. Replaced soil should be vegetated as soon as possible, where required, to prevent erosion and establishment of weed species. Soil compaction should be avoided as far as possible but where not compacted soils must be ripped to correct any compaction.	1	5	6	(12)	4	Medium (48) +
Permanent change of land use back to pre-drilled state	Land use	Residual Positive	1	5	6	(12)	4	Medium (48) +	No mitigation necessary – impact is positive.	1	5	6	(12)	4	Medium (48) +
Alien plant infestation	Flora	Residual Negative	1	5	6	(12)	4	Medium (48)	Remove alien and invasive species that may establish around prospecting sites. Clear all vehicles coming to site of any vegetative material.	1	5	6	(12)	2	Low (24)
Improvement of visual quality and sense of place	Visual	Residual Positive	1	5	4	(10)	3	Low (30) +	Rehabilitation must be on-going as soon as drilling results are completed.	1	5	4	(10)	4	Medium (40) +

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Influx of people into the area															
Theft and safety risk resulting in the decrease in quality of life	Socio economic, health and safety	Indirect Negative	2	3	6	(11)	3	Low (33)	<p>Ensure farm gates are always closed.</p> <p>No employee will be allowed to loiter around farms.</p> <p>The drill contractor must monitor the whereabouts of the drill team.</p>	2	3	6	(11)	2	Low (22)
Increase risk of veld fires	Socio economic, health and safety	Indirect Negative	2	3	6	(11)	3	Low (33)	<p>No employees will be allowed to make any open fires on the farms or adjacent land.</p> <p>Cigarette butts may not be thrown in the veld, but must be disposed of correctly.</p> <p>Contractors must ensure that basic fire-fighting equipment and suitably qualified/experienced personal are always available on site.</p> <p>Fire extinguishers shall be placed at working areas and all areas where hazardous substances are kept.</p> <p>The drilling contractor must liaise with the local Fire Protection Agency (FPA) before drilling commences.</p>	1	3	6	(10)	2	Low (20)